Masters in Economics

Past years and Sample exams

2019 – 2024

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Updated: June 3, 2026

Contents

IITJAM 2021

Question 1

When the expected future marginal product of capital increases, then the IS curve

A. shifts up and to the right

B. shifts down and to the left

C. becomes steeper

D. becomes flatter

Question 2

An unanticipated inflation would cause

A. redistribution of wealth from lenders to borrowers

B. redistribution of wealth from borrowers to lenders

C. gains for both borrowers and lenders

D. losses for both borrowers and lenders

Question 3

Let $\{x_1, x_2, \cdots, x_n\}$ be the realization of a randomly drawn sample of size n with sample mean $\bar{x}$, and k be a real number other than $\bar{x}$. Let S_1 and S_2 be the sums of squared deviations defined as

$$S_1 = \sum_{i=1}^{n} (x_i - \bar{x})^2 \quad \text{and} \quad S_2 = \sum_{i=1}^{n} (x_i - k)^2 .$$

Then,

A. $S_1 > S_2$

B. $S_1 > S_2$ only if $\bar{x} < k$

C. $S_1 < S_2$

D. $S_1 > S_2$ only if $\bar{x} > k$

Question 4

You have a budget of Rs. 4000 and would like to purchase LPG cylinders from a local seller who charges Rs. 50 per cylinder. The seller has a subsidy scheme by which if you return the empty cylinder purchased from him, you will get a refund of Rs. 20 per cylinder. You cannot borrow money from anyone. The maximum number of cylinders you can purchase is

A. 131

B. 132

C. 133

D. 134

Question 5

Which one of the following is NOT a feature of the New Industrial Policy, 1991?

A. Abolition of industrial licensing

B. Privatisation of public industries

C. Removal of restrictions on foreign trade

D. Restrictions on foreign technology agreements

Question 6

Which one of the following is a possible reason for underestimation of the official poverty ratio in India?

A. Changes in the World Bank's definition of poverty

B. Price indices used in the official poverty estimation may not be adequately capturing the actual increase in the cost of living over the years

C. Existence of identical poverty lines for all the states and union territories

D. Existence of identical poverty lines for rural and urban areas

Question 7

Which one of the following committees is NOT associated with financial sector reforms in India?

A. Raghuram Rajan Committee (2013)

B. Narasimham Committee (1991)

C. Tarapore Committee (1997)

D. Urjit Patel Committee (2013)

Question 8

The differential equation $\left(3x^2y + y^3\right)dx + \left(x^3 + 3xy^2\right)dy = 0$ is

A. homogeneous and exact

B. neither separable nor exact

C. exact and not homogeneous

D. homogeneous and not exact

Question 9

Which one of the following statements is correct?

A. If $\langle a_n \rangle$ is a bounded sequence, then it is convergent

B. If $\langle a_n \rangle$ is a convergent sequence, then it is monotonic

C. If $\langle a_n \rangle$ is a convergent sequence and converges to zero, then the series $\sum_{n=1}^{\infty} a_n$ is convergent

D. If a series $\sum_{n=1}^{\infty} a_n$ is convergent, then the sequence $\langle a_n \rangle$ is convergent and converges to zero

Question 10

Let $\|.\|$ and $\langle .,. \rangle$ denote the standard norm and inner product in $\mathbb{R}^n$, respectively. If $u, v \in \mathbb{R}^3$ such that $\|u\| = \|v\| = 2$ and the angle between u and v is $\pi/3$ then

A. $\|u - v\| = 2\sqrt{2}$

B. $\langle u, v \rangle = 2\sqrt{3}$

C. $\|u - v\| = 2\sqrt{3}$

D. $\|u + v\| = 2\sqrt{3}$

Question 11

A monopoly canteen serves packed meals to two groups of consumers, group X and group Y. The demand for packed meals for X and Y are given by, $Q_X = 200 - 4P$ and $Q_Y = 300 - P$ where P is the uniform price per unit. The unit cost of producing each meal is Rs. 50. The value of P (in Rs.) that maximizes

A. 75

B. 50

C. 125

D. 175

Question 12

Consider a Solow growth model without technological progress. The production function is

$$Y_t = K_t^{\alpha} N_t^{1-\alpha}$$

where Y_t, K_t and N_t are the aggregate output, capital and population at time t, respectively. The population grows at a constant rate of $g_N > 0$, savings rate is constant at $s \in (0, 1)$ and capital depreciates at a constant rate of $\delta \geq 0$. Denote per capita capital as

$$k_t = K_t / N_t$$

and define the steady state as a situation where $k_{t+1} \ominus k_t = k_s^*$ where k^* is a positive constant. Suppose the population growth rate exogehously increases to g_N'. At the new steady state, the aggregate output will grow at a rate

A. g_N

B. g_N'

C. $(1 - \alpha) g_N$

D. $(1 - \alpha) g_N'$

Question 13

The utility from wealth (w) for an individual is given by $u(w) = \sqrt{w}$. The individual owns a risky asset that is equally likely to yield either Rs. 400 or Rs. 900. The risk premium of the asset (in Rs.) is

A. 5

B. 25

C. 625

D. 650

Question 14

Let $\widehat{\alpha_1}$ and $\widehat{\alpha_2}$ be two independent unbiased estimators of the parameter α with standard errors σ_1 and σ_2, respectively, with $\sigma_1 \neq \sigma_2$. The linear combination of $\widehat{\alpha_1}$ and $\widehat{\alpha_2}$ that yields an unbiased estimator of α with the minimum variance is

A. $\left(\frac{\sigma_1}{\sigma_1+\sigma_2}\right)\widehat{\alpha_1} + \left(\frac{\sigma_2}{\sigma_1+\sigma_2}\right)\widehat{\alpha_2}$

B. $\left(\frac{\sigma_2}{\sigma_1+\sigma_2}\right)\widehat{\alpha_1} + \left(\frac{\sigma_1}{\sigma_1+\sigma_2}\right)\widehat{\alpha_2}$

C. $\left(\frac{\sigma_1^2}{\sigma_1^2+\sigma_2^2}\right)\widehat{\alpha_1} + \left(\frac{\sigma_2^2}{\sigma_1^2+\sigma_2^2}\right)\widehat{\alpha_2}$

D. $\left(\frac{\sigma_2^2}{\sigma_1^2+\sigma_2^2}\right)\widehat{\alpha_1} + \left(\frac{\sigma_1^2}{\sigma_1^2+\sigma_2^2}\right)\widehat{\alpha_2}$

Question 15

Let X be a uniformly distributed random variable in $[0, b]$. If the critical region for testing the null hypothesis $H_0 : b = 2$ against the alternative hypothesis $H_A : b \neq 2$ is $\{x \leq 0.1 \text{ or } x \geq 1.9\}$, where x is the value of a single draw of the random variable X, then the probability of Type-I error is

A. 0.2

B. 0.1

C. 0.05

D. 0.01

Question 16

Let X be a uniformly distributed random variable in $[a, b]$. The values of an independently drawn sample of size five from X are given by $\{1.3, 0.8, 9.5, 20.2, 8.2\}$. Let $\hat{a}$ and $\hat{b}$ denote the Maximum Likelihood Estimates for the parameters a and b, respectively. Then,

A. $\hat{a} = 0.8; \hat{b} = 20.2$

B. $\hat{a} = 1.3; \hat{b} = 9.5$

C. $\hat{a} = 1.3; \quad \hat{b} = 8.2$

D. $\hat{a} = 0; \hat{b} = 21$

Question 17

There are only two firms in an industry producing a homogenous product and having identical production technology. The cost function of firm i is

$$C_i(q_i) = q_i^2, \text{ for } i = 1, 2$$

where q_i is the quantity produced by firm i. The market demand for the product is $p = 100 - q$, where p is the unit price and $q = q_1 + q_2$ is the aggregate quantity. Assuming the firms are price takers, the competitive equilibrium solution of p and q in this market

A. $p = 80, q = 20$

B. $p = 20, q = 80$

C. $p = \frac{200}{3}, q = \frac{100}{3}$

D. $p = 50, q = 50$

Question 18

An upstream paper mill dumps effluents in a river. The total benefit and total cost to the mill are $TB = 120Q - Q^2$ and $TC = 20Q$, respectively, where Q is the amount of output it produces. The environmental cost due to the negative externality is $EC = Q^2$. The government wants to impose a production tax of t per unit of output on the mill. The value of t to achieve the socially optimal level of production is

A. 6

B. 25

C. 50

D. 70

Question 19

Which one of the following statements is NOT correct regarding changes in the occupational structure of the workforce between 1951 and 1991 in India?

A. Proportion of cultivators has increased

B. Proportion of agriculture labour has increased

C. Proportion of those employed in the tertiary sector has increased

D. Proportion of those employed in the primary sector has decreased

Question 20

Let W be a subspace of the vector space $\mathbb{R}^3$ over the field $\mathbb{R}$ spanned by $\begin{pmatrix} 0 \\ -1 \\ 2 \end{pmatrix}$ and $\begin{pmatrix} 2 \\ -1 \\ 0 \end{pmatrix}$. Which one of the following vectors lies in W ?

A. $\begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix}$

B. $\begin{pmatrix} -1 \\ 1 \\ 1 \end{pmatrix}$

C. $\begin{pmatrix} 1 \\ -1 \\ 1 \end{pmatrix}$

D. $\begin{pmatrix} 1 \\ 1 \\ -1 \end{pmatrix}$

Question 21

Let $f, g : \mathbb{R} \to \mathbb{R}$ be defined by

$$f(x) = xe^{-x} \text{ and } g(x) = x|x|$$

Then, on $\mathbb{R}$,

A. both f and g are convex

B. f is convex and g is not convex

C. f is not quasiconvex and g is quasiconvex

D. neither f nor g is quasiconvex

Question 22

Let $\left(x_1^* = 1, x_2^* = 0, x_3^* = 2\right)$ be an optimal solution of the linear programming problem

$$\begin{aligned} &\text{minimize} x_1 + 5x_2 + 2x_3 \\ &\text{subject to } x_1 - x_2 \leq 1 \\ &\qquad x_1 + x_2 + x_3 \geq 3 \\ &\qquad x_1, x_2, x_3 \geq 0. \end{aligned}$$

If $\left(\lambda_1^*, \lambda_2^*\right)$ is an optimal solution of its dual, then

A. $2\lambda_1^* = 3\lambda_2^*$

B. $2\lambda_1^* = \lambda_2^*$

C. $\lambda_1^* = 2\lambda_2^*$

D. $\lambda_1^* = \lambda_2^*$

Question 23

Let X and Y be two independent random variables with the cumulative distribution functions

$$F_X(x) = 1 - \left(\tfrac{3}{4}\right)^x, \quad x = 1, 2, 3, \cdots$$
$$G_Y(y) = 1 - \left(\tfrac{2}{3}\right)^y, \quad y = 1, 2, 3, \cdots$$

respectively. Let $Z = \min\{X, Y\}$. Then, the probability $P(Z \geq 6)$ is

A. $\frac{1}{64}$

B. $\frac{1}{32}$

C. $\frac{63}{64}$

D. $\frac{31}{32}$

Question 24

Let X and Y be two random variables with the joint probability density function

$$f_{X,Y}(x, y) = \begin{cases} 6xy & \text{if } 0 < y \leq \sqrt{x} \leq 1 \\ 0 & \text{otherwise.} \end{cases}$$

Then, the conditional probability $P\left(Y \geq \frac{1}{3} \mid X = \frac{2}{3}\right)$ is

A. $\frac{1}{2}$

B. $\frac{5}{9}$

C. $\frac{5}{6}$

D. $\frac{3}{4}$

Question 25

Which one of the following statements is NOT correct in the context of economic planning in India?

A. In the investment strategy for the Second Five Year Plan, a high priority was accorded to the development of heavy capital goods industries over light industries

B. The sectoral allocation to industry was the highest in the First Five Year Plan

C. Plan Holiday for three years was declared after the Third Five Year Plan

D. In each of the first ten Five Year Plan periods, the average incremental capital-output ratio (ICOR) did not exceed 10%

Question 26

For any two sets $S_1, S_2 \subset \mathbb{R}$, define the set $S_1 - S_2 = \{x \in S_1, x \notin S_2\}$. Let $P = \left\{x \in \mathbb{R} : x^2 - 2x - 3 \leq 0\right\}$ and $Q = \left\{x \in \mathbb{R} : \log_5 \left(1 + x^2\right) \leq 1\right\}$ Then,

A. $P - Q = [2, 3]$

B. $Q - P = (1, 2]$

C. $P - Q = [-3, -2)$

D. $Q - P = [-2, -1)$

Question 27

The workforce participation rate of a country is 60%. This country has a population of 100 million of which 6 million are unemployed. The unemployment rate for this country is

A. $\frac{2}{11}$

B. $\frac{2}{11}$

C. $\frac{3}{50}$

D. $\frac{1}{10}$

Question 28

According to John Maynard Keynes, which one of the following statements is correct for a closed economy operating at less than the full employment level of output?

A. Savings determines investment

B. Investment determines savings

C. Changes in the money supply have no impact on output

D. Speculative demand for money is determined by the output level

Question 29

A monopolist is facing a downward sloping linear market demand. His variable cost of production is zero. The profit maximizing price will

A. lie in the strictly inelastic region of the demand curve

B. lie in the strictly elastic region of the demand curve

C. be at the unitary elastic point of the demand curve

D. be equal to the marginal cost of production

Question 30

X pays Rs. 5 lakhs to a person to transport fake currency worth Rs. 50 lakhs. The Police department pays Rs. 5 lakhs to a detective to investigate the crime. The detective's income is taxed at 10%. If the above transactions happen in the same year and within the boundary of a country, the contribution of these transactions to GDP (in Rs. lakhs) is

A. 5.5

B. 5

C. 10

D. 4.5

Question 31

An amateur singer has just recorded his first music album with a recording company. The demand for his album is given by $Q = 40000 - 800P$, where e Q is the number of albums sold and P is the price of each album. Furthermore, per unit cost of producing each album is given by Rs. 8. A profit máximizing recording company has offered the following (i) 20% of the revenue from the (ii) Rs. 2 per album sold (iii) A fixed fee of Rs. 32,000 Which of the following is/are correct?

A. Contract (i) yields the highest payment to the singer

B. Contract (ii) yields the highest payment to the singer

C. Contract (iii) yields the highest payment to the singer

D. Contract (ii) and (iii) yield the same payment to the singer

Question 32

There are two firms in an oligopolistic industry competing in prices and selling a homogenous product. Total cost of production for firm i is

$$C_i\left(q_i\right) = 10q_i, \quad i = 1, 2$$

where q_i is the quantity produced by firm i. Suppose firm i sets price p_i and firm j sets price p_j. The market demand faced by firm i is given by $q_i\left(p_i, p_j\right) = \begin{cases} 100 - p_i; & \text{if} \quad p_i < p_j \\ 0; & \text{if} \quad p_i > p_j \\ \frac{100-p_i}{2}; & \text{if} \quad p_i = \hat{p}_j \end{cases}$ for all $i, j = 1, 2$ and $i \neq j$. Price can only take integer values in this market. Nash equilibrium/equilibria is/are given by

A. $p_1 = 10, \quad p_2 = 10$

B. $p_1 = 12, \quad p_2 = 12$

C. $p_1 = 40, \quad p_2 = 40$

D. $p_1 = 11, \quad p_2 = 11$

Question 33

Which of the following statements is/are correct about the Indian economy during the colonial period?

A. The average annual growth of per capita income was lower during the period $1920-25$ to 1947 than the period 1865 to $1920-25$.

B. The colonial administration generated a large amount of revenue from peasants by raising the land revenue.

C. The British brought capital from England for the construction of Railways and passed on the burden of interest on it to the Indian tax payers.

D. Dadabhai Naoroji's estimates of the drain of wealth front India to England included, among other things, the home charges.

Question 34

In the context of Expectations Augmented Phillips Curve (EAPC), which of the following statements is/are correct?

A. An increase in the natural rate of unemployment shifts EAPC to the left.

B. An increase in the expected inflation shifts EAPC up and to the right.

C. If actual unemployment rate equals the natural rate of unemployment, the unanticipated inflation equals zero.

D. As long as actual unemployment rate exceeds the natural rate of unemployment, the actual inflation rate exceeds the expected inflation.

Question 35

Let f be a function defined on $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$ as

$$f(x) = \frac{\cos\left(\frac{\pi}{2} + |x|\right)}{\sin\left(\frac{\pi}{2} - |x|\right)}$$

Then,

A. f is not continuous at $x = 0$

B. f is continuous but not differentiable at $x = 0$

C. $\lim_{x \to 0^+} \frac{f(x)-f(0)}{x} = -1$

D. $f'(0) = -1$

Question 36

Let $x, y \in \mathbb{R}$ and the matrix

$$M = \begin{bmatrix} x+y & x-y \\ x-y & x+y \end{bmatrix}$$

Also, let adj(M) be the adjoint and det(M) be the determinant of the matrix M If $M \begin{bmatrix} 3 \\ 1 \end{bmatrix} = \begin{bmatrix} -1 \\ 3 \end{bmatrix}$, then

A. $x + y = -\frac{3}{4}$

B. $x - y = \frac{3}{4}$

C. $\det(M) = -1$

D. $\det(\text{adj}(M)) = 1$

Question 37

The net inflow of foreign currency into a country on current account and capital account combined is negative in a particular year. The country could be following a fixed or a flexible exchange rate regime. Which of the following scenarios is/are possible for the country's economy in that year?

A. The country's foreign exchange reserves may increase

B. The country's exchange rate may appreciate

C. The country's foreign exchange reserves may decrease

D. The country's exchange rate may depreciate

Question 38

Let $k \in \mathbb{R}$. Which of the following statements is/are correct for the roots of the quadratic equation

$$x^2 + 2(k+1)x + 9k - 5 = 0$$

A. If $k \leq 1$, then the roots are real and positive

B. If $2 \leq k \leq 4$, then the roots are complex

C. If $4 < k < 6$, then the roots are real and opposite in sign

D. If $k \geq 6$, then the roots are real and negative

Question 39

If the number of employed workers in a country increases while its population does not change, then the unemployment rate in the country

A. will always increase

B. will always decrease

C. may increase

D. may decrease

Question 40

There are two sellers, H and L, in a second-hand goods market where product quality varies. The sellers know the quality of their own product but the buyers cannot distinguish the product quality without further information. Sellers' valuation of their own product is based on the quality. H is willing to sell his product with quality Q_H at a price P_H per unit and L is willing to sell the product with quality Q_L at a price P_L per unit such that $Q_H > Q_L$ and $P_H > P_L$ This market will suffer from

A. adverse selection

B. moral hazard

C. market failure

D. excess supply

Question 41

The amount of money a gambler can win in a casino is determined by three independent rolls of a six-faced fair dice. The gambler wins Rs. 800 if he gets three sixes, Rs. 400 if he gets two sixes, and Rs. 100 in the event of getting only one six. The gambler does not win or lose any money in all other possible, outcomes. The probability that a gambler will win at least Rs. 108° is _____. (round off to 2 decimal places)

Question 42

Consider an economy where the full employment eutput is 1 trillion Rupees and the natural rate of unemployment is 6%. If actual unemployment rate is 8%, then according to Okun's law, the absolute gap between the full employment output and actual output (in billion Rupees) will be _____. (in integer)

Question 43

The values of normalized indices for a country are as follows.

Dimension	Value of normalized index
Standard of living	0.4
Education	0.2
Health	0.8

Following the current UNDP methodology, the value of Human Development Index (HDI) for the country is _____. (round off to 1 decimal place)

Question 44

The value of the integral

$$\int_0^9 \frac{x-1}{1+\sqrt{x}}dx$$

is _____. (in integer)

Question 45

Consider the first order difference equation

$$x_n = \left(\frac{n+1}{n}\right) x_{n-1}, \quad n = 1, 2, 3, \ldots$$

If $x_0 = 2$, then $x_{100} - x_{50}$ equals _____. (in integer)

Question 46

In a small open economy, the desired domestic savings $\left(S^d\right)$ and the desired domestic investment $\left(I^d\right)$ are as follows, where r^w is the world real interest rate.

$$S^d = 10 + 100r^w$$

$$I^d = 15 - 100r^w$$

the current account balance in the equilibrium would be _____. (in integer)

Question 47

Let $X_1 \sim N\left(\mu_1, \sigma_1^2\right)$ and $X_2 \sim N\left(\mu_2, \sigma_2^2\right)$ be two normally distributed random variables, where $\mu_1 = 2, \mu_2 = 3$ and $\sigma_1^2 = 4, \sigma_2^2 = 9$. The correlation coefficient between them is 0.5. The variance of the random variable $(X_1 + X_2)$ is _____. (in integer)

Question 48

A consumer always spends 50% of his monthly income on food. Introduction θ(? value added tax on food items has led to a 20% increase in food prices while his monthly income remained unchanged. The consumer's price elasticity of demand for food is _____. (in integer)

Question 49

The utility function of a consumer from consumption of x_1 and x_2 is given by

$$u\left(x_1, x_2\right) = x_1 + 2\sqrt{x_2}$$

At the current prices and income, the consumer's optimal consumption bundle is given by $(x_1 = 10, x_2 = 10)$. The consumer's optimal choice of x_2, if his income increases by 50% but prices remain unchanged, is _____. (in integer)

Question 50

The following data relate to a country's GDP in 2012-13 (in local currency).

Item	Value
GDP	59,816
Private sector investment	17,811
Exports	14,498
Investment expenditure by the government	5,087
Net Factor Income from Abroad	125
Consumption expenditure by the government	6,620
Private sector consumption	35,695

The value of this country's imports (in local currency) in $2012 - 13$ is _____. (in integer)

Question 51

Amar has an endowment of food $F_A = 2$ and water $W_A = 5$. Barun has an endowment of food $F_B = 8$ and water $W_B = 5$. Amar's utility function is given by

$$U_A\left(f_A, w_A\right) = f_A^2 w_A$$

where f_A and w_A are his consumption of food and water, respectively. Barun's utility function is given by

$$U_b\left(f_B, w_B\right) = \min\{f_B, w_B\}$$

where f_B and w_B are his consumption of food and water respectively. They exchange food and water at prices p_f and p_y, respectively, to maximize their utilities. In the competitive equilibrium, $\frac{p_f}{p_w}$ equals _____ (in integer)

Question 52

The supply and demand curves of a vaccine are

$$q = 14 + 5p \text{ and } q = 329 - 5p$$

respectively, where p is price per unit of vaccine and q is quantity of vaccine. The government decides that the maximum price of the vaccine would be Rs. 25 per unit. To avoid any shortage in supply at the ceiling price, the government also decides to subsidize the sellers so that the market clears. Subsidy is given on per unit basis. The total expenditure of the government in providing the subsidy is Rs. _____ (in integer)

Question 53

A firm has two manufacturing plants, 1 and 2 to produce the same product. The total costs of production are given by

$$TC_1 = 500 + 30Q_1 \text{ and } TC_2 = 1500 + 20Q_2$$

in plants 1 and 2 , respectively, where Q_1 and Q_2 are the respective quantities? The demand for the product is given by $Q^d = 150 - \frac{P}{3}$, where P is the price per unit. The value of Q_1 that maximizes the profit of the firm is _____ (in integer)

Question 54

Let $y(x) > 0$ be a solution of the differential equation

$$\frac{dy}{dx} + y = y^2$$

If $y(\ln 2) = \frac{1}{3}$, where ln denotes the natural logarithmic function, then $y(\ln 3)$ equals _____. (round off to 2 decimal places)

Question 55

The optimal yalue of the constrained optimization problem minimize $2xy$ subject to $9x^2 + 4y^2 \leq 36$ is _____. (in integer)

Question 56

For some $\beta > 0$, let the variables x_1 and x_3 be the optimal basic feasible solution of the linear programming problem

$$\begin{array}{ll} \text{maximize} & x_1 + 2x_2 + 3x_3 \\ \text{subject to} & 2x_1 - x_2 + x_3 = 9 \\ & x_1 + 2x_2 - \beta x_3 = 1 \\ x_1, x_2, x_3 & \geq 0. \end{array}$$

If the optimal value is 7 , then β equals _____.

Question 57

Let X_1, X_2, X_3, X_4 be independent random variables following the standard normal distribution. Let Y be defined as, $Y = (X_1 + X_2)^2 + (X_3 + X_4)^2$. Then the variance of Y equals _____. (in integer)

Question 58

The aggregate production function for a country is, $Y = 10N - 0.005N^2$, where N is the quantity of labor input. The aggregate labor supply function is $N = 55 + 5w$, where w is the real wage rate. Assuming perfectly competitive labor and product markets, the equilibrium real wage is _____. (in integer)

Question 59

Individuals in a country start earning and consuming at the age of 18 years, retire at the age of 60 years and die at the age of 90 years, without leaving any debt and bequests. The income of an individual at age t (in years) is given by the expression $100t - t^2$. The price level is constant and the interest rate is zero. According to the life cycle theory of consumption, the average annual consumption of an individual is _____. (in integer)

Question 60

The IS-LM model for a closed economy is given below, where Y is the output, C is the consumption, I is the investment, T is the income tax, M^d is the money demand, P is the price level, r is the real interest rate, π^e is expected inflation rate and G is the government expenditure.

$$C = 200 + 0.8(Y - T) - 500r$$
$$I = 200 - 500r$$
$$T = 20 + 0.25Y$$
$$\frac{M^d}{P} = 0.5Y - 250\,(r + \pi^e)$$

If $G = 196$, $\pi^e = 0.1$, the nominal money supply gquals 9890 and the full employment output equals 1000 , the full employment equilibrium price level in the economy is _____. (in integer)

IITJAM 2022

Question 1

When the supply curve S_x is backward bending and the demand curve D_x is downward sloping as shown in the figure, there are two equilibria M and N, respectively. Which of the following statements is CORRECT?

A. Only M is stable equilibrium

B. Only N is stable equilibrium

C. Both M and N are stable equilibria

D. Both M and N are unstable equilibria

Question 2

Which of the following deficits indicates the true current fiscal position of the Indian Economy?

A. Revenue Deficit

B. Capital Deficit

C. Current Account Deficit

D. Primary Deficit

Question 3

Which of the following CORRECTLY defines the relationship between the variances of sample means for simple random samples drawn with and without replacement from a normal population?

A. $\frac{\sigma^2}{n} > \frac{\sigma^2}{n}\left(\frac{N-n}{N-1}\right)$

B. $\frac{\sigma^2}{n} \leq \frac{\sigma^2}{n}\left(\frac{N-n}{N-1}\right)$

C. $\frac{\sigma^2}{n} < \frac{\sigma^2}{n}\left(\frac{N-n}{N-1}\right)$

D. $\frac{\sigma^2}{n} = \frac{\sigma^2}{n}\left(\frac{N-n}{N-1}\right)$

Question 4

Suppose that one million unemployed persons in a country are receiving Rs. 6000 per month per person as an unemployment allowance. If the government, instead of paying unemployment allowance, hires all of them at the same amount (Rs. 6000 per month per person) and engages them in digging the pits and filling the same pits. What will be the effect on GDP?

A. No effect on GDP

B. GDP will rise.

C. GDP will fall.

D. The effect on GDP will be uncertain.

Question 5

Which amendments to the constitution have provided constitutional status to the rural and urban local bodies in India?

A. 80^{th} and 81^{st} Amendments

B. 73^{rd} and 74^{th} Amendments

C. 92^{nd} and 93^{rd} Amendments

D. 71^{st} and 72^{nd} Amendments

Question 6

Let W be a subspace of a vector space $\Re^3$. Then, which of the following sets of vectors forms a basis of W?

A. $(1, 2, 1)$ and $(1, -2, 5)$

B. $(1, 3, 2), (1, -1, 0), (4, -1, 0)$ and $(3, 1, -3)$

C. $(1, 1, 1), (1, 2, 3)$ and $(2, -1, 1)$

D. $(1, -2, 1), (2, 1, -1)$ and $(7, -4, 1)$

Question 7

From the following, who first examined the close negative relationship between the unemployment rate and the output ratio?

A. Alban W. Phillips

B. James Tobin

C. Arthur M. Okun

D. Robert M. Solow

Question 8

In the hypothesis testing, which of the following defines the size of power of the test?

A. 1 - (Probability of accepting null hypothesis when it is true)

B. 1− (Probability of rejecting null hypothesis when it is true)

C. 1 - (Probability of accepting null hypothesis when it is false)

D. 1+ (Probability of rejecting null hypothesis when it is not true)

Question 9

Which of the following is NOT a postulate of the Classical Model of full-employment equilibrium?

A. Wage-Price flexibility

B. Perfect information about the market

C. Consumption and saving functions depend on income.

D. The price level moves proportionately with the quantity of money.

Question 10

A long-run cost function for a product exhibits economies of scale if

A. average cost of production increases when the output increases.

B. the production function has decreasing returns to scale.

C. average cost of production falls as the output increases.

D. average cost of production remains constant as the output increases.

Question 11

Let $x^3 + 3y^2 = 4$ for all $x, y \in \mathbf{R}$, $y' = \frac{dy}{dx}$ and $y'' = \frac{d^2y}{dx^2}$. Then

A. $x^2 + yy'' + \left(y'\right)^2 = 0$

B. $2x + y'' + 2\left(y'\right)^2 = 0$

C. $x + \left(y'\right)^2 = 0$

D. $x + yy'' + \left(y'\right)^2 = 0$

Question 12

Match List I with List II and choose the CORRECT option.

List I	List II
a. Second Five Year Plan (1956-61)	i. Towards Faster and More Inclusive Growth
b. Fourth Five Year Plan (1969-74)	ii. Removal of Poverty and Attainment of Self-reliance
c. Fifth Five Year Plan (1974-79)	iii. Rapid Industrialization-Heavy and Basic Industries
d. Eleventh Five Year Plan (2007-12)	iv. Family Planning Programmes

A. (a, ii), (b, i), (c, iv), (d, iii)

B. (a, iii), (b, iv), (c, i), (d, ii)

C. (a, iv), (b, iii), (c, ii), (d, i)

D. (a, iii), (b, iv), (c, ii), (d, i)

Question 13

Let $f : [0, \infty) \to \mathbf{R}$ be a function defined by $f(x) = \frac{x+1}{x+2}$ for all $x \in \mathbf{R}$. Then f is

A. one-one and onto.

B. one-one but not onto.

C. onto but not one-one.

D. neither one-one nor onto.

Question 14

An economy is characterized by the Solow model, with the production function $y = \sqrt{k}$, where y is output per worker and k is capital per worker. The steady-state level of output per worker is $y^{ss} = A^{1/(1-\alpha)} \left(\frac{\gamma}{\delta}\right)^{\alpha/(1-\alpha)}$, where A, γ, δ and α denote productivity, share of output invested (in %), depreciation rate (in %) and capital's share in income (in fraction), respectively. Suppose that $A = 1$, $k = 400$, $\gamma = 50\%$, $\delta = 5\%$ and $\alpha = 1/2$. Then the current output, using the above information, is

A. above the steady-state level of output per worker.

B. at the steady-state level of output per worker.

C. below the steady-state level of output per worker.

D. at the Golden Rule level.

Question 15

Which of the following is NOT related to the structural adjustment programmes implemented in India after 1991?

A. Deregulation

B. Quantitative restrictions on trade

C. Fiscal austerity

D. Reduction of subsidies

Question 16

Let a second order difference equation be

$$y_{n+2} + 4y_n = 4y_{n+1}, n = 2, 3, 4, \ldots, y_0 = 1, y_1 = 4.$$

A. $\left(1 + n^2\right) 2^n$

B. $(1 + n)2^n$

C. $\left(1 + \frac{1}{n}\right) 2^n$

D. $\left(n^2 + n + 1\right) 2^n$

Question 17

Suppose that two random samples of sizes n_1 and n_2 are selected without replacement from two binomial populations with means $\mu_1 = n_1 p_1, \mu_2 = n_2 p_2$ and variances $\sigma_1^2 = n_1 p_1 q_1, \quad \sigma_2^2 = n_2 p_2 q_2$, respectively. Let the difference of sample proportions $\bar{P}_1$ and $\bar{P}_2$ approximate a normal distribution with mean $\left(p_1 - p_2\right)$. Then the standard deviation of the difference of sample proportions $\bar{P}_1$ and $\bar{P}_2$ is

A. $\sqrt{\left(\frac{p_1 q_1}{n_1}\right)\left(\frac{N_1 - n_1}{N_1 - 1}\right) + \left(\frac{p_2 q_2}{n_2}\right)\left(\frac{N_2 - n_2}{N_2 - 1}\right)}$

B. $\sqrt{\left(\frac{p_1 q_1}{n_1}\right) + \left(\frac{p_2 q_2}{n_2}\right)}$

C. $\sqrt{\left(\frac{p_1 q_1 - p_2 q_2}{n_1 + n_2}\right)}$

D. $\sqrt{\left(\frac{p_1 q_1}{n_1 + n_2}\right)\left(\frac{N_1 - n_1}{N_1 - 1}\right) + \left(\frac{p_2 q_2}{n_1 + n_2}\right)\left(\frac{N_2 - n_2}{N_2 - 1}\right)}$

Question 18

Which of the following statements is NOT correct in the context of quantity theory of money?

A. The quantity of money available determines the price level in the economy.

B. The growth rate in the quantity of money available determines the inflation rate in the economy.

C. The velocity of money must rise with the increase in the quantity of money in the economy.

D. The economy's output is determined by factor supplies and technology, because money is neutral.

Question 19

Let the function $f : \Re^2 \to$ be $f(x, y) = \frac{xy^2}{x^3+2x^2y+y^3}$, $f(0, 0) = 0$. Then

A. f is differentiable at $(0, 0)$.

B. f_x does not exist at $(0, 0)$.

C. f_y does not exist at $(0, 0)$.

D. f is not continuous at $(0, 0)$.

Question 20

Which of the following measures was announced by the Government of India in the year 1994?

A. Full convertibility on capital account

B. Full convertibility on current account

C. Constitution of the Narasimham Committee on banking sector reforms

D. Constitution of the Abid Hussain Committee on trade policies

Question 21

An analyst at the Green Car Co. Ltd. estimated the following demand function for the electric vehicles it sells:

$$Q_E = 0.75 - 1.5P_E + 2.5P_F - 0.5P_B + 3.2I$$

where Q_E = Number of electric vehicles (in thousand per year), P_E = Unit price of electric vehicle (Rs. in Lakh), P_F = Average unit price of vehicle using fossil fuels (Rs. in Lakh), P_B = Unit price of battery used in electric vehicle (Rs. in Lakh), I = Personal disposable income (Rs. in Lakh).

Let P_E = Rs. 6.5Lakh, P_F = Rs. 4.5Lakh, P_B = Rs. 0.5Lakh and I = Rs. 10 Lakh. Then the income elasticity of demand $\left(e_{Q_E I}\right)$ and the cross price elasticity of demand $\left(e_{Q_E P_F}\right)$ satisfy

A. $0.98 \leq e_{Q_E I} \leq 0.99$ and $0.33 \leq e_{Q_E P_F} \leq 0.34$

B. $0.94 \leq e_{Q_E I} \leq 0.95$ and $0.45 \leq e_{Q_E P_F} \leq 0.46$

C. $0.98 \leq e_{Q_E I} \leq 0.99$ and $0.45 \leq e_{Q_E P_F} \leq 0.46$

D. $0.94 \leq e_{Q_E I} \leq 0.95$ and $0.33 \leq e_{Q_E P_F} \leq 0.34$

Question 22

Choose the option that represents the original linear programming problem based on the initial simplex tableau given below, where S_i represents slack/surplus variables and A_i represents the artificial variables corresponding to the i^{th} constraint:

C_j			15	25	0	$-M$	$-M$	0
	X_b	b	x	y	S_1	A_1	A_2	S_3
$-M$	A_1	20	7	6	-1	1	0	0
$-M$	A_2	18	3	-2	0	0	1	0
0	S_3	30	8	5	0	0	0	1
	Z_j	$-38M$	$-10M$	$-4M$	M	$-M$	$-M$	0
	$C_j - Z_j$		$15 + 10M$	$25 + 4M$	$-M$	0	0	0

A. Minimize $Z = 15x + 25y$ subject to $7x + 6y \geq 20, 3x - 2y \leq 18, 8x + 5y \leq 30; x, y \geq 0$.

B. Maximize $Z = 15x + 25y$ subject to $7x + 6y \geq 20, 3x - 2y = 18, 8x + 5y \leq 30; x, y \geq 0$.

C. Minimize $Z = 15x + 25y$ subject to $7x + 6y \geq 20, 3x - 2y = 18, 8x + 5y \geq 30; x, y \geq 0$.

D. Maximize $Z = 15x + 25y$ subject to $7x + 6y = 20, 3x - 2y = 18, 8x + 5y \leq 30; x, y \geq 0$.

Question 23

Let a production function be given by $\log Q = \frac{\beta}{\alpha} \log (L^\alpha + K^\alpha)$, where $\alpha \in (-\infty, 1] - \{0\}$ and $\beta > 0$ Then identify the statement that is NOT correct.

A. The ratio β/α helps in identification of returns to scale factors.

B. For $\beta > 1$, the function exhibits increasing returns to scale, and for $\beta < 1$, it shows decreasing returns to scale.

C. The elasticity of substitution is $\frac{1}{1-\alpha}$.

D. The elasticity of substitution is $\frac{1}{1-\beta}$.

Question 24

Which of the following statements is NOT correct under the IS-LM (Fixed Price) model?

A. The LM curve represents the combinations of income and interest rate, where money market is in equilibrium.

B. The IS curve represents the combinations of income and interest rate, where product market (goods and services) is in equilibrium.

C. An increase in money supply raises income and reduces interest rate when the IS curve has negative slope and the LM curve has positive slope.

D. Monetary policy has a relatively weak effect on income when the interest responsiveness of the demand for money is relatively low.

Question 25

The probability of getting head in a toss of a biased coin is $\frac{2}{3}$. Let the coin be tossed

three times independently. Then the probability of getting head in the first two tosses and tail in the final toss is

A. $\frac{4}{27}$

B. $\frac{1}{8}$

C. $\frac{2}{27}$

D. $\frac{23}{27}$

Question 26

Consider a pure exchange economy with two goods x and y. Ravi and Suraj are two individuals with utility functions $U_R = \beta \log(xy)$ and $U_S = \left(\frac{x}{y}\right)^{\alpha}$, respectively. The endowments are x_R and y_R for Ravi and x_S and y_S for Suraj such that $x_R + x_S = A$ and $y_R + y_S = B$. Then their contract curve is

A. $Ay_R - Bx_R = 0$

B. $Ay_R + Bx_R - 2y_R x_R = 0$

C. $Ay_R + Bx_R - y_R x_R = 0$

D. $Ay_R - Bx_R + 2y_R x_R = 0$

Question 27

Which of the following is NOT correct regarding R-squared (R^2) and Adjusted R-squared $(\bar{R}^2)$?

A. R^2 is a scale invariant statistic.

B. $\bar{R}^2$ is always positive.

C. R^2 tends to increase if we add an additional explanatory variable.

D. $\bar{R}^2 = 1 - (1 - R^2)\left(\frac{n-1}{n-k}\right)$, where k is the number of parameters and n is the number of observations.

Question 28

The technical change in the endogenous growth model is endogenized by

A. providing incentives to firms to innovate.

B. making the saving function dependent on income.

C. introducing constraints in capital accumulation.

D. assuming a perfectly competitive market structure.

Question 29

Which of the following statements is CORRECT for Game A and Game B?

A. In Game **A**, (Movie, Football) and (Football, Movie) represent Nash equilibrium. In Game **B**, (Do not confess, Do not confess) is the Nash Equilibrium.

B. In Game **B**, (Confess, Confess) is not a Nash equilibrium but in Game **A**, both (Movie, Football) and (Football, Movie) represent Nash equilibrium.

C. In Game B, the Nash equilibrium is (Do not confess, Do not confess).

D. In Game **A**, both (Movie, Movie) and (Football, Football) represent Nash equilibrium. In Game **B**, the Nash equilibrium is (Confess, Confess).

Question 30

The short-run production function of a firm is $Q = 200 + 0.2L^2 - 0.0004L^3$. If wage rate equals Rs. 140 and the number of labours (L) is 100, then the Marginal Cost and the Average Variable Cost, respectively, are

A. 5 and 7.78

B. 6 and 7.78

C. 5 and 6.68

D. 6 and 6.68

Question 31

Let $X \sim N\left(\mu_X, \sigma_X^2\right)$ and $Y \sim N\left(\mu_Y, \sigma_Y^2\right)$. Which of the following is/are NOT correct?

A. The area $F(X) = \frac{1}{\sigma_X\sqrt{2\pi}} \int_{-\infty}^{\mu_X} e^{-\frac{1}{2}\left(\frac{X-\mu_X}{\sigma_X}\right)^2} dx$ is 1 .

B. The areas under the normal probability curve between the ordinates at $\mu_X \pm 3\sigma_X$ and $\mu_Y \pm 2\sigma_Y$ are 0.9544 and 0.9973, respectively.

C. For variable X, Quartile Deviation : Mean Absolute Deviation : Standard Deviation $\cong \frac{2}{3}\sigma_X : \frac{4}{5}\sigma_X : \sigma_X$

D. If X and Y are independent, then $(X - Y) \sim N\left(\mu_X - \mu_Y, \sigma_X^2 + \sigma_Y^2\right)$.

Question 32

Matching List I and List II, choose the CORRECT option(s).

List I	List II
a. Bombay Plan	i. J. P. Narayan
b. People's Plan	ii. J. R. D. Tata
c. Sarvodaya Plan	iii. M. N. Roy

A. (a, i), (b, iii)

B. (a, ii), (b, iii)

C. (b, iii), (c, i)

D. (a, ii), (c, iii)

Question 33

Suppose that the regression model is $Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \mu_i, i = 1, 2, \ldots, n$. Which of the following null hypotheses could be tested using the F-test?

A. $\beta_1/\beta_2 = 0$

B. $\beta_0 = 0$

C. $\beta_1\beta_2 = 0$

D. $\beta_1 = \beta_2 = 0$

Question 34

Let f be defined by $f(x) = |x| + \left|\cos\left(\frac{\pi}{2} - x\right)\right|, x \in \left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$. Then

A. f is continuous on $\left(-\frac{\pi}{2}, 0\right) \cup \left(0, \frac{\pi}{2}\right)$.

B. f is differentiable at $x = 0$.

C. f is differentiable everywhere except $x = 0$.

D. $\lim_{x \to 0} f(x) = 0$.

Question 35

The real exchange rate is given by $e = EP/P^{\star}$, where e is the price of domestic goods in terms of foreign goods, E is the price of domestic currency in terms of foreign currency, P is the domestic price level, $P^{\star}$ is the foreign price level. If the Indian Rupee depreciates vis-à-vis the Japanese Yen, and the Marshall-Lerner condition holds, then

A. India's imports will increase.

B. India's trade balance will improve.

C. foreign demand for Indian goods will increase.

D. foreign demand for Indian goods will decrease.

Question 36

The demand function $\left(Q_x^D\right)$ and supply function $\left(Q_x^S\right)$ are given as: $Q_x^D = f\left(P_x, I\right)$ and $Q_x^S = g\left(P_x, A\right)$ I (Income) and A (Advertisement expenses) are the exogenous factors affecting where I (Income) and A (Advertisement expenses) are the exogenous factors affecting quantity demanded and supplied, respectively. Further, $\frac{\partial f}{\partial P_x} < 0, \frac{\partial g}{\partial P_x} > 0$ but $\frac{\partial f}{\partial I}$ and $\frac{\partial g}{\partial A}$ may have any sign. Considering that there exists an equilibrium $\left(Q_x^D = Q_x^S = Q\right)$, which of the following is/are CORRECT?

A. $e_{P_x A} = \left(\frac{\partial g}{\partial A}\frac{A}{Q}\right) / \left(\frac{\partial f}{\partial P_x}\frac{P_x}{Q} - \frac{\partial g}{\partial P_x}\frac{P_x}{Q}\right)$

B. $\frac{dP_x}{dA} = \left(\frac{\partial g}{\partial A}\right) / \left(\frac{\partial f}{\partial P_x} - \frac{\partial g}{\partial P_x}\right)$

C. $e_{P_x I} = \left(\frac{\partial g}{\partial I}\frac{I}{Q}\right) / \left(\frac{\partial f}{\partial P_x}\frac{P_x}{Q} - \frac{\partial g}{\partial P_x}\frac{P_x}{Q}\right)$

D. The sign of $\frac{dP_x}{dA}$ does not depend on $\frac{\partial g}{\partial A}$.

Question 37

Which of the following statements is/are CORRECT under the Keynesian Cross (Fixed Price) Model?

A. The product market and factor market independently determine the full-employment level of output.

B. Output is determined in the product market by the aggregate expenditure.

C. Money market determines the price level, given the quantity of money and the level of output.

D. Employment is determined in the factor market by the output level determined in the product market.

Question 38

Which of the following functions is/are homogeneous?

A. $x \cot^{-1}\left(\frac{y}{x}\right)$

B. $\sqrt{\frac{x}{y}} + \frac{3x}{y} + 7$

C. $\frac{x^3+y^3}{3x+4y}$

D. $3x^5y + 2x^2y^4 - 3x^3y^4$

Question 39

In the context of Indian agriculture, which of the following statements is/are CORRECT?

A. NABARD was established in 1982.

B. One of the objectives of setting up of the CACP was to ensure remunerative prices to farmers.

C. The APMC Act is related to institutional credit supply in agriculture.

D. The National Commission on Agriculture was chaired by V. M. Dandekar.

Question 40

Let a monopolist demand curve be given by $Q = P^e$, where Q is output, P is price, e is the price elasticity of demand ($e < -1$), and Marginal Cost = Average Cost = α, If P_C and P_M represent the price under perfect competition and monopoly, respectively, then which of the following is/are NOT correct? (CS_M and CS_C represent the consumer surplus under monopoly and perfect competition, respectively.)

A. $P_C = \alpha\left(\frac{e}{1+e}\right)$

B. $P_M = \alpha\left(\frac{e}{1+e}\right)$

C. For $e = -2$, $CS_M = CS_C$.

D. For e closer to -1, the ratio CS_M/CS_C increases.

Question 41

The sum of the eigen values of the square matrix $\begin{pmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{pmatrix}$ is _____ (in integer).

Question 42

Monthly per capita consumption expenditure (MPCE) of 10 households in a region is given below.

Households	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10
MPCE (in Rs.)	2800	3000	1200	3500	1400	2500	4000	1000	900	1300

Assuming the poverty cutoff (Z) of MPCE to be Rs. 2000 , the squared poverty gap ratio is _____ (round off to 3 decimal places).

Question 43

Suppose that the full employment level of output of an economy is Rs. 2200 million, expenditure determined level of output is Rs. 2163 million, and the marginal propensity to consume is 0.75. The deflationary gap equals Rs. _____ million (round off to 2 decimal places).

Question 44

Let $a, b \in \Re$. If $f(x) = ax + b$ is such that $a + b = 4$ and $f(x + y) = f(x) + f(y) - 2$ for all $x, y \in \Re$, then $\sum_{n=1}^{50} f(n) =$ _____

Question 45

The Total Variable Cost (TVC) for a firm is given by $TVC = x^3 - bx^2$. The Total Fixed Cost is 848. The value of b for which the Marginal Cost is minimum at $x = 16$ is _____ (in integer).

Question 46

Let the consumption function, tax function, and income identity be given by $C = C_0 + b(Y - T)$, $T = T_0 + tY$, and $Y = C + I_0 + G_0$, respectively, where C_0, I_0, G_0, and T_0 are autonomous consumption, investment, government expenditure, and tax, respectively. If $b = 0.75$ and $t = 0.1$, then an increase in G_0 by Rs. 20 million will increase Y by Rs. _____ million (round off to 2 decimal places).

Question 47

Let the system of equations be $\alpha u + w = 0, u + \alpha v = 0, v + \alpha w = 0$, where $\alpha \in \mathbf{R}$. Then the system has infinite solutions if $\alpha =$ _____ (in integer).

Question 48

Assume that the cost function for the i^{th} firm in an industry is given by

$$C_i = 0.25q_i^2 + 2q_i + 5, \quad i = 1, 2, \ldots, 150$$

where C_i and q_i are cost and output for the i^{th} firm, respectively. Let the aggregate inverse demand function be $P = 10 - 0.01Q$, where P is the unit price and Q is the aggregate output. Assuming perfect competition, the equilibrium quantity is _____(in integer).

Question 49

The following table presents the national income related aggregates (at current prices) for the year 2019-20:

National income related aggregates	Rs. Lakh Crores
Net factor income earned abroad	10
Private income	175
GNP at factor cost	210
NNP at factor cost	195
Retained earnings of Nation's private sector	10
Corporate tax	25
Household direct tax	28
Personal income	140
Miscellaneous receipts of government administrative departments	0

The personal disposable income for the year 2019-20 is Rs. Lakh Crores _____ (in integer).

Question 50

The following table provides a list of countries selling Big Mac and market exchange rates in January 2019.

Country	Big Mac (Price in local currency)	Market Exchange Rate (Local currency per US
United States	5.58 USD	1.00
Norway	50.00 Kroner	8.53 Kroner/USD
Japan	390.00 Yen	108.44 Yen/USD
Mexico	49.00 Pesos	17.31 Pesos/USD
China	20.90 Yuan	6.85 Yuan/USD
Russia	110.17 Rubles	66.69 Rubles/USD
India	178.00 Rupees	69.69 Rupees/USD

Using the above information, the cheapest price (in USD) of Big Mac is _____ (round off to 2 decimal places).

Question 51

An individual faces an uncertain prospect, where wealth could be Rs. 10 Lakh with probability 0.75 and Rs. 7 Lakh with probability 0.25.

Let the utility function be $U(w) = w^3$. Then the individual will buy full insurance by paying a premium of Rs. _____ Lakh (round off to 2 decimal places).

Question 52

Suppose that per capita GDP of India and USA are growing at annual average rates of 8.8% and 1.8%, respectively. Further, consider that in 2019 – 20, per capita GDP of USA was USD 41099 and per capita GDP of India was USD 1570. Assuming that the two countries continue to grow at the above rates, India's per capita GDP will be equal to the per capita GDP of USA in years _____ (round off to 2 decimal places).

Question 53

If $\int t \log\left(1+\frac{2}{t}\right) dt = g(t)\left(\frac{t^2-2}{2}-2\right) + f(t)\frac{t^2}{2} + Kt + C$, where C is an arbitrary constant, then $2K$ is _____ (in integer).

Question 54

ACD Bank holds a total deposit of Rs. 256412. To expand the money supply in the economy during the COVID-19 pandemic period, the Reserve Bank of India reduces the cash reserve ratio (CRR) from 4.5% to 3.5%. Due to this policy change, the additional money supply generated by ACD Bank is Rs. _____ (in integer).

Question 55

Suppose that the regression model is $Y_{n\times 1} = X_{n\times 3}\beta_{3\times 1} + U_{n\times 1}$ with $\beta_{3\times 1} = \begin{bmatrix} \beta_1 & \beta_2 & \beta_3 \end{bmatrix}^T$. A random sample of size $n = 23$ on Y and X is drawn from the normal population. Using the data, if a researcher obtains

$$\left(X^TX\right)^{-1} = \begin{bmatrix} 0.3 & 0.5 & 0.8 \\ 0.4 & -0.6 & 0.2 \\ 0.4 & 0.5 & 0.3 \end{bmatrix}, X^TY = \begin{bmatrix} 0.3 & 0.2 & 0.1 \end{bmatrix}^T \text{ and } e^Te = 0.7,$$ where e denotes the vector of estimated residuals, then the t-statistic to test the null hypothesis $\beta_3 = 0$ is _____

Question 56

Given the production function $Q = 6\sqrt{L}$ and the supply of labour $L = \sqrt{w}$, where L and w denote the number of labours and wage rate, respectively. If the unit price of the product is Rs. 243 , then the profit maximizing value of w is Rs. _____ (in integer).

Question 57

Given the following information related to product and money markets,

Product Market	Money Market
$C = 300 + 0.8(Y - T)$	$\frac{M_o}{P} = 0.4Y - 200i$
$T = 200 + 0.2(Y)$	$M_0 = 900; P = 1$ (Fix
$I_0 = 300; G_0 = 400$	

$Y =$ Income, $C =$ Consumption, $T =$ Tax, $I_0 =$ Autonomous Investment, $G_0 =$ Autonomous Government Expenditure, $M_0 =$ Nominal Money Demand, $P =$ Price, and $i =$ Interest Rate. The equilibrium level of interest rate (in %) is _____ (round off to 2 decimal places).

Question 58

Let the linear programming problem be $\begin{array}{ll} \text{Maximize} & Z = -0.2x_1 + x_2 \\ \text{subject to} & 2x_1 + 5x_2 \leq 70 \end{array}$ subject to $2x_1 + 5x_2 \leq 70$, $x_1 + x_2 \leq 20$, $x_1, x_2 \geq 0$. If $x_1 = a$ and $x_2 = b$ is the optimal solution, then $a + b =$ _____

Question 59

Let the production function be $Q = \sqrt{L^2 + K^2}$, the unit price of labour (L) and capital (K) be Rs. 30 and Rs. 40 , respectively, and the total cost be Rs. 580 . Then the maximum value of Q subject to the cost constraint is _____ (round off to 2 decimal places).

Question 60

In a market, two firms F_1 and F_2 are producing homogenous products. The inverse

demand function is given by $p = 120 - 0.5\left(q_1 + q_2\right)$, where p is the unit price of the product, and q_1 and q_2 are the outputs from F_1 and F_2, respectively. Suppose the cost functions of F_1 and F_2 are $C_1 = 20q_1$ and $C_2 = 10 + 0.5q_2^2$, respectively. Then the total profit earned by both the firms assuming a competitive situation is _____ (in integer).

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Question 1

A competitive firm can sell any output at price $P = 1$. Production depends on capital alone, and the production function $y = f(K)^\circ$ is twice continuously differentiable, with

$$f(0) = 0, f' > 0, f'' < 0, \lim_{K\to 0} f'(K) = \infty, \lim_{K\to\infty} f'(K) = 0$$

The firm has positive capital stock $\bar{K}$ to start with, and can buy and sell capital at price r per unit of capital. If the firm is maximizing profit then which of the following statements is NOT CORRECT?

A. If $\bar{K}$ is large enough, profit maximizing $y = 0$ and the profit is $r\bar{K}$

B. If $f'(\bar{K}) > r$, the firm will buy additional capital

C. If $f'(\bar{K}) < r$, the firm will sell some of its capital

D. If $f'(\bar{K}) = r$, the firm will neither buy nor sell any capital

Question 2

Let $f, g : \mathbb{R} \to \mathbb{R}$ be defined by

$$f(x) = \begin{cases} x+2, & x \le 1 \\ 2x+1, & x > 1 \end{cases} \quad \text{and} \quad g(x) = \begin{cases} 2x, & x \le 2 \\ x+2, & x > 2 \end{cases}$$

Then

A. f is convex and g is concave

B. f is concave and g is convex

C. both f and g are concaye

D. both f and g are convex

Question 3

Let S be a feasible set of a linear programming problem. If the dual problem of (P) is unbounded then

A. (P) is unbounded

B. S is empty

C. S is unbounded

D. (P) has multiple optimal solutions

Question 4

Which of the following is NOT CORRECT?

A. A quasiconcave function is necessarily a concave function

B. A concave function is necessarily a quasiconcave furiction

C. A quasiconcave function can also be a quasiconvex function

D. A quasiconcave function can alse be a convex function

Question 5

Among the following statements which one is CORRECT?

S1: $1x^2 + y^2 = 6$ is a level curve of

$$f(x, y) \Rightarrow \sqrt{x^2 + y^2} - x^2 - y^2 + 2$$

S2: $x^2 - y^2 = -3$ is a level curve of

$$g(x, y) = e^{-x^2} e^{y^2} + x^4 - 2 - 2x^2y^2 + y^4$$

A. both S1andS2

B. only S1

C. only S2

D. neither S1 nor S2

Question 6

Which of the following is NOT a component of Gross Domestic Product?

A. Investment

B. Rental Income

C. Transfer Payments

D. Wages and Salaries

Question 7

Which of the following are the direct instruments exercised by the Reserve Bank of India to control the money supply?

(i) Cash Reserve Ratio

(ii) Open Market Operations

(iii) Foreign Exchange Rate

(iv) Statutory Liquidity Ratio

A. (i, ii, iii)

B. (i, ii, iv)

C. (ii, iii, iv)

D. (i, iii, iv)

Question 8

Which of the following committees for the first time recommended for India

(i) use of implicit prices derived from quantity and value data collected in household consumer expenditure surveys for computing and updating the poverty lines

(ii) Mixed Reference Period (MRP) in estimating poverty lines

A. Y K Alagh Committee

B. D T Lakdawala Committee

C. S D Tendulkar Committee

D. C Rangarajan Committee

Question 9

Which of the following Five Year Plans focused on rapid industrialization heavy and basic industries, and advocated for a socialistic pattern of society as the goal of econowic policy?

A. 1^{st} Five Y Far Plan (1951-56)

B. 2^{nd} Five Year Plan ($1956-61$)

C. 3^{rd} Five Year Plan (1961-66)

D. 4^{th} Five Year Plan (1969-74)

Question 10

Let M and N be events defined on the sample space S. If $P(M)=\frac{1}{3}$ and $P\left(N^c\right)=\frac{1}{4}$ then which one of the following is necessarily CORRECT?

A. M and N are disjoint

B. M and N are not disjoint

C. M and N are independent

D. M and N are not independent

Question 11

Consider a 2-agent, 2-good exchange economy where agent i has a utility function $u_i\left(x_i, y_i\right)=\max\left\{x_i, y_i\right\}, i=1,2$. The initial endowments of goods X and Y that the agents have are $\left(\overline{x_1}, \overline{y_1}, \overline{x_2}, \overline{y_2}\right)=(25,5,5,5)$. Then select the CORRECT choice below where the price vector $\left(p_x, p_y\right)$ specified is part of a competitive equilibrium.

A. $\left(p_x, p_y\right)=(2,1)$

B. $\left(p_x, p_y\right)=(2,2)$

C. $\left(p_x, p_y\right)=(1,2)$

D. $\left(p_x, p_y\right)=(4,2)$

Question 12

For a firm operating in a perfectly competitive market which of the following statements is CORRECT?

A. Profit function is convex and homogeneous of degree in prices

B. Profit function is concave and homogeneous of degree 1 in prices

C. Profit function is convex but not homegeneous in prices

D. Profit function is neither concave nor convex in prices

Question 13

A firm is operating in a perfectly competitive environment. A change "insthe market condition leads to an increase in the firm's profit by an anmount K. Which of the following describes the change in the Producer's Surplus due to the above change in the market condition?

A. The Producer's surplus increases by K

B. The Producer's surplus increases by less than K but greater than 0

C. The Producer's surplus changes but it is not possible to know the direction of the change

D. The Producer's surplus doesn't change

Question 14

Two people, 1 and 2, are engaged in a joint project. Person $i \in \{1,2\}$ puts in effort $x_i\,(0 \leq x_i \leq 1)$, and incurs cost $C_i\,(x_i) = x_i$. The monetary outcome of the project is $4x_1x_2$ which is split equally between them. Considering the situation as a strategic game, the set of all Nash Equilibria in pure strategies is

A. $\{(0,0),(1,1)\}$

B. $\left\{(0,0),\left(\frac{1}{4},\frac{1}{4}\right),\left(\frac{1}{2},\frac{1}{2}\right),\left(\frac{3}{4},\frac{3}{4}\right),(1,1)\right\}$

C. $\left\{(0,0),\left(\frac{1}{2},\frac{1}{2}\right),(1,1)\right\}\}$

D. a null set

Question 15

Two firms, X and X are operating in a perfectly competitive market. The price elasticity of supply of X and Y are respectively 0.5 and 1.5. Then

A. if the market price increases by 1%, X supplies 0.5% less quantity

B. Y experiences a slower increase in marginal cost in comparison to X

C. if market price increases by 0.5%, X supplies 1% more quantity

D. Y experiences a rapid increase in marginal cost in comparison to X

Question 16

Let $y = y(x)$ be a solution curve of the differential equation

$$x\frac{dy}{dx} = y\ln\left(\frac{y}{x}\right), \quad y > x > 0$$

If $y(1) = e^2$ and $y(2) = \alpha$, then the value of $\frac{dy}{dx}$ at $(2,\alpha)$ is equal to

A. α

B. $\frac{\alpha}{2}$

C. 2α

D. $\frac{3\alpha}{2}$

Question 17

Let $2z = -3 = \frac{7}{3}i, i = \sqrt{-1}$. Then $2z^8$ is equal to

A. $-81(1)\sqrt{3}i)$

B. $81(-1+\sqrt{3}i)$

C. $81(\sqrt{3}+i)$

D. $9(-\sqrt{3}+i)$

Question 18

Let $a_n = \left(1+\frac{1}{n}\right)^{\frac{n}{2}}$ be the n^{th} term of the sequence $\langle a_n \rangle$, $n = 1, 2, 3, \ldots$.

Then which one of the following is NOT CORRECT?

A. $\langle a_n \rangle$ is bounded

B. $\langle a_n \rangle$ is increasing

C. $\sum_{n=1}^{\infty} \ln(a_n)$ is a convergent series

D. $\lim_{n\to\infty}\left(\frac{1}{n}\sum_{k=1}^{n} a_k\right) = \sqrt{e}$

Question 19

Consider a linear programming problem (P)

$$\begin{gathered}\min z = 4x_1 + 6x_2 + 6x_3 \\ \text{subject to} \\ x_1 + 3x_2 \geq 3 \\ x_1 + 2x_3 \geq 5 \\ x_1, x_2, x_3 \geq 0\end{gathered}$$

If $x^* = \left(x_1^*, x_2^*, x_3^*\right)$ is an optimal solution and z^* is an optimal value of (P) and $w^* = \left(w_1^*, w_2^*\right)$ is an optimal solution of the dual of (P) then

A. $x_2^* + x_3^* = w_1^* + w_2^*$

B. $z^* = 4\left(x_1^* + w_2^*\right)$

C. $z^* = 6\left(w_1^* + x_3^*\right)$

D. $x_1^* + x_3^* = w_1^* + w_2^*$

Question 20

For $\alpha, \beta \in \mathbb{R}$, consider the system of linear equations

$$\begin{aligned}x + y + z &= 1 \\ 3x + y + 2z &= 2 \\ 5x + \alpha y + \beta z &= 3\end{aligned}$$

Then

A. for every (α, β), $\alpha = \beta$, the system is consistent

B. there exists (α, β), satisfying $\alpha = 2\beta + 5 = 0$, for which the system has a unique solution

C. there exists a unique parr (α, β) for which the system thâsoinfinitely many solutions

D. for every (α, β), $\alpha \neq \beta$, satisfying $\alpha\tau^{2\beta} + 5 = 0$, the system has infinitely many solutions

Question 21

For a positively sloped LM curve, which of the following statements is CORRECT?

A. A decrease in the price level will shift the LM curve to the left

B. A lower nominal money supply wilt shift the LM curve to the right

C. An increase in the price levekwill shift the LM curve to the right

D. A higher nominal money supply will shift the LM curve to the right

Question 22

Consider an Economy that produces only Apples and Bananas. The following Table contains per unit price (in INR) and quantity (in kg) of these goods. Assuming 2010 as the Base Year and using GDP deflator to calculate the annual inflation rate, which of the following options is CORRECT?

Year	Price of Apple	Quantity of Apple	Price of Banana	Quantity of Banana
2010	1	100	2	50
2011	1	200	2	100
2012	2	200	4	100

A. GDP deflator for the year 2011 is 100 and the inflation rate for the year 2011 is 0%

B. GDP deflator for the year 2012 is 50 and the inflation rate for the year 2012 is 100%

C. 7 GDP deflator for the year 2011 is 50 and the inflation rate for the year 2011 is 0°

D. GDP deflator for the year 2012 is 100 and the inflation rate for the year 2012 is 100%

Question 23

Which of the following statements is NOT CORRECT in the context of an Open Economy IS-LM Model under Floating Exchange Rate (with fixed price) and Perfect Capital Mobility?

A. An expansionary fiscal policy would appreciate the domestic currency value

B. An expansionary monetary policy would depreciate the domestic currency value

C. Exchange rate has significant impact on determining the equilibrium level of income and employment

D. Monetary policy is fully effective in determining income and employment whereas fiscal policy is ineffective

Question 24

Among the following statements which one is CORRECT?

S1: Structural unemployment arises in between two jobs? the first job which an individual has quit in order to find the second job

S2: Frictional unemployment arises due to the mismatch of vacancies and skills of the individual

A. only S1

B. only S2

C. both S1 and S 2'

D. nèither S1 nor S2

Question 25

Matching List-I and List-II, choose the CORRECT option.

List-I	List-II
(a) Fiscal Deficit	(i) Difference between Government revenue expenditure and Government revenue receipts
(b) Revenue Deficit	(ii) Difference between Government total expenditure and Government total non-debt receipts minus interest payments
(c) Primary Deficit	(iii) Difference between Government total expenditure and Government total non-debt receipts

A. (a, iii), (b, ii), (c, i)

B. (a, iii), (b, i), (c, ii)

C. (a, i),(b, iii),(c, ii)

D. (a, ii),(b, i),(c, iii)

Question 26

A production function at time t is given by

$$Y_t = A_t K_t^{\alpha} L_t^{1-\alpha}, \quad \alpha \in (0,1), \quad \alpha \neq 0.5$$

where Y is output, K is capital, L is labour and A is the level of Total Factor Productivity. Define per capita output as $y_t \equiv \frac{Y_t}{\mathbb{P}_t}$ and capital-output ratio as $k_t \equiv \frac{K_t}{Y_t}$. For any variable x_t, denote $\frac{dx_t}{dt}$ bxo $\frac{\%}{x}$. The per capita output growth rate is

A. $\frac{\dot{y}}{y} = \frac{1}{(1-\alpha)}\frac{\dot{A}}{A} + \frac{\alpha}{(1-\alpha)}\frac{\dot{k}}{k}$

B. $\frac{\dot{y}}{y} = \frac{\alpha}{(1-\alpha)}\frac{\dot{A}}{A} + \frac{1}{(1-\alpha)}\frac{\dot{k}}{k}$

C. $\frac{\dot{y}}{2}(1-\alpha)\frac{\dot{A}}{A} + \alpha\frac{\dot{k}}{k}$

D. $\frac{\dot{y}}{y} = \alpha\frac{\dot{A}}{A} + (1-\alpha)\frac{\dot{k}}{k}$

Question 27

Matching List-I and List-II, choose the CORRECT option.

List-I (Regulatory and Supervisory Financial Institutions)	(Established as statutory bodies via Parliamentary Acts in year)
(a) Reserve Bank of India	(i) 2016
(b) Security and Exchange Board of India	(ii) 1934
(c) Insurance Regulatory Development Authority of India	(iii) 1992
(d) Insolvency and Bankruptcy Board of India	(iv) 1999

A. (a, ii), (b, iv), (c, iii), (d, i)

B. (a, iii), (b, ii), (c, iv), (d, i)

C. (a, ii), (b, iii), (c, i), (d, i)

D. (a, ii), (b, iii), (c, iv), (d, i)

Question 28

Let $X \sim \text{Normal}(0, 1)$ and $Y = |X|$. If the probability density function of Y is $f_Y(y)$ then for $y > 0$, $\sqrt{\frac{\pi}{2}} f_Y(y)$ is

A. $e^{-\frac{y^2}{2}}$

B. $e^{\frac{y^2}{2}}$

C. e^{-y^2}

D. $e^{-\frac{y}{2}}$

Question 29

Let the probability density function of the continuous random variable X be

$$f_X(x, \lambda) = \begin{cases} \lambda e^{-\lambda x}, & x \geq 0 \\ 0, & \text{otherwise} \end{cases}$$

where $\lambda > 0$ is a parameter. If the observed sample values of X are

$$x_1 = 1.75, \quad x_2 = 2.25, \quad x_3 = 2.50, \quad x_4 = 2.75, \quad x_5 = 3.25$$

then the Maximum Likelihood Estimator of λ is

A. $\frac{5}{2}$

B. $\frac{1}{5}$

C. $\frac{5}{12}$

D. $\frac{2}{5}$

Question 30

From a set comprising of 10 students, four girls $G_i, i = 1, \ldots, 4$, and six boys $B_j, j = 1, \ldots, 6$, a team of five students is to be formed. The probability that a randomly selected team comprises of 2 girls and 3 boys, with at least one of them to be B_1 or B_2, is equal to

A. $\frac{3}{7}$

B. $\frac{6}{7}$

C. $\frac{8}{21}$

D. $\frac{5}{21}$

Question 31

Suppose that the utility function $u : \mathbb{R}^n_+ \to \mathbb{R}_+$represents a complete, transitive and continuous preference relation over all bundles of n goods. Then select the choices below in which the function also represents the same preference relation.

A. $f(x_1, x_2, \ldots, x_n) = u(x_1, x_2, \ldots, x_n) + (u(x_1, x_2, \ldots, x_n))^3$

B. $g(x_1, x_2, \ldots, x_n) = u(x_1, x_2, \ldots, x_n) + \sum_{i=1}^n x_i$

C. $h(x_1, x_2, \ldots, x_n) = (u(x_1, x_2, \ldots, x_n))^{\frac{1}{n}}$

D. $m(x_1, x_2, \ldots, x_n) = u(x_1, x_2 \cdots, x_n) + \left(x_1^2 + x_2^2 + \cdots + x_n^2\right)^{0.5}$

Question 32

Consider a 2-agent, 2-good economy with an aggregate endowment of 30 units of good X and 10 units of good Y. Agent i has utility function

$$u_i(x_i, y_i) = \max\{x_i, y_i\}, i = 1, 2$$

Select the choices below in which the specified allocation of the goods to the agents is Pareto optimal for this economy

A. $(x_1, y_1, x_2, y_2) = (5, 5, 25, 5)$

B. $(x_1, y_1, x_2, y_2) = (10, 10, 20, 0)$

C. $(x_1, y_1, x_2, y_2) = (30, 0, 0, 10)$

D. $(x_1, y_1, x_2, y_2) = (0, 10, 30, 0)$

Question 33

In a 3-player game, player 1 can choose either Up or Down as strategies. Player 2 can chose either Left or Right as strategies. Player 3 can choose either Table 1 or Table 2 as strategies.

TABLE 1:

		Player 2	
~~Player 1~~		Left	Right
	Up	3, 2, 5	4, 1, 3
	Down	2, 6, 1	5, 4, 6

TABLE 2:

		Player 2	
Player 1		Left	Right
	Up	2, 3, 4	4, 5, 7
	Down	6, 4, 0	3, 3, 3

Which of the following strategy profile(s) is/are Nash Equilibrium?

A. (Up, Left, Table 1)

B. (Down, Right, Table 1)

C. (Down, Left, Table 2)

D. (Up, Right, Table 2)

Question 34

Let $f : \mathbb{R}^2 \to \mathbb{R}$ be the function defined by

$$f(x,y) = \begin{cases} \frac{x^2-y^3}{x^2+y^2}, & (x,y) \neq (0,0) \\ 0, & (x,y) = (0,0) \end{cases}$$

Then

A. f is not continuous at $(0,0)$

B. $f_x(0,0) = 0$

C. $f_y(0,0) = -1$

D. $f_x(0,0)$ does not, exists

Question 35

For $\alpha, \beta \in \mathbb{R}$, $\alpha \neq \beta$, if -2 and 5 are the eigenvalues of the matrix

$$M = \begin{bmatrix} 1-\alpha & 1+\beta \\ \beta & \alpha+\beta \end{bmatrix}$$

and $X = \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$ is an eigenvector of M associated to -2 , then

A. $2x_1 + x_2 = 0$

B. $\beta - \alpha = 5$

C. $\alpha^2 - \beta^2 = 5$

D. $x_1 + 3x_2 = 0$

Question 36

Which of the following statements is/are CORRECT in the context of the Absolute Income Hypothesis?

A. The marginal propensity to consume (MPC) is a constant

B. As income increases, the average propensity to consume (APC) tends to approach the marginal propensity to consume (MPC)

C. Average propensity to consume (APC) increases as income increases

D. Current saving/dis-saving has no bearing on future consumption

Question 37

Gross Domestic Product, at Factor Cost; GDP_M = Gross Doviestic Product at Market Price; $\sim h/P_F$ = Net National Product at Factor Cost; C = Consumption; I = Investment; G = Government Expenditure; X = Export; M = Import; T = Tax ; S = Saving; D = Depreciation; NLA = Net Income from Abroad

Which of the following expressions is/are CORRECT?

A. $GDP_F = C + I + G + X - M$

B. $GDP_M = C + I + G + X$

C. $NNP_F = C + I + G + X - M - T + S - D + NIA$

D. $NNP_F = C + I + G + X - M - T + S - D$

Question 38

Which of the following major developments have been undertaken after the initiation of structural reforms in 1991 of the Indian Economy?

A. A general deregulation of interest rates and a greater role for market forces in the determination of both interest and exchange rates

B. The phase out of ad hoc Treasury Bill, which puts a check on the automatic monetization of the fiscal deficit

C. An exchange rate anchor under a Proportional Reserve System

D. A commitment to the Fiscal Responsibility and Budget Management (FRBM) which sought to put ceiling on the overall fiscal deficit

Question 39

Which of the following functions qualify to be a cumulative density function of a random variable X ?

A. $F(x) = \begin{cases} 1 - e & x \in (0, \infty) \\ 0, & \text{otherwise} \end{cases}$

B. $F(x) = (1 + e^{-x})^{-1}, \quad x \in (-\infty, \infty)$

C. $F(x) = \begin{cases} 1 - x^{-1}\ln(x), & x \in (e, \infty) \\ 0, & \text{otherwise} \end{cases}$

D. $F(x) = \begin{cases} 1 - (\ln(x))^{-1} & x \in (e, \infty) \\ 0, & \text{otherwise} \end{cases}$

Question 40

Let the joint probability density function of the random variables X and Y be

$$f(x, y) = \begin{cases} 1, & 0 < x < 1, \\ 0, & \text{otherwise} \end{cases} \qquad x < y < x + 1$$

Let the marginal density of X and Y be $f_X(x)$ and $f_Y(y)$, respectively. Which of the following is/are CORRECT?

A. $f_X(x) = \begin{cases} 2x, & 0 < x < 1 \\ 0, & \text{otherwise} \end{cases}$ and $f_Y(y) = \begin{cases} 2-y, & 0 < y < 2 \\ 0, & \text{otherwise} \end{cases}$

B. $f_X(x) = \begin{cases} 1, & 0 < x < 1 \\ 0, & \text{otherwise} \end{cases}$ and $f_Y(y) = \begin{cases} y, & 0 < y < 1 \\ 2-y, & 1 \leq y < 2 \\ 0, & \text{otherwise} \end{cases}$

C. $E(X) = \frac{1}{2}, \sqrt{\text{Var}(X)} = \frac{1}{12}$

D. $E(Y) = 1, \quad \text{Var}(Y) = \frac{1}{6}$

Question 41

Let $X \sim \text{Uniform}(8, 20)$ and $Z \sim \text{Uniform}(0, 6)$ be independent random variables. Let $Y = X + Z$ and $W = X - Z$. Then $\text{Cov}(Y, W)$ is _____ (in integer).

Question 42

Let $Y \sim \text{Normal}(3, 1), W \sim \text{Normal}(1, 2)$ and $X \sim \text{Bernoulli}(p = 0.9)$ where $X = 1$ is success and $X = 0$ is failure. Let $S = XY + (1 - X)W$. Then $E(S) =$ _____ (round off to 1 decimal place),

Question 43

If X denotes the sum of the numbers appearing on a throw of two fair six-faced dice then the probability

$P(7 < X < 10) =$ _____ (round off to 2 decimal places).

Question 44

Using the following table,

	Population of the Econowy	GDP of the Economy (in crore)
2010	20,000	25,000
2020	25.000	40,000

the average growth rate (compounded annually) of per capita GDP in an economy during the period 2010 – 2020 is _____ (in percent, round off to 2 decimal places).

Question 45

Consider a Keynesian Cross Model with following features,

Consumption Function: $C = C_0 + b(Y - T)$

Tax Function: $T = T_0 + tY$

Income Identity: $Y = C + I_0 + G_0$

Where, C = Consumption; Y = Real Incôme; T = Tax; I = Investment; G = Government Expenditure; b_c = Parameter; t = Tax Rate (The subscript 0 (zero) indicates, that the concerned variable is autonomous)

If $b = 0.7$ and $t = 0.2$, value of the Keynesian multiplier is _____ (round off to 2 decimal places).

Question 46

Let $[t]$ denote the greatest integer $\leq t$. The number of points of discontinuity of the function $f(x) = \left[x^2 - 3x + 2\right]$ for $x \in [0, 4]$ is _____ (in integer).

Question 47

Let E be the area of the region bounded by the curves $y = x^2$ and $y = 8\sqrt{x}$, $x \geq 0$. Then $30E$ is equal to _____ (round off to 1 decimal place).

Question 48

A firm has production function $y = K^{0.5}L^{0.5}$ and faces wage rate $w = 4$ and rental rate of capital $r = 4$. The firm's marginal cost is equal to _____ (in integer).

Question 49

Let $\hat{y} = 5.5 + 3.2x$ be an estimated regression equation using a large sample. The 95% confidence interval of the coefficient of x is $[0.26, 6.14]$ and $R^2 = 0.26$. The standard error of the estimated coefficient is _____ (round off to 1 decimal place).

Question 50

Let π be the proportion of population vaccinated against a disease. An estimate $\hat{\pi} = 0.64$ is found using a sample of 100 individuals from the population. The z test statistic for the null hypothesis $H_0 : \pi = 0.58$ is _____ (round off to 2 decimal places).

Question 51

An industry has 3 firms (1,2 and 3) in Cournot competition. They have no fixed costs, and their constant marginal costs are respectively

$$c_1 = \frac{9}{30}, c_2 = \frac{10}{30}, c_3 = \frac{11}{30}$$

They face an industry (inverse demand function $P = 1 - Q$ where P is the market price and Q is the industry output (sum of outputs of the 3 firms). Suppose that Q^c is the industry output under Cournot-Nash equilibrium. Then $(Q^c)^{-1}$ is equal to _____ (in integer).

Question 52

A consumer has utility function

$$(x_1, x_2) = \max\{0.5x_1, 0.5x_2\} + \min\{x_1, x_2\}$$

She has some positive income y, and faces positive prices p_1, p_2 for goods 1 and 2 respectively. Suppose $p_2 = 1$. There exists a lowest price $\overline{p_1}$ such that if $p_1 > \overline{p_1}$ then the unique utility maximizing choice is to buy ONLY good 2.

Then $\overline{p}_1$ is _____ (in integer).

Question 53

An economy has three firms: X, Y and Z. Every unit of output that X produces creates a benefit of INR 700 for Y and a cost of INR 300 for Z. Firm X 's cost curve is

$$C(Q_X) = 2Q_X^2 + 10$$

where C represents cost and Q_X is the output. The market price for the output of X is INR 1600 per unit. The difference between the socially optimal output and private profit maximizing output of firm X (in INR) is _____ (in integer).

Question 54

Let $\int \sin^9 x \cos(11x)dx = \cos(10x)f(x) + c$, where c is a constant. If $f''\left(\frac{\pi}{4}\right) - kf'\left(\frac{\pi}{4}\right) = 0$, then k is equal to _____ (in integer).

Question 55

Let $M = \begin{bmatrix} k & 1 & 1 \\ 1 & k & 1 \\ 1 & 1 & k \end{bmatrix}$ and I_3 be the identity matrix of order 3. If the rank of the matrix $10I_3 - M$ is 2 then k is equal to _____ (in integer).

Question 56

In a two period model, a consumer is maximizing the present discounted utility

$$W_t = \ln(c_t) + \frac{1}{1+\theta}\ln(c_{t+1})$$

with respect to c_t and c_{t+1} and subject to the following budget constraint

$$c_t + \frac{c_{t+1}}{1+r} \leq y_t + \frac{y_{t+1}}{1 \text{ dor}}$$

where c_i and y_i are the consumption and income in period $i(i = t, t+1)$ respectively, $\theta \in [0, \infty)$ is the time discount rate and $r \in [0, \infty)$ is the rate of interest. Suppose, consumer is in thê interior equilibrium and $\theta = 0.05$ and $r = 0.08$. In equilibrium, the ratio $\frac{c_{t+1}}{c_t}$ is equal to _____ (round off to 2 decimal places).

Question 57

The portfolio of an investment firm comprises of two risky assets, S and T, whose returns are denoted by random variables R_s and R_M respectively. The mean, the variance and the covariance of the returns are

$$E(R_S) = 0.08, \text{Var}(R_S) = 0.07$$
$$E(R_T) = 0.05, \text{Var}(R_T) = 0.05, \text{Cov}(R_S, R_T) = 0.04$$

Let w be the proportion of assets allotted to S so that the return from the portfolio is $R = wR_s + (1, w)R_T$. The value of w which minimizes Var(R) is _____ (round off to 2 decimal places).

Question 58

A number x is randomly chosen from the set of the first 100 natural numbers.

The probability that x satisfies the condition $x + \frac{300}{x} > 65$ is _____ (round off to 2 decimal places).

Question 59

For $k \in \mathbb{R}$, let $f(x) = x^4 + 2x^3 + kx^2 - k, x \in \mathbb{R}$. If $x = \frac{3}{2}$ is a point of local minima of f and m is the global minimum value of f then $f(0) - m$ is equal to _____ (in integer)

Question 60

If (x^*, y^*) is the optimal solution of the problem

maximize $f(x, y) = 100 - e^{-x} - e^{-y}$

subject to $\quad ex + y = \frac{e}{e-1}, \quad x \geq 0, \quad y \geq 0.$

Then, $\sqrt{\frac{y^*}{x^*}}$ is equal to _____ (round off to 2 decimal places)

IITJAM 2024

Question 1

Which one of the following is a non-parametric test?

A. χ^2-test

B. t-test

C. F-test

D. z-test

Question 2

Let x and y be two consumption bundles, assumed to be non-negative and perfectly divisible. Further, the assumptions of completeness, transitivity, reflexivity, non-satiation, continuity, and strict convexity are satisfied. Then, which of the following statements is NOT CORRECT?

A. Either $x \succeq y$, or $y \succeq x$, or both

B. $y \succ x$ if y contains more of at least one good and no less of any other

C. x is not indifferent to itself

D. For x (or y), its better set is strictly convex

Question 3

Consider a production function of the form:

$$Y = a \log L + (1 - a) \log K, \quad a \in (0, 1), \quad a \neq 0.5$$

where Y is output, L is labour, and K is capital. Then, the absolute value of elasticity of substitution is

A. 1

B. a

C. $(1 - a)$

D. ∞

Question 4

Consider a closed economy with consumption function $C = 2 + 0.5Y$, where Y is income. The government expenditure is 3 and investment function is $I = 4 - 0.5r$, where r is interest rate. Then, the slope of the IS curve will be

A. 1

B. -0.5

C. 1.5

D. -1

Question 5

Which of the following was announced in the Union Budget 2023-24 to enhance the skills of lakhs of youth in the next 3 years?

A. Pradhan Mantri Kaushal Vikas Yojana (PMKVY) 1.0

B. Pradhan Mantri Kaushal Vikas Yojana (PMKVY) 2.0

C. Pradhan Mantri Kaushal Vikas Yojana (PMKVY) 3.0

D. Pradhan Mantri Kaushal Vikas Yojana (PMKVY) 4.0

Question 6

Suppose a random variable X follows an exponential distribution with mean 50. Then, the value of the conditional probability $P(X > 70 \mid X > 60)$ is

A. $e^{-\frac{7}{5}}$

B. $e^{-\frac{6}{5}}$

C. $e^{-\frac{1}{5}}$

D. $e^{-\frac{7}{6}}$

Question 7

Which of the following measures was NOT initiated by the Government of India as a part of economic reforms in 1991?

A. Announcement of new industrial policy

B. Full convertibility of rupee on the capital account

C. Removal of Quantitative Restrictions

D. Guidelines for investment by Foreign Institutional Investors (FIIs) in the capital market

Question 8

Suppose nominal GDP equals 1,000 units and money supply equals 250 units. Based on the quantity theory of money, the velocity of money equals

A. 40

B. 4

C. 250,000

D. 500

Question 9

Let $S_1 = \{(x, y) \in \mathbb{R}^2 : x + y \geq 1, x + y \leq 2, y \geq x^2, x, y \geq 0\}$ and $S_2 = \{(x, y) \in \mathbb{R}^2 : x + y \geq 1, x + y \leq 2, y \leq x^2, x, y \geq 0\}$. Then, which of the following is CORRECT?

A. Both S_1 and S_2 are convex sets

B. S_1 is a convex set but S_2 is not a convex set

C. S_2 is a convex set but S_1 is not a convex set

D. Neither S_1 nor S_2 are convex sets

Question 10

$\lim_{x\to\infty}\left(1+\frac{1}{x}\right)^x$ is equal to

A. e

B. $\frac{1}{e}$

C. 1

D. ∞

Question 11

Two distinct integers are chosen randomly from 5 consecutive integers. If the random variable X represents the absolute difference between them, then the mean and variance of X are, respectively,

A. 1 and $\frac{3}{2}$

B. 2 and 5

C. 1 and 3

D. 2 and 1

Question 12

Consider two independent random variables: $X \sim N(5,4)$ and $Y \sim N(3,2)$. If $(2X+3Y) \sim N(\mu,\sigma^2)$, then the values of mean (μ) and variance (σ^2) are

A. $\mu = 19$ and $\sigma^2 = 34$

B. $\mu = 8$ and $\sigma^2 = 14$

C. $\mu = 19$ and $\sigma^2 = 14$

D. $\mu = 8$ and $\sigma^2 = 34$

Question 13

The optimal value of the linear programming problem

$$\text{Maximise } Z = 2x + 3y$$

subject to

$$\begin{aligned} 5x + 4y &\le 20, \\ 3x + 5y &\le 15, \\ 2x + y &\le 4, \\ x, y &\ge 0, \end{aligned}$$

is

A. 4

B. $\frac{64}{7}$

C. 9

D. $\frac{72}{7}$

Question 14

The solution of the differential equation

$$xy\,dx - (x^2 + y^2)\,dy = 0, \quad y(0) = 1$$

is

A. $y = e^x$

B. $y^2 = e^{x^2}$

C. $y^2 = e^x$

D. $y = e^{x^2}$

Question 15

Which of the following is NOT CORRECT?

A. Permanent settlement was introduced by Lord Cornwallis in Bengal in 1793

B. The First War of Indian Independence occurred in 1857

C. Dadabhai Naoroji prepared the estimate of national income in 1860

D. In 1905, Swadeshi Movement was started in India

Question 16

In a two-player game, player 1 can choose either M or N as strategies. Player 2 can choose either X, Y, or Z as strategies. The payoff matrix is as follows:

	X	Y	Z
M	$(3,1)$	$(0,0)$	$(-1,2)$
N	$(0,0)$	$(1,3)$	$(0.5,1)$

Which set of strategy profiles survives iterated elimination of strictly dominated strategies?

A. (N, Y)

B. (M, X)

C. (N, Z)

D. (M, Z)

Question 17

For a profit maximising monopolist, the ratio of the profit margin to price (also known as the Lerner Index or the relative mark-up) has a relationship with the price-elasticity of demand at the profit maximising price. Then, which of the following statements is CORRECT?

A. The larger the elasticity of demand at the profit maximising price, the greater is the relative mark-up

B. The power to sustain a price higher than the marginal cost depends only on the profit maximising price

C. At the profit maximising price, given costs are greater than zero, the price elasticity of demand is strictly larger than unity

D. At the revenue maximising price, the price elasticity of demand is greater than unity

Question 18

To study the effect of X_1 and X_2 on Y, the following regression model is estimated using a large sample:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \epsilon$$

The OLS estimates and standard errors are presented below:

	α	β_1	β_2
Estimates	2.30	0.39	1.80
Standard errors	1.15	0.13	1.00

Given the above information, which of the following is CORRECT?

A. α is statistically significant at 5% level, β_1 is statistically significant at 1% level, and β_2 is statistically significant at 10

B. α is statistically significant at 5% level, β_1 is statistically significant at 10% level, and β_2 is statistically significant at 5% level

C. α is statistically significant at 1% level, β_1 is statistically significant at 5% level, and β_2 is statistically significant at 10% level

D. α is statistically significant at 1% level, β_1 is statistically significant at 10% level, and β_2 is statistically significant at 5% level

Question 19

Suppose high quality and low quality products are sold at the same price to the buyers. The buyers have less information to determine the quality of the product compared to the sellers at the time of purchase. Which of the following problems arises in this situation?

A. Moral hazard problem

B. Market signaling problem

C. Principal-agent problem

D. Adverse selection problem

Question 20

Individuals who were either unemployed or out of labour force but had worked for at least 30 days over the reference year were included in the labour force by the NSSO in its labour force surveys. Under which one of the following classifications does the above procedure appear?

A. Usual Principal Status

B. Usual Principal and Subsidiary Status

C. Current Weekly Status

D. Current Daily Status

Question 21

Let the production function be given by

$$Y_t = A_t K_t^{\alpha} H_t^{\beta} L_t^{1-\alpha-\beta}$$

where, at time t, Y_t is output, A_t is level of Total Factor Productivity, K_t is physical capital, H_t is human capital, and L_t is labour. $\alpha = \frac{1}{5}$ and $\beta = \frac{2}{5}$. If the growth rate of Y_t equals 10 percent, the growth rate of K_t equals 5 percent, the growth rate of H_t equals 5 percent, and the growth rate of L_t equals 10 percent, then the growth rate of A_t is

A. 2 percent

B. 3 percent

C. 5 percent

D. 10 percent

Question 22

Consider an economy where technology is characterised by the production function:

$$Y = 50K^{0.4}L^{0.6}$$

where Y is output, K is capital, and L is labour. Assuming perfect competition in the product market and in the factor markets, the share of total income paid to labour is equal to

A. 0.2

B. 0.3

C. 0.4

D. 0.6

Question 23

In a two-player game, player 1 can choose either U or D as strategies. Player 2 can choose either L or R as strategies. Let c be a real number such that $0 < c < 1$. If the payoff matrix is

	L	R
U	$(0, 0)$	$(0, -c)$
D	$(-c, 0)$	$(1-c, 1-c)$

then the number of pure strategy Nash Equilibria in the game equals

A. 1

B. 2

C. 3

D. 4

Question 24

The Rangarajan Panel on 4th June 1993 submitted recommendations related to Balance of Payment (BoP). Which one of the following was NOT a part of the Panel's recommendations?

A. Efforts should be made to replace debt flows with equity flows

B. The ratio of debt linked to equity should be limited to 1:4

C. The minimum targets for foreign reserves should be fixed in such a way that the reserves are generally in a position to accommodate imports of 3 months

D. No sovereign guarantee should be extended to private sector

Question 25

According to the "State of Inequality in India Report" from the Institute for Competitiveness, released on 18th May 2022, which of the following statements is CORRECT?

A. In India, the percentage of anaemic children under 5 years of age has decreased from 67.1 percent in 2015-16 to 58.6 percent in 2019-21

B. The female labour force participation rate in India has increased from 49.8 percent in 2017-18 to 53.5 percent in 2019-20

C. Using data from the Periodic Labour Force Survey (PLFS) 2019-20, the report shows that individuals with monthly salary of Rs. 25,000 are among the top 10 percent of total wage earners

D. By the end of 2019-20, 95 percent of all schools in India have functional toilets for girls

Question 26

Consider the production function:

$$Q(K, L) = (2\sqrt{K} + 3\sqrt{L})^2$$

where Q is the output, K is capital, and L is labour. If η_K and η_L denote the output elasticities with respect to capital and labour, respectively, then the value of $(\eta_K + \eta_L)$ is

A. 2

B. 1

C. 4

D. 0.5

Question 27

Consider a short-run Phillips curve with a constant expected rate of inflation. If the aggregate demand decreases unexpectedly and the labour force remains the same, then what will happen to aggregate price and unemployment rate?

A. Aggregate price rises and unemployment rate falls

B. Aggregate price falls and unemployment rate rises

C. Aggregate price rises and unemployment rate rises

D. Aggregate price falls and unemployment rate falls

Question 28

Suppose the price elasticity of demand (e_D) is $-\frac{1}{5}$ and the price elasticity of supply (e_S) is $\frac{2}{5}$. Then, the incidence of a specific (or unit) tax on the firms is equal to

A. $\frac{1}{3}$

B. $\frac{2}{3}$

C. $\frac{1}{2}$

D. $\frac{1}{4}$

Question 29

The differential equation satisfied by circles with radius 3 and center lying on the Y-axis is

A. $\left(\frac{dy}{dx}\right)^2 = \frac{x^2}{9+x^2}$

B. $\left(\frac{dy}{dx}\right)^2 = \frac{9+y^2}{y^2}$

C. $\left(\frac{dy}{dx}\right)^2 = \frac{x^2}{9-x^2}$

D. $\left(\frac{dy}{dx}\right)^2 = \frac{9-y^2}{y^2}$

Question 30

Suppose expected inflation rate (π_t^e) of an individual is formed as:

$$\pi_t^e = (1-\theta)\bar{\pi} + \theta\pi_{t-1}$$

where, $\bar{\pi}$ is constant inflation rate, π_{t-1} is previous year's inflation rate, and $0 \leq \theta \leq 1$ is weight assigned to inflation rate at different points in time. Then, which of the following is NOT CORRECT?

A. If $\theta = 0$, then the individual assumes a constant inflation rate

B. If $\theta \approx 1$ and $\bar{\pi} < \pi_{t-1}$, then the individual expects this year's inflation rate to be similar to last year

C. The original Phillips curve is derived under the assumption of $\theta \approx 1$

D. A modified Phillips curve is derived under the assumption of $\theta = 1$

Question 31

In the case of a small open economy with fixed exchange rate regime and imperfect capital mobility, which of the following is/are CORRECT?

A. Fiscal contraction will lead to Balance of Payment deficit in the short-run if the slope of LM curve is greater than the slope of Balance of Payment curve

B. Fiscal contraction will lead to Balance of Payment deficit in the short-run if the slope of LM curve is less than the slope of Balance of Payment curve

C. Monetary expansion leads to Balance of Payment surplus in the short-run irrespective of the slopes of the LM curve and the Balance of Payment curve

D. Monetary expansion leads to Balance of Payment deficit in the short-run irrespective of the slopes of the LM curve and the Balance of Payment curve

Question 32

Consider the following three utility functions:

$$F = 4x_1 + 2x_2, \quad G = \min(4x_1, 2x_2), \quad \text{and} \quad H = \sqrt{x_1} + x_2$$

where, x_1 and x_2 are two goods available at unit prices p_{x_1} and p_{x_2}, respectively. Which of the following is/are CORRECT for the above utility functions?

A. The marginal rate of substitution is given by -1, -2, and $-0.5\sqrt{x_1}$ for the utility functions F, G, and H, respectively

B. If $p_{x_1} = p_{x_2}$, then the utility maximisation problem with utility function F has a corner solution

C. If income is 100 and $p_{x_1} = p_{x_2} = 2$, then in the utility maximisation problem with utility function G, the sum of the optimal values of x_1 and x_2 is 50

D. If income is 100, $p_{x_1} = 5$, and $p_{x_2} = 5000$, then in the utility maximisation problem with the utility function H, the optimal value of x_2 is 20

Question 33

The characteristics of pure public good is/are

A. rival in consumption

B. excludable in consumption

C. non-rival in consumption

D. non-excludable in consumption

Question 34

Consider a hypothetical economy where only apples and oranges are produced for three years:

	Apples	Oranges		
Year	Quantity (Kg)	Price (Rs. per Kg)	Quantity (Kg)	Price (Rs. per Kg)
2015	10	180	5	200
2016	15	200	12	300
2017	18	250	15	350

Which of the following is/are CORRECT?

A. Real GDP in the year 2017 (base year = 2016) is Rs. 4,250

B. Real GDP in the year 2016 (base year = 2015) is Rs. 3,500

C. Nominal GDP in the year 2015 is Rs. 6,600

D. Price level, as measured by GDP deflator, increased in 2017 as compared to 2016 (base year = 2016)

Question 35

Let a random variable X has mean μ_X and non-zero variance σ_X^2, and another random variable Y has mean μ_Y and non-zero variance σ_Y^2. If the correlation coefficient between X and Y is ρ, then which of the following is/are CORRECT?

A. $|\rho| \leq 1$

B. The regression line of Y on X is $y = \mu_Y + \frac{\rho\sigma_X}{\sigma_Y}(x - \mu_X)$

C. The variance of $X - Y$ is $\sigma_X^2 + \sigma_Y^2 - 2\rho\sigma_X\sigma_Y$

D. $\rho = 0$ implies X and Y are independent random variables

Question 36

Let $X_1, X_2, \ldots, X_n$ be a random sample of size $n > 1$ drawn from a probability distribution having mean μ and non-zero variance σ^2. Then, which of the following is/are CORRECT?

A. The sample mean has standard deviation $\frac{\sigma}{\sqrt{n}}$

B. The probability distribution of $\frac{\sum_{i=1}^{n}(X_i-\mu)}{\sigma\sqrt{n}}$ will tend to follow standard normal distribution as $n \to \infty$

C. $(n-1)\frac{S^2}{\sigma^2}$ will follow χ^2 distribution with $(n-1)$ degrees of freedom, where S^2 is the sample variance

D. The sample mean is always a consistent estimator of μ

Question 37

Let $M = \begin{pmatrix} \alpha & -6 \\ -1 & 1 \end{pmatrix}$, $\alpha \in \mathbb{R}$ be a 2×2 matrix. If the eigenvalues of M are β and 4, then which of the following is/are CORRECT?

A. $\alpha + \beta = 1$

B. An eigenvector corresponding to β is $[2, 1]^T$

C. The rank of the matrix M is 2

D. The matrix $M^2 + M$ is invertible

Question 38

Let $f : \mathbb{R}^2 \to \mathbb{R}$ be a function defined as

$$f(x, y) = \begin{cases} \frac{x^2 y}{x^4+y^2}, & \text{if } (x, y) \neq (0, 0) \\ 0, & \text{if } (x, y) = (0, 0) \end{cases}$$

Then, which of the following is/are CORRECT?

A. $\lim_{(x,y)\to(0,0)} f(x, y) = 0$

B. $f_x(0, 0) = 0$

C. $f(x, y)$ is not continuous at $(0, 0)$

D. Both f_x and f_y do not exist at $(0, 0)$

Question 39

Which of the following is/are NOT CORRECT?

A. Under the Reserve Bank of India Act, 1938, every scheduled bank has to keep certain minimum cash reserves with the RBI

B. CRR is the statutory reserve requirements to be kept by every scheduled bank with the RBI

C. A higher SLR increases the capacity of commercial banks to grant loans and advances

D. A high SLR can be considered as a tax on the banking system

Question 40

According to the NITI Aayog's "National Multidimensional Poverty Index: A Progress Review 2023", which of the following is/are CORRECT?

A. The rural areas in India have experienced the fastest decline in percentage of multidimensional poverty from 35.59 percent in 2015-16 to 21.28 percent in 2019-21

B. The incidence of poverty in urban areas in India increased from 5.27 percent in 2015-16 to 8.65 percent in 2019-21

C. A decline in India's Multidimensional Poverty Index in 2019-21 is due to improvement in all the 12 indicators

D. At the national level, there is a decline in the intensity of poverty between 2015-16 and 2019-21

Question 41

A firm has a production function that is homogenous of degree one given by

$$Q = 2\sqrt{LK},$$

where Q is quantity, L is labour, and K is capital. The unit price of L is Rs. 4 and the unit price of K is Rs. 16. Assuming that there is zero fixed cost, the total cost (long run) of producing 10 units of Q is Rs. _____ (in integer).

Question 42

Two students A and B are assigned to solve a problem separately. The (conditional) probability that A can solve the problem given that B cannot solve it, is $\frac{1}{5}$. The (conditional) probability that B can solve the problem given that A can solve the problem is $\frac{3}{5}$. The probability that A can solve the problem is $\frac{1}{10}$. Then, the probability that B can solve the problem is _____ (rounded off to one decimal place).

Question 43

Suppose the cash reserve ratio is 5 percent in a country. Assume that commercial banks keep zero excess reserve and the cash-to-deposit ratio is 5 percent. To increase the money supply by Rs. 10,500 crores, the central bank of the country should inject Rs. _____ crores (in integer).

Question 44

Suppose an Indian company borrowed 300 dollars from a foreign bank at the beginning of the year and repaid it in dollars along with the agreed interest rate of 12 percent per annum. At the time of borrowing, the exchange rate was Rs. 70 per dollar. Assuming zero inflation rate in both the countries, the real cost of borrowing will be zero if the exchange rate is Rs. _____ per dollar at the time of repayment (rounded off to one decimal place).

Question 45

There are 32 students in a class. Three courses namely English, Hindi and Mathematics are offered to them. Each student must register for at least one course. If 16 students take English, 8 students take Hindi, 18 students take Mathematics, 4 students take both English and Hindi, 5 students take both Hindi and Mathematics, and 5 students take both English and Mathematics, then the number of students who take Mathematics only is _____ (in integer).

Question 46

Let an inverse demand function for a commodity be $p = e^{-\frac{x}{2}}$, where x is the quantity and p is the price. Then, at $p = 0.5$, the consumer surplus is equal to _____ (rounded off to two decimal places).

Question 47

The linear system of equations

$$\begin{aligned} x + y &= 3, \\ x + (k^2 - 8)y &= k, \quad k \in \mathbb{R} \end{aligned}$$

has no solution for $k =$ _____ (in integer).

Question 48

A manufacturer producing pens has the following information regarding the cost of production of pens:

Output (Q)	1	2	3
Total Costs (TC)	4	13	32

If the total cost function is of the form $TC(Q) = aQ^2 + bQ + c$ where a, b, and c are constants, then the value of $TC(Q)$ at $Q = 4$ is _____ (in integer).

Question 49

Consider the information given in the table below:

Year	Unemployment Rate (in percent)	Number of unemployed (in millions)	Labour Force Pa
2010	15	30	
2020	20	50	

The percentage change in working-age population from 2010 to 2020 is _____ (rounded off to two decimal places).

Question 50

Consider the following information: Consumption $(C) = 250 + 0.25Y_d$, where Y_d is disposable income Autonomous Investment $(I_0) = 100$

Government Expenditure $(G_0) = 50$

Income tax rate $(t) = 20$ percent The equilibrium level of consumption in the economy is _____ (in integer).

Question 51

An individual owns a mobile phone, currently valued at Rs. 40,000. The current wealth of the individual is Rs. 2,00,000 (including the value of the mobile phone). According to reports, there is a 20 percent chance of mobile phone theft and an actuarially fair insurance policy is available to insure the loss of the mobile phone against a theft. The individual's von-Neumann-Morgenstern utility of wealth function is given by $U(W) = \sqrt{W}$, where W is the wealth. Then, the maximum willingness to pay for such an actuarially fair insurance policy is Rs. _____ (rounded off to nearest integer).

Question 52

Consider the following AK model where the production function is given by

$$Y = AK$$

where Y is output, K is capital, and A is a constant that reflects the level of technology. Suppose there is zero technological progress in the economy and $A = 0.50$. In the economy, the savings rate equals 0.60 and the depreciation rate for the capital stock equals 0.05. The population growth rate equals zero and the size of the labour force is normalised to 1. Based on the AK model, the steady state growth rate of output per capita in the economy equals _____ percent (in integer).

Question 53

A regression equation $Y = -2.5 + 2X$ is estimated using the following data:

Y	2	5	9	14
X	2	4	6	8

The coefficient of determination is _____ (rounded off to two decimal places).

Question 54

A consumer's utility function is given by:

$$u(x_1, x_2) = (2x_1 - 1)^{0.25}(x_2 - 4)^{0.75}$$

If the consumer has a budget of 73 and the unit prices of x_1 and x_2 are given by 2 and 1, respectively, then the value of $(x_1 + x_2)$ is _____ (rounded off to two decimal places).

Question 55

An industry has 6 firms in Cournot competition. Each of the 6 firms has zero fixed costs, and a constant marginal cost equal to 20. The product is homogeneous and the

industry inverse demand function is given by $P = 230 - Q$, where P is the market price and Q is the industry output (sum of outputs of the 6 firms). The market price under Cournot-Nash equilibrium is equal to _____ (in integer).

Question 56

Let the value of a random sample drawn from a normal distribution with mean 5 and unknown standard deviation σ be 4.8, 4.5, 5.1, 5.2, 5.3, 5.5. Then, the maximum likelihood estimate of σ^2 is _____ (rounded off to two decimal places).

Question 57

An economy produces a consumption good and also has a research sector which produces new ideas. Time is discrete and indexed by $t = 0, 1, 2, \ldots$. The production function for the consumption good is given by

$$Y_t = A_t L_{yt}$$

where, at time t, Y_t is the amount of consumption good produced, A_t is the stock of existing knowledge, and L_{yt} is the amount of labour devoted to production of consumption good. It is known that $A_0 = 1$. The production function for new ideas is given by

$$A_{t+1} - A_t = \frac{1}{250} A_t L_{at}$$

where L_{at} is the amount of labour devoted to production of new ideas at time t. Suppose that for all t, $L_{at} = 10$ and $L_{yt} = 90$. Then, the growth rate of the consumption good (Y_t) at $t = 50$ is _____ percent (in integer).

Question 58

Consider a closed economy IS-LM model. The goods and the money market equations are respectively given as follows:

$$Y = 90 + 0.8Y_d - 100i + G$$
$$M_s = 750 + 0.2Y - 260i$$

where, Y = national income; Y_d = disposable income; T = total tax given by $T = 5 + 0.2Y$; i = interest rate; G = government expenditure = 300; M_s = constant money supply = 950. The value of T at equilibrium Y is _____ (rounded off to the nearest integer).

Question 59

The supply curve is given as $p = 10 + x + 0.1x^2$, where p is the market price and x is the quantity of goods supplied. The change in the producer surplus due to an increase in market price from 30 to 70 is _____ (rounded off to nearest integer).

Question 60

There are two goods X and Y and there are two consumers A and B in a pure exchange economy. A and B have Cobb-Douglas utility functions of the form $U_A = 2X^{0.4}Y^{0.6}$ and $U_B = X^{0.3}Y^{0.7}$, respectively. Initially, A is endowed with 50 units of good X and 20 units of good Y. Similarly, B is endowed with 50 units of good X and 20 units of good Y. If the unit price of good Y is normalized to 1, then the equilibrium unit price for good X is _____ (rounded off to two decimal places).

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Question 1

Let A be an invertible matrix given by $A = \begin{pmatrix} 1 & x \\ 0 & 1 \end{pmatrix}$. If $A^{-1} = \begin{pmatrix} 1 & y \\ 0 & 1 \end{pmatrix}$, then the value of $x + y$ is

A. 1

B. 0

C. -1

D. 2

Question 2

If the equations $-x + y - 2z = 0$, $x - y + z = 0$ and $ax - by + z = 0$ have a non-trivial solution, then

A. $a = b + 1$

B. $a + b = 0$

C. $a = b$

D. $a + 1 = b$

Question 3

The value of the determinant $\begin{vmatrix} \alpha & \alpha+2 & \alpha+4 \\ \alpha+2 & \alpha+4 & \alpha+6 \\ \alpha+4 & \alpha+6 & \alpha+9 \end{vmatrix}$ is

A. α

B. $\alpha + 4$

C. 4

D. -4

Question 4

If 25, x_1, x_2, 16 are 4 consecutive terms of an arithmetic progression, then

A. $x_1 = 20, x_2 = 17$

B. $x_1 = 22, x_2 = 19$

C. $x_1 = 23, x_2 = 18$

D. $x_1 = 21, x_1 = 17$

Question 5

The first three terms of a geometric progression are such that their sum is $\frac{21}{4}$ and their product is 1. Which of the following is not a term of the geometric progression?

A. 4

B. 1

C. $\frac{1}{8}$

D. $\frac{1}{4}$

Question 6

How many two-digit numbers can be formed using the numbers 0, 1 and 2 considering that the digits may be repeated?

A. 8

B. 4

C. 9

D. 6

Question 7

From a class of 4 boys and 3 girls, four students are to be selected to form a mathematics olympiad team so that at least 2 girls are there in the team. In how many ways can this be done?

A. 22

B. 23

C. 24

D. 18

Question 8

For any positive integer $n \geq 2$, $2^{2n} - 3^n - 1$ is always divisible by

A. 20

B. 6

C. 9

D. 15

Question 9

In the binomial expansion of $(1 - x)^n$ where n is a positive integer, if the coefficients of x and x^3 are equal then the value of n is

A. 3

B. 4

C. 5

D. 6

Question 10

Which of the following functions is differentiable at $x = 0$?

A. $\max(0, x)$

B. $\max(0, x) + \min(0, x)$

C. $\min(0, x)$

D. $\max(0, x) - \min(0, x)$

Question 11

$\lim_{n\to\infty} \left(\frac{1+n^2}{1+n^3}\right)^{\frac{1}{2}}$ is

A. 1

B. 0

C. ∞

D. does not exist

Question 12

The integral $\int \frac{dx}{x^2-x}$ is

A. $\log_e \left|1 - \frac{1}{x}\right| + C$

B. $\log_e \left|\frac{x}{x-1}\right| + C$

C. $\frac{1}{3}x^3 - \frac{1}{2}x^2 + C$

D. none of the above

Question 13

The integral $\int xe^{-\frac{1}{2}(1+a^2)x}\, dx$ is

A. $\frac{1}{2(1+a^2)}$

B. $\frac{2}{(1+a^2)}$

C. $\frac{1}{4(1+a^2)^2}$

D. none of the above

Question 14

Let $f(x) = \frac{1-|x|}{1+|x|}$. Which of the following is true regarding the function f?

A. Both minimum and maximum exist

B. Maximum exists but minimum does not

C. Minimum exists but maximum does not

D. Neither maximum nor minimum exist

Question 15

Consider the function $f(x) = \sum_{i=1}^{10}(x - i)^2$. The minimum of f is attained at

A. $x = 5$

B. $x = 4.5$

C. $x = 5.5$

D. none of the above

Question 16

Consider the values of (x, y) that satisfy $x^2 + y^2 \leq 1$. Under this constraint, the maximum of $(7x - 5y)$ is

A. $\sqrt{7}+5$

B. $\sqrt{7}-5$

C. $\sqrt{72+52}$

D. $\sqrt{72-52}$

Question 17

Let I denote the identity matrix. If A is a non-singular matrix that satisfies $AA^T = A^TA$ and $B = A^{-1}A^T$, then BB^T is

A. B^{-1}

B. B^T

C. $B+I$

D. I

Question 18

Consider a 4×4 matrix A with its entries A_{ij} given by $A_{ij} = \begin{cases} 2 & \text{if } i \geq j, \\ 0 & \text{if } i < j. \end{cases}$. Then the determinant of the matrix A is

A. 2

B. -2

C. 16

D. -16

Question 19

A vaccine has a 90% probability of being effective in preventing a certain disease. The probability of getting the disease if a person is not vaccinated is 50%. In a certain geographic region, 25% of the people get vaccinated. A person is selected from that region at random. Then the probability that he or she will contract the disease is

A. 0.25

B. 0.75

C. 0.40

D. 0.60

Question 20

A speed post company sends 60% of its orders by a parcel service that delivers late 2% of the time. It sends the other 40% of its orders by a local transportation service that delivers late by 7% of the time. Then the probability that an order delivered late was sent by the parcel service is

A. 0.04

B. 0.30

C. 0.35

D. 0.09

Question 21

The mode of a random variable X that follows a Binomial $(6, \frac{1}{3})$ distribution is

A. 3

B. 5

C. 2

D. 4

Question 22

The maximum value of the variance of a random variable X that follows a Binomial (n, p) distribution is

A. $\frac{n^2}{4}$

B. $\frac{n^2}{2}$

C. $\frac{n}{2}$

D. $\frac{n}{4}$

Question 23

There are 500 misprints in a book of 500 pages. Assume that the number of misprints on a page follows a Poisson distribution. Then the probability that a given page will contain at least 3 misprints is

A. $1 - \frac{5}{2e}$

B. $1 - \frac{2}{e}$

C. $\frac{5}{2e}$

D. $\frac{2}{e}$

Question 24

The weekly wage of workers of a factory follows a normal distribution with a mean of Rs. 400 and a standard deviation of Rs. 50. If the wages of 80 workers are less than Rs. 350, then the approximate total number of workers in the factory is (Given $\int_0^1 \frac{1}{\sqrt{2\pi}} e^{-\frac{t^2}{2}}\, dt = 0.34$)

A. 400 workers

B. 450 workers

C. 500 workers

D. 550 workers

Question 25

If a random variable X follows a normal distribution having mean, $\mu = 18$, and variance $\sigma^2 = 625$, then $P(X < 67 | X > 18)$ is (Given $\int_0^{1.96} \frac{1}{\sqrt{2\pi}} e^{-\frac{t^2}{2}}\, dt = 0.475$)

A. 0.950

B. 0.475

C. 0.500

D. 0.525

Question 26

Consider a seller who sells a product that has unit elastic demand (i.e., the elasticity of demand for the product is 1). If the price of the good increases by 10

A. It increases by 10

B. It increases by 20

C. It decreases by 10

D. It remains unchanged

Question 27

Consider a consumer who consumes only goods A and B (both of which are normal goods). Suppose that the price of good A decreases while the price of good B stays constant. Which of the following is correct:

A. Both the income effect and the substitution effect lead to an increase in the consumption of good A.

B. Both the income effect and the substitution effect lead to a decrease in the consumption of good A.

C. The income effect leads to an increase in the consumption of good A and a decrease in the consumption of good B.

D. The income effect leads to a decrease in the consumption of good A while the substitution effect leads to an increase in the consumption of good B.

Question 28

Consider a perfectly competitive market for a vaccine. Initially, supply of the vaccine is given by $P = 1000 + 10Q$ and demand is given by $P = 1600 - 5Q$. Then, due to the release of a study finding adverse side effects of the vaccine, the demand decreases. Which of the following can possibly be the new equilibrium price and quantity?

A. $P = 1300, Q = 30$

B. $P = 1300, Q = 50$

C. $P = 1500, Q = 30$

D. $P = 1500, Q = 50$

Question 29

A consumer consumes only goods A and B. Suppose that deflation causes the price of both goods, as well as the consumer's income, to decrease by 5

A. It would shift inward but remain parallel to the original one

B. It would shift outward but remain parallel to the original one

C. It would pivot (rotate) at the vertical axis, so that it becomes flatter

D. It would remain unchanged

Question 30

The law of diminishing marginal product implies that the marginal product curve eventually (i.e., for high enough quantities of the input):

A. decreases

B. increases

C. increases at a decreasing rate

D. None of the above; the law of diminishing marginal product has nothing to do with the marginal product curve

Question 31

Gross Domestic Product is the sum of which of the following?

A. the value of all intermediate and final goods and services produced

B. the value of final goods and services produced in a country

C. the sum of net factor income received in a year

D. all the above

Question 32

If an Indian citizen is employed by an Indian company in Germany, the income the Indian citizen earns and remits is:

A. part of German GNP and Indian GDP

B. part of German GNP and Indian GNP

C. part of German GDP and Indian GNP

D. part of German GDP and Indian GDP

Question 33

Suppose that gross national product at market price is $4300.5 billion, depreciation is $550.1 billion, and indirect taxes are $399.3 billion. Then, which of the following appropriately shows the net national product at factor cost?

A. $3351.1 billion

B. $4549.8 billion

C. $3851.2 billion

D. $3750.4 billion

Question 34

Assume that an economy in a particular year has exports = 300, imports = 400, tax revenues = 1100, government purchases = 1400, gross domestic savings = 900. Then the level of gross domestic investment is:

A. 600

B. 700

C. 900

D. 1100

Question 35

Assume that a country produces only two types of commodities: Wheat and Sugar. The country imports Rice. The table below shows the price and the total quantity of Wheat and Sugar produced and Rice imported in year 2020 and 2021.

	Year 2020		Year 2021	
Product	Quantity (KG)	Price (INR)	Quantity (KG)	Price (INR)
Wheat	500	10	700	20
Sugar	150	20	250	40
Rice	100	30	300	40

From the given table, what is the real GDP in 2021 at 2020 prices?

A. 21000

B. 24000

C. 8000

D. None of these

Question 36

When you reverse the digits of the number 14, the number increases by 27. How many other two-digit numbers increase by 27 when their digits are reversed?

A. 4

B. 5

C. 6

D. 7

Question 37

If the value of $-2k + (8 - 30k)^{0.5}$ is positive, which of the following ranges represents the value of k?

A. $-4 < k < \frac{8}{30}$

B. $k < 0.25$

C. $0 < k < \frac{8}{30}$

D. $-2 < k < \frac{8}{30}$

Question 38

Consider the above figure. ABCD is a square having sides equal to 4 units, and X and Y are the midpoints of AB and CD, respectively. What is the perimeter, in units, of AXCY?

A. 4

B. $2 + 2\sqrt{3}$

C. $4 + 4\sqrt{5}$

D. $8\sqrt{5}$

Question 39

Let X be a positive, two-digit integer. Consider the following two statements:

1. The remainder when X is divided by 9 is 8.
2. The remainder when X is divided by 8 is 7.

In order to pin down the value of X,

A. Statement (I) ALONE is sufficient, but statement (II) ALONE is not sufficient.

B. Statement (II) ALONE is sufficient, but statement (I) ALONE is not sufficient.

C. BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.

D. EACH statement ALONE is sufficient.

Question 40

Yesterday you were unexpectedly given a free ticket to a Sonu Nigam concert scheduled for September 1. The market price of this ticket is INR 750, but the most you could sell it for is only INR 500. Today you discover that Indian Ocean will be giving a concert that same evening. Tickets for the Indian Ocean concert are still available at INR 750. Had you known before receiving your Sonu Nigam ticket yesterday that Indian Ocean would be coming, you definitely would have bought a ticket to see them, not Sonu Nigam. Based on what you are told of your liking , it follows that you should attend the Indian Ocean and not Sonu Nigam.

A. True

B. False

C. More information is needed

D. None of the above

Question 41

Arrange the following sentences in a proper sequence:

1. At least two major shocks have hit the global economy since 2020. It all started with the pandemic-induced contraction of the global output, followed by the Russian-Ukraine conflict leading to a worldwide surge in inflation.
2. In general, global economic shocks in the past were severe but spaced out in time.
3. Then, the central banks across economies led by the Federal Reserve responded with synchronized policy rate hikes to curb inflation.
4. This changed in the third decade of this millennium.

A. ABDC

B. BDAC

C. ADCB

D. BACD

Question 42

Arrange the following sentences in a proper sequence:

1. I was about to examine the hull which formed on deck a kind of horizon platform.
2. Daybreak appeared.
3. Suddenly, I felt it gradually sinking.
4. The morning mists surrounded us, but they soon cleared off.

A. CABD

B. ABDC

C. DBAC

D. BDAC

Question 43

Select the word that is an antonym of PLAUSIBLE

A. Inpalusible

B. Unplausible

C. Implausible

D. Displausible

Question 44

Select the correct sentence:

A. Although domestic consumption rebounded in many economies, the rebound in India was impressive for its scale.

B. Although domestic consumption rebounded in many economies, the bounce in India was impressive for its scale.

C. Although domestic consumption rebounded in many economies, the rebounce in India was impressioned for its scale.

D. Although domestic consumption bounced in many economies, the rebound in India was impressive for its scale.

Question 45

RBI has projected headline inflation at 6.8 per cent in FY23, which is outside its target range. At the same time, it is not high enough to deter private consumption and also not so low as to weaken the inducement to invest. Moderately high inflation has further ensured the anchoring of inflationary expectations preventing prices from weakening demand and growth in India. Additionally, with inflation on the declining path, the interest cost of domestic credit will likely decline, inducing a further increase in demand for credit by corporates and retail borrowers. Which one of the following is the CORRECT logical inference based on the information given in the above passage?

A. Inflation rate in India is alarmingly high and requires brisk intervention of the RBI.

B. Economic growth in India has slowed down due to rising inflationary pressure.

C. Inflationary pressure will ease out in the near future and spur investment.

D. RBI is worried that inflation is outside their target range.

Question 46

Given below are three statements and four conclusions drawn based on the statements.

- Statement 1: Some doctors are writers.
- Statement 2: No writer is an actor.
- Statement 3: All actors are doctors.

- Conclusion I: Some writers are doctors.
- Conclusion II: All doctors are actors.
- Conclusion III: No actor is a writer.
- Conclusion IV: Some actors are writers.

Which one of the following options can be logically inferred?

A. Only conclusion I is correct

B. Only conclusion II and conclusion III are correct

C. Only conclusion I and conclusion III are correct

D. Either conclusion III or conclusion IV is correct

Question 47

Choose the correct words in sequence to fill up the blanks: Even as India's outlook remains bright, global economic_____ for the next year have been _____ down by the combination of a unique set of challenges expected to impart a few downside risks.

A. Prospectus; weighted

B. Prospectus; weighed

C. Prospects; weighted

D. Prospects; weighed

Question 48

The flight will leave at 9:30 PM, we have been ready by 7:30 PM, so that we can reach the airport on time. To make the above sentence grammatically correct, the phrase marked in bold is to be replaced by:

A. were

B. are

C. must be

D. should have been

Question 49

Generally, poverty is primarily measured in terms of lack of monetary means for a decent living. However, by definition, 'poverty' has wider implications and leads to multiple disadvantages at the same time – such as poor health or malnutrition, lack of

sanitation, clean drinking water or electricity, poor quality of education etc. Focusing on one factor alone, such as income, is not enough to capture the reality of poverty. Which one of the following is the MOST APPROPRIATE logical inference based on the information given in the above passage?

A. Deprivation is a unidimensional concept.

B. A multi-dimensional measure of poverty gives a comprehensive picture.

C. Poverty is due to lack of adequate income.

D. Health, sanitation etc. should be improved to eradicate poverty.

Question 50

Based on the given statements, choose the most appropriate option about the conclusions. Statements: In a one-day cricket match, the total runs made by a team were 200. Out of these, 160 runs were made by spinners. Conclusions:

- I. 80% of the team consists of spinners.
- II. The opening batsmen were spinners.

A. Only conclusion I follows

B. Only conclusion II follows

C. Both I and II follow

D. Neither I nor II follows

IGIDR MOCK 1

Question 1

Let $f(x) = x \log\left(1 + x^{-1}\right), 0 < x < \infty$. Then, $\lim_{n\to\infty} f(x)$ is:

A. 1

B. 0

C. e (i.e., exponent)

D. Undefined

E. None of the above.

Question 2

The function $f(x) = -e^{-x}$ is

A. Convex

B. Concave

C. Linear

D. Quasi-linear

E. None of the above.

Question 3

Given $f(x) = \sqrt{x}$, then $f^{-1}(f(x))$ is:

A. x

B. x^2

C. $\sqrt{x}$

D. $\sqrt{x^2}$

E. None of the above.

Question 4

Six horses are running a race. How many different groups of horses could make up the first three finishers?

A. 6

B. 18

C. 20

D. 120

E. 720

Question 5

What are the values of x that satisfy the equation $x^2 + 4x + 3 = 0$

A. -3

B. -1

C. -3 and -1

D. 3 and 4

E. 4

Question 6

A company's profits have doubled for each of the 4 years it has been in existence. If the total profits for the last four years were Rs. 30 million, what were the profits in the first year of operation?

A. Rs.1 million

B. Rs. 2 million

C. Rs. 4 million

D. Rs.4.5 million

E. Rs. 6 million.

Question 7

Find the area of the triangle ABC whose vertices are $A(1,-1,2), B(2,1,-1)$ and $C(3,-1,2)$

A. $2\sqrt{13}$

B. $\sqrt{13}$

C. $\sqrt{15}$

D. $\sqrt{26}$

E. 13

Question 8

The number of solutions of $|x+1| = |x-1|$ is

A. 0

B. 1

C. 2

D. 3

E. None of the above

Question 9

Find the sum of the infinite series whose n^{th} term is $\frac{n}{(n-1)!}$

A. 2e – 1

B. 2e + 1

C. e – 1

D. e+1

E. 2e

Question 10

The ratio of sum of first 3 terms of a Geometric Progression to the sum of first 6 terms is 64 : 91. The common ratio of GP is

A. $\frac{3}{4}$
B. $\frac{1}{2}$
C. $\frac{1}{4}$
D. $\frac{2}{3}$
E. None of the above

Question 11

Y varies with respect to the sum of 2 components; of which one varies directly with X and the other inversely with X. If $Y = 6, X = 4$ and if $Y = \frac{10}{3}, X = 3$; the relation between X and Y is,

A. $Y = 2X - \frac{8}{X}$
B. $Y = X + \frac{4}{X}$
C. $Y = -2X + \frac{4}{X}$
D. $Y = 2X + \frac{4}{X}$
E. None of the above

Question 12

The sum of the series $1 + \frac{1}{3} \cdot \frac{1}{4} + \frac{1}{5} \cdot \frac{1}{4^2} + \frac{1}{7} \cdot \frac{1}{4^3} + \ldots\ldots\ldots \infty = ?$

A. $\ln 3$
B. $\ln 4$
C. In 2
D. $\ln 5$
E. None of the above

Question 13

If the line $y = mx + 5$ be a tangent to the ellipse $7x^2 + 9y^2 = 63$, then $m = ?$

A. ± 1
B. ± 2
C. -1
D. $\pm\sqrt{2}$
E. None of the above

Question 14

The common region represented by the inequalities $3x + 5y \leq 15, 5x + 2y \leq 10, x \geq 0$ and $y \geq 0$ is

A. a triangle
B. a quadrilateral

C. a rectangle

D. a pentagon

E. None of the above

Question 15

$\text{Lt}_{x\to a} \frac{x \sin a - a \sin x}{x-a}$ is equal to

A. $\sin a$

B. $-a \cos a$

C. $\sin a - a \cos a$

D. $a^{\sin a}$

E. None of the above

Question 16

$x = 6 - 8i$, where i is imaginary. Then $|X|$ is

A. 1

B. 10

C. 9

D. 16

E. 5

Question 17

Radius of the circle $x^2 + y^2 - 6x + 4y - 3 = 0$ is

A. 4

B. 3

C. 2

D. 6

E. 10

Question 18

$x = (1 + y)^{-4}$ and $y = -2 \log t$. The derivative of x with respect to t is

A. $\frac{8}{t}$

B. $\frac{8}{t \cdot (1+y)^3}$

C. $\frac{8}{t \cdot (1+y)^5}$

D. $\frac{4}{t.(1+y)^3}$

E. $\frac{8 \log t}{(1+y)^3}$

Question 19

The limit of $\frac{C^{1-\theta}-1}{1-\theta}$ as $\theta \to 1$ is equal to

A. 0

B. π

C. ∞

D. 1

E. $\log(c)$

Question 20

Find $\log_{10}\left(\frac{4}{17}\right) + \log_{10}(68)$

A. $\log_{10}(8)$

B. $\log_{10}(16)$

C. $\log_{10}\left(68\frac{4}{17}\right)$

D. $\log_{10}\left(\frac{72}{17}\right)$

E. None of the above

Question 21

The derivative of the inverse of the function $y = f(x) = \left(x^5 + 3\right)$ is given by

A. $\frac{1}{5}(y-3)^{-\frac{1}{5}}$

B. $\frac{4}{5}(y-3)^{-\frac{4}{5}}$

C. $\frac{4}{5}(y-3)^{-\frac{1}{5}}$

D. $\frac{1}{5}(y)^{-\frac{4}{5}}$

E. None of the above

Question 22

The equation of the tangent to the circle $x^2 + y^2 - 6x - 2y + 2 = 0$ at the point $(1, -1)$ is:

A. $x + y = 2$

B. $3x - y = 0$

C. $x - y = 0$

D. $x + y = 0$

E. None of the above

Question 23

Solve $\frac{dy}{dt} = 2$, given initial value $y(0) = 5$

A. $2 + 5t$

B. $5 + 2t$

C. $2t$

D. $2y + 5t$

E. $5y + 2t$

Question 24

A card is selected at random from a deck of 52 cards. What is the probability that the card selected is a Queen or a Spade?

A. $\frac{1}{13}$

B. $\frac{1}{4}$

C. $\frac{4}{13}$

D. $\frac{1}{26}$

E. $\frac{1}{2}$

Question 25

Out of 50 consecutive natural numbers, two are chosen at random. What is the probability that the sum of the numbers is odd?

A. $\frac{1}{2}$

B. $\frac{1}{4}$

C. $\frac{12}{25}$

D. $\frac{25}{49}$

E. None of the above

Question 26

If sum of the roots of $ax^2 + bx + c = 0$ is equal to the sum of their squares then,

A. $2ab = ac + c^2$

B. $2ab = bc + c^2$

C. $2bc = ac + c^2$

D. $2bc = ab + b^2$

E. $2ac = ab + b^2$

Question 27

The distance between foci of the hyperbola $x^2 - y^2 = 16$ is

A. 8

B. $8\sqrt{2}$

C. $2\sqrt{8}$

D. 4

E. None of the above

Question 28

If the function $f(x) = \frac{ax+b}{(x-1)(x-4)}$ has a local maxima at $(2, -1)$, then

A. $b = 1, a = 0$

B. $a = 1, b = 0$

C. $b = -1, a = 0$

D. $a = -1, b = 0$

E. None of the above

Question 29

$x = \frac{1-\sqrt{y}}{1+\sqrt{y}}$ implies $\frac{dy}{dx}$ is equal to

A. $\frac{4}{(x+1)^2}$

B. $\frac{4(x-1)}{(1+x)^3}$

C. $\frac{x-1}{(1+x)^3}$

D. $\frac{4}{(x+1)^3}$

E. None of the above

Question 30

If $F(x) = f(g(x))$, where $f(-2) = 8, f'(-2) = 4, f'(5) = 3, g(5) = -2, g'(5) = 6$, find $F'(5)$

A. 24

B. 8

C. 12

D. 20

E. None of the above

Question 31

If $\int_{-1}^{4} f(x)dx = 4$ and $\int_{2}^{4}[3 - f(x)]dx = 7$, then the value of $\int_{-1}^{2} f(x)dx$ is

A. -2

B. 3

C. 5

D. 8

E. None of the above

Question 32

$\int_{-2}^{2} \left|1 - x^2\right| dx$ is equal to

A. 4

B. 2

C. -2

D. 0

E. None of the above

Question 33

Function $f(x) = 2 + 4x^2 + 6x^4 + 8x^6$ has

A. Many maxima and many minima

B. No maxima and no minima

C. Only one minima

D. Only one maxima

E. None of the above

Question 34

If $f'(x) = \sqrt{x}$ and $f(1) = 2$, then $f(x)$ is equal to

A. $\frac{3}{2}x^{\frac{3}{2}}$

B. $\frac{3}{2}x^{\frac{3}{2}} + \frac{4}{3}$

C. $\frac{2}{3}x^{\frac{3}{2}}$

D. $\frac{2}{3}x^{\frac{3}{2}} + \frac{4}{3}$

E. None of the above

Question 35

Suppose that there is a 6-sided die that is weighted in such a way that each time the die is rolled, the probabilities of rolling any of the numbers 1 to 5 are all equal but the probability of rolling a 6 is twice the probability of rolling a 1 . When you roll the dies once, the 6 outcomes are not equally likely. What is the probability of the most likely event?

A. 1/7

B. 2/7

C. 1/3

D. 1/6

E. 1/2

Question 36

Find the mean of the following probability distribution

X	8	12	16	20	24
$P(X)$	1/8	1/6	3/8	1/4	1/12

A. 20

B. 12

C. 16

D. 18

E. 24

Question 37

Let $y = \sqrt{(3 + 4x - x^2)}$. What is $\frac{dy}{dx}$?

A. $-2x + 4$

B. $\frac{1}{2\sqrt{(3+4x-x^2)}}$

C. $\frac{2-x}{-2x+4}$

D. $\frac{2-x}{y}$

E. None of the above

Question 38

Find $\frac{dy}{dx}$ for $y = e^{2x} \sin^2 3x$.

A. $2e^{2x} \sin 3x(\sin 3x + \cos 3x)$

B. $2e^{2x} \cos 3x(\sin 3x + \cos 3x)$

C. $2e^{2x} \sin 3x(\sin 3x + 3\cos 3x)$

D. $2e^{2x} \sin 3x(\sin 3x - 3\cos 3x)$

E. None of the above

Question 39

The equation $x^4 + y^4 + 9x - 6y = 14$ defines a curve passing through the point $A(1, 2)$. What is the equation of the tangent to the curve at A.

A. $y = -\frac{1}{2}x + \frac{5}{2}$

B. $y = \frac{1}{2}x - \frac{3}{2}$

C. $y = \frac{1}{2}x - \frac{5}{2}$

D. $y = -\frac{1}{2}x + \frac{4}{2}$

E. None of the above

Question 40

What is the solution set for the equation $x - 12 = \sqrt{x + 44}$.

A. $\{5\}$

B. $\{20\}$

C. $\{-5, 20\}$

D. $\{5, 20\}$

E. None of the above

Question 41

Do you think a firm operating in a competitive market should shutdown if its revenue is R = 1000 Rupees per week, its variable cost is VC = 500 Rupees, and its sunk fixed cost is F = 600 Rupees?

A. It should shutdown.

B. It should not shutdown.

C. It should shutdown if R is greater than VC.

D. It should shutdown if R is greater than F.

E. None of the above.

Question 42

Suppose that two linear demand curves go through the initial competitive market equilibrium, given by e*. One demand curve is less elastic than the other one at this equilibrium e. Can you say for which demand curve will a price increase cause the larger consumer surplus loss?

A. Consumer surplus loss is more for less elastic demand curve.

B. Consumer surplus loss is more for more elastic demand curve.

C. Consumer surplus loss is equal across demand curves.

D. Consumer surplus does not apply to competitive market equilibrium.

E. None of the above.

Question 43

Monopsony is a market with:

A. Many Sellers, Many Buyers

B. Single Seller, Many Buyers

C. Many Sellers, Single Buyer

D. Two Sellers, Two Buyers

E. None of the above.

Question 44

XYZ Satellite Company broadcasts TV to subscribers in Mumbai and Pune. The demand functions for each of these groups are $q_M = 60 - 0.25p_M$ and $q_p = 100 - 0.50p_p$, where q_M and q_p are in thousands of subscriptions per year in Mumbai and Pune respectively, and p_M and p_p are the subscription prices per year in Mumbai and Pune respectively. The cost of providing q units of service is given by $C = 1000 + 40q$, where $q = q_M + q_p$. The profit maximizing prices and quantities for Mumbai and Pune markets are:

A. $q_M = 25, q_P = 40; p_M = 140, p_P = 120$

B. $q_M = 25, q_P = 40; p_M = 120, p_P = 140$

C. $q_M = 40, q_P = 25; p_M = 140, p_P = 120$

D. $q_M = 60, q_P = 100; p_M = 140, p_P = 120$

E. None of the above.

Question 45

Well behaved Consumer preferences are:

A. Concave

B. Convex

C. Both Concave as well as Convex

D. Sine curve

E. None of the above.

Question 46

Lexicographic Preference Relation is:

A. Not a valid preference relation, but continuous

B. Valid preference relation, but not continuous

C. Not a valid preference relation, and also not continuous

D. Valid preference relation, but continuous

E. None of the above.

Question 47

Suppose there are two commodities x and y and that an economic agent's indifference curves are given by the equation of the form $y = \left(K - x^2\right)^{1/2}$ for different values of the parameter K. Can these preferences be represented by the Cobb-Douglas utility function?

A. No

B. Yes

C. There is nothing called a Cobb-Douglas utility function.

D. This has something to do with producer theory but has no relevance to consumer theory.

E. None of the above.

Question 48

Risk averse individuals are:

A. Willing to pay a risk premium

B. Are not willing to pay a risk premium

C. Are willing to accept risk premium

D. Are not willing to accept risk premium

E. None of the above.

Question 49

Given below is a table of the number of Televisions (TVs) purchased by a household and the marginal and total utility derived from these. Based on the table what is the marginal utility of the 4^{th} TV?

TVs	Total Utility	Marginal Utility
1	15	15
2	25	
3		7
4	37	

A. 10

B. 15

C. 7

D. 5

E. 37

Question 50

As compared to a perfectly competitive industry with the same costs, the equilibrium price for a monopoly would be

A. higher than the case of perfect competition, with equilibrium quantities being lower than in the case of perfect competition.

B. higher than the case of perfect competition, with equilibrium quantities too being higher than in the case of perfect competition.

C. lower than the case of perfect competition with equilibrium quantities being higher than in the case of perfect competition.

D. lower than the case of perfect competition with equilibrium quantities being lower than in the case of perfect competition.

E. lower than the case of perfect competition with equilibrium quantities being the same as in the case of perfect competition.

Question 51

If a fisherman must sell all of his/her daily catch before it spoils for whatever price (s)he is offered, once the fish are caught the fisher(wo)man's price elasticity of supply for fresh fish is

A. Zero

B. Infinite

C. One

D. Two

E. Unable to determine from this information

Question 52

When marginal costs are below average total costs,

A. average fixed costs are rising

B. average total costs are falling

C. average total costs are rising

D. average total costs are minimized

E. None of the above

Question 53

If there is no tax placed on the product in this market, consumer surplus is the area denoted by

A. C + D + F

B. A

C. $A + B + E$

D. D + C + B

E. D

Question 54

If there is no tax placed on the product in this market, producer surplus is the area

A. A + B + E

B. D

C. C + F

D. A + B + C + D

E. A

F. $C + F + D$

Question 55

If a tax is placed on the product in this market, tax revenue paid by the buyers is the area

A. B + C + E + F

B. B

C. B + C

D. A

E. E + F

Question 56

National income is nothing more than the sum of all individual incomes. With regard to national income accounts which of the following statements are false. a. In national income accounts income earned and income receipts are not identical concepts. b. In national income accounts capital gains are not counted as a part of income. c. An increase in inventories of only intermediate goods is counted as a part of national product.

A. a and b

B. b and c

C. a and c

D. c only

E. a only

Question 57

Consider a closed economy. Suppose we assume that $\tilde{i}$ + g [planned investment (which includes planned inventory accumulation) + govt. expenditure] are fixed i.e. they do not vary with income, and the sum of s+t (savings plus taxes) is positively related to income. For some reason people now desire to save more, which of the following statements would be true. a. s+t will be unchanged but income will fall. b. s+t will be unchanged and income will rise. c. s+t will rise and income will be unchanged.

A. a only

B. a and b

C. b and c

D. a and c

E. c only

Question 58

Equilibrium in the product market is represented by the IS curve. With respect to the equilibrium in the product market which of the following statements are true. a. The IS curve represents a causal relation between the rate of interest and income. b. The slope of the IS curve is influenced by the marginal propensity to consume. c. An increase in government expenditure shifts the IS curve to the right.

A. a only

B. a and b

C. b and c

D. a and c

E. c only

Question 59

Money is the stock of assets that can be readily used to make transactions. With respect to the various issues regarding the definition, measurement and evolution of money which of the following statements are true. a. Attempts by governments to reduce transaction costs and changes in technology largely explain the evolution of money in modern times. b. Disagreements about monetary policy sometimes arise because different measures of money may move in different directions. c. Widespread use of automatic teller machines in recent years has decreased the velocity of money.

A. a and b

B. b and c

C. a and c

D. a only

E. c only

Question 60

The national income accounts identity shows that the international flow of funds to finance capital accumulation and the international of goods and services are two sides of the same coin. In an open economy which of the following statements are false. a. Net exports (exports-imports) are always equal to output minus domestic spending. b. If savings are less than investment this reflects a trade surplus. C. If savings are less than investment this reflects the fact that net foreign investment is positive.

A. a and b

B. b and c

C. a and c

D. a only

E. b only

Question 61

Stabilization Policy is Public (Monetary and Fiscal) policy aimed at keeping output and employment at their natural rates. In this context consider a simple Keynesian Macroeconomic Model of a closed economy represented by the equilibrium conditions in the product market (downward sloping IS curve), money market (upward sloping LM curve), labour market and an aggregate production function. Suppose at the initial equilibrium the government believes that unemployment rate is far above its natural rate and so it decides to increase money supply keeping government expenditure and tax rates at the initial level. In this context which of the following statements would be true? a. Investment in the new equilibrium will necessarily be lower than in the initial equilibrium. b. Both employment and output are higher in the new equilibrium. c. With a given slope of the IS curve, the increase in money supply will have a greater effect on output at higher levels of the interest rate compared to very low levels of the interest rate.

A. a and b

B. b and c

C. a and c

D. a only

E. conly

Question 62

Consider a small open economy with perfect capital mobility and floating exchange rates (a system where the exchange rate is allowed to fluctuate freely in response to changing economic conditions). The exchange rate is defined as the amount of foreign currency per unit of domestic currency and both domestic and foreign price levels are assumed to be fixed. Suppose the government initiates an expansionary fiscal policy by increasing government expenditures. Which of the following statements would be true? a. The domestic currency appreciates. b. The new equilibrium output is higher than the initial equilibrium output. c. The fiscal expansion causes a reduction in national savings.

A. a and b

B. *b* and *c*

C. a and c

D. a only

E. c only

Question 63

Discounting refers directly to

A. finding the present value of a future sum of money.

B. finding the future value of a present sum of money.

C. calculations that ignore the phenomenon of compounding for the sake of ease and simplicity.

D. decreases in interest rates over time, while compounding refers to increases in interest rates over time.

E. none of the above.

Question 64

A production possibilities frontier is a straight line when

A. the more resources the economy uses to produce one good, the fewer resources it has available to produce the other good.

B. an economy is interdependent and engaged in trade instead of self-sufficient.

C. the rate of tradeoff between the two goods being produced is constant.

D. the rate of tradeoff between the two goods being produced depends on how much of each good is being produced.

E. none of the above.

Question 65

For an imaginary economy, the value of the consumer price index was 140 in 2013 , and the inflation rate was 5.0 percent between 2013 and 2014. The consumer price index in 2014 was

A. 145.0.

B. 147.0.

C. 135.0.

D. 133.3.

E. none of the above.

Question 66

Net capital outflow equals

A. the value of domestic assets purchased by foreigners.

B. the value of foreign assets purchased by domestic residents.

C. the value of domestic assets purchased by foreigners - the value of foreign assets purchased by domestic residents.

D. the value of foreign assets purchased by domestic residents - the value of domestic assets purchased by foreigners.

E. none of the above.

Question 67

A U.S. firm buys bonds issued by a technology center in India. This purchase is an example of U.S.

A. foreign portfolio investment. By itself it is an increase in U.S. holdings of foreign bonds and increases U.S. net capital outflow.

B. foreign portfolio investment. By itself it is an increase in U.S. holdings of foreign bonds and decreases U.S. net capital outflow.

C. foreign direct investment. By itself it is an increase in U.S. holdings of foreign bonds and increases U.S. net capital outflow.

D. foreign direct investment. By itself it is an increase in U.S. holdings of foreign bonds and decreases U.S. net capital outflow.

E. none of the above.

Question 68

Which of the following reduces the interest rate?

A. an increase in government expenditures and an increase in the money supply

B. an increase in government expenditures and a decrease in the money supply

C. a decrease in government expenditures and an increase in the money supply

D. a decrease in government expenditures and a decrease in the money supply

E. none of the above.

Question 69

Which of the following is not correct?

A. In the short run, policymakers face a tradeoff between inflation and unemployment.

B. Events that shift the long-run Phillips curve right shift the long-run aggregate supply curve left.

C. Unemployment can be changed only by the use of government policy.

D. The decrease in output associated with reducing inflation is less if the policy change is announced ahead of time and is credible.

E. none of the above.

Question 70

Suppose the economy is in long-run equilibrium. In a short span of time, there is an increase in the money supply, a tax decrease, a pessimistic revision of expectations about future business conditions, and a rise in the value of the dollar. In the short run, we would expect

A. the price level and real GDP both to rise.

B. the price level and real GDP both to fall.

C. the price level and real GDP both to stay the same.

D. All of the above are possible.

E. none of the above.

Question 71

A linearly ordered set is said to be Well-ordered if every nonempty subset of it has a:

A. Least element

B. Maximal element

C. Positive element

D. Negative element

E. None of the above

Question 72

Take a set S and a point s. Consider the following two statements. For every $\varepsilon > 0$, S contains infinitely many points of $(s - \varepsilon, s + \varepsilon)$ For every $\varepsilon > 0$, S contains a point other than s of $(s - \varepsilon, s + \varepsilon)$. These two statements are:

A. Contradictory

B. Not related to one other

C. Equivalent

D. Illogical

E. None of the above.

Question 73

The intersection of any finite collection of open sets is:

A. Open

B. Closed

C. Both Open and Closed

D. Empty

E. None of the above

Question 74

A set and its inverse image _____cardinality. The blank is filled with:

A. Need to have the same

B. Need to have positive

C. Need not have the same

D. Need to have negative

E. None of the above.

Question 75

If every continuous, real valued function defined on a set has the intermediate value property on that set, then it is:

A. Convex

B. Complete

C. Connected

D. Compact

E. None of the above.

Question 76

The only connected subsets of the rational numbers are sets with:

A. One element

B. Two elements

C. Three elements

D. Infinite elements

E. None of the above.

Question 77

If f: A $\rightarrow$ **R** is continuous and A is compact, then f is:

A. Discontinuous on A

B. Discontinuous on **R**

C. Continuous on **R** − A

D. Uniformly continuous on A

E. None of the above.

Question 78

A set is _____and _____if and only if it has the covering property. The blanks are:

A. Open, Closed

B. Closed, Complete

C. Closed, Unbounded

D. Closed, Bounded

E. None of the above.

Question 79

The list of vectors $(1, 2, 3), (4, 5, 8), (9, 6, 7), (-3, 2, 8)$ is:

A. linearly independent in R^3

B. not linearly independent in R^3

C. linearly dependent in R^2

D. not linked to linear dependence or independence

E. None of the above.

Question 80

A matrix is called upper triangular if

A. all the entries below the diagonal equal zero

B. all entries below the diagonal do not equal zero

C. all entries above the diagonal equal zero

D. all entries above the diagonal do not equal zero

E. None of the above.

Question 81

The differential equation $\left(x^2 - 3y^2\right) dx + 2xydy = 0$ is:

A. first order nonhomogeneous.

B. first order homogeneous.

C. second order non-homogeneous.

D. second order homogeneous.

E. None of the above.

Question 82

What is the maximum value of $f(x, y) = x^2 y$ given that $x^2 + y^2 = 1$?

A. $\frac{4}{27}\sqrt{3}$

B. $\frac{\sqrt{3}}{9}$

C. $\frac{\sqrt{2}}{3}$

D. $\frac{2}{3}$

E. None of the above

Question 83

A new brand of disposable flashlight (torch) is guaranteed to last for at least one year of normal use. Tests indicate that the lifetime of these lights under normal use is approximately normally distributed with a mean of 1.5 years and a standard deviation of 0.4 year. What proportion of flashlights will fail to meet the guarantee? [Note: $F(.)$ is the cumulative distribution function associated with the standard normal distribution. (i.e. normal with mean 0 and standard deviation 1)].

A. $F(1.25)$

B. $F(-1.25)$

C. $[1 - F(1.25)]$

D. $[1 - F(-1.25)]$

E. None of the above

Question 84

$\sum_{n=1}^{\infty} \frac{1}{2n(2n+1)}$ =?

A. $\frac{1-\log 2}{1+\log 2}$

B. $\frac{1+\log 2}{1-\log 2}$

C. $1 + \log 2$

D. 1 -log 2

E. None of the above

Question 85

The property common to the following functions $f(x) = \sin(1/x)$ and $g(x) = 1/x$ is that:

A. both are discontinuous at zero

B. both are oscillating

C. both are bounded

D. both are continuous at zero

E. None of the above

Question 86

If $a + 2b + 3c = 7x$, then

A. $a^2 + b^2 + c^2 = (x - a)^2 + (2x - b)^2 + (3x - c)^2$

B. $a^2 + b^2 + c^2 = (x - a)^2 + (x - b)^2 + (x - c)^2$

C. $a^3 + b^3 + c^3 = (x - a)^3 + (2x - b)^3 + (3x - c)^3$

D. $a^2 + b^2 + c^2 = (x + a)^2 + (2x + b)^2 + (3x + c)^2$

E. None of the above

Question 87

Simplify $\log_2 8 + \log_2 2$

A. $\log_2 10$

B. $\log_2 4$

C. 4

D. 5

E. 6

Question 88

A line L is parallel to the line $x + 2y = 6$ and passes through the point $(10, 1)$. Find the area of the region bounded by the line L and the axes

A. 16 sq. units

B. 25 sq units

C. 49 sq units

D. 36 sq. units

E. None of the above

Question 89

Find the equation of tangent to the circle $(x-4)^2+(y-2)^2 = 16$ at point $(4+2\sqrt{2}, 2+2\sqrt{2})$ and the other tangent that is parallel to it.

A. $y = -x + 6 + 4\sqrt{2}, \quad y = -x - 6 - 4\sqrt{2}$

B. $y = x + 6 + 4\sqrt{2}, \quad y = x + 6 - 4\sqrt{2}$

C. $y = -x + 6 + 2\sqrt{2}, \quad y = -x + 6 - 2\sqrt{2}$

D. $y = -x + 6 + 4\sqrt{2}, \quad y = -x + 6 - 4\sqrt{2}$

E. None of the above

Question 90

If the area of an equilateral triangle is x square meters and the perimeter is x meters, then what is the length of one side of the triangle in meters?

A. 6

B. 8

C. $4\sqrt{2}$

D. $2\sqrt{3}$

E. $4\sqrt{3}$

Question 91

For all numbers x, the operation <> is defined is defined by $< x >= x - \frac{x}{5}$. If $\ll W \gg = 32$, then what is the value of W ?

A. 15

B. 25

C. 35

D. 50

E. 60

Question 92

If points $(0, -3)$, $(6, 0)$ and $(k, 10)$ all lie on the same line, what is the value of k ?

A. 2

B. 8

C. 14

D. 22

E. 26

Question 93

For $y = 3^{x^2}$, obtain $\frac{dy}{dx}$.

A. $3^{x^2} x \log(9)$

B. $3^{x^2+x} \log 3$

C. $3^{x^2} 2 \log(3)$

D. $3^{x^2+x} 2$

E. None of the above

Question 94

Perpendiculars are drawn from points on the line $\frac{x+2}{2} = \frac{y+1}{-1} = \frac{z}{3}$ to the plane $x + y + z = 3$. The feet of the perpendiculars lie on the line

A. $\frac{x}{5} = \frac{y-1}{8} = \frac{z-2}{-13}$

B. $\frac{x}{2} = \frac{y-1}{3} = \frac{z-2}{-5}$

C. $\frac{x}{4} = \frac{y-1}{3} = \frac{z-2}{-7}$

D. $\frac{x}{2} = \frac{y-1}{-7} = \frac{z-2}{5}$

E. None of the above

Question 95

The area enclosed by the curves $y = \sin x + \cos x$ and $y = |\cos x - \sin x|$ over the interval $\left[0, \frac{\pi}{2}\right]$ is

A. $4(\sqrt{2}-1)$

B. $2\sqrt{2}(\sqrt{2}-1)$

C. $2(\sqrt{2}+1)$

D. $2\sqrt{2}(\sqrt{2}+1)$

E. None of the above

Question 96

Solve the second order differential equation $\frac{d^2y}{dx^2} + 2\frac{dy}{dx} + 10y = 3e^{2x}$ given that when $x = 0, y = 1$ and $\frac{dy}{dx} = 0$

A. $e^{-x}\left(e^{3x} + \sin(3x) + 5\cos(3x)\right)$

B. $\frac{1}{6}e^{-x}\left(e^{3x} + \sin(3x) + 5\cos(3x)\right)$

C. $\frac{1}{6}e^{-x}(\sin(3x) + 5\cos(3x))$

D. $\frac{1}{6}e^{-x}\left(e^{3x} + 5\sin(3x) + 5\cos(3x)\right)$

E. None of the above

Question 97

Solve $2x - x^2 \geq |x-1| - 1$

A. $[0, 3]$

B. $[-1, 0]$

C. $[0, 2]$

D. $[-1, 2]$

E. None of the above

Question 98

The sum of first twenty terms of an arithmetic sequence is 320 . The twenty-first term is 37 . What is the sum of first ten terms?

A. 60

B. 50

C. 40

D. 30

E. None of the above

Question 99

Simplify using binomial theorem $\left(\frac{x^2}{3} - \frac{2}{x}\right)^5$

A. $\frac{x^{10}}{243} - \frac{10x^7}{81} - \frac{32}{x^5} + \frac{40x^4}{27} + \frac{40x^3}{18} + \frac{80}{3x^2} - \frac{80x}{9}$

B. $\frac{x^{10}}{243} - \frac{10x^7}{81} - \frac{32}{x^5} + \frac{40x^4}{27} + \frac{80}{3x^2} + \frac{80x}{9}$

C. $\frac{x^{10}}{243} - \frac{10x^7}{81} - \frac{32}{x^5} + \frac{40x^4}{27} + \frac{80}{3x^2} - \frac{80x}{9}$

D. $\frac{x^{10}}{243} - \frac{10x^7}{81} - \frac{32}{x^5} - \frac{40x^4}{27} - \frac{80}{3x^2} - \frac{80x}{9}$

E. None of the above

Question 100

What is the value of y in the following system

$$x + 2y + 3z = 2$$
$$x + y - z = 0$$
$$2x + 2y - z = 1$$

A. -2

B. -1

C. 0

D. 1

E. 2

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Question 1

If A is a square matrix of order n, then Det(kA) = ?

A. k · Det(A)

B. n.k.Det(A)

C. n^k Det(A)

D. k^2 Det(A)

E. k^n Det(A)

Question 2

Solve the equation $|4x + 23| = |4x - 9|$?

A. $x = 0$

B. $x = 8$

C. $x = \frac{7}{4}$

D. $x = -\frac{7}{4}$

E. indeterminate

Question 3

The common region represented by the following inequalities is _____$3x + 5y \leq 15$ $5x + 2y \leq 10$ $x \geq 0$ $y \geq 0$

A. a triangle

B. a quadrilateral

C. a pentagon

D. a rectangle

E. a square

Question 4

The matrix $A = \begin{bmatrix} -2 & 2 \\ 2 & -2 \end{bmatrix}$ is

A. positive definite

B. negative definite

C. positive semi definite

D. negative semi definite

E. indefinite

Question 5

The particular solution of the differential equation $\frac{dy}{dt} - y - t^2 = 0$ is

A. $-t^2$

B. $t^2 - 2t$

C. $t^2 + 2t + 2$

D. $t^2 + 2t$

E. Other than the given options

Question 6

The solution of the equation $dy - (1 + x + y + xy)dx = 0$, where $y > 0$, is = ?

A. $\log y = x + c$

B. $\log(1 + y) = \frac{x^2}{2} + x + c$

C. $\log(1 + y) = x + c$

D. $\log(1 + y) = x^2 + c$

E. $\log y = \frac{x^2}{2} + c$

Question 7

The general solution of $\frac{dx}{dt} + 2x = c$ is

A. 2

B. e^{-t}

C. $2t$

D. 2^t

E. Ae^{-2t}

Question 8

The maximum value of $f(x) = \frac{x}{4+x+x^2}$ on $[-1, 1]$ is:

A. $\frac{-1}{4}$

B. $\frac{-1}{3}$

C. $\frac{1}{6}$

D. $\frac{1}{7}$

E. None of the above

Question 9

If $x \log x + y \log y = 1$, then $\frac{dy}{dx}$ is equal to

A. $-\frac{\log x}{\log y}(2) - \frac{\log ex}{\log ey}$

B. $\frac{\log x}{\log y}$

C. $\frac{\log y}{\log x}$

D. None of the above

Question 10

The value of $\frac{d}{dx}(|x - 1| + |x - 5|)$ at $x = 3$ is

A. -2

B. 0

C. 2

D. 4

E. 5

Question 11

$\int 2^x 3^{x+1} 4^{x+2} dx =$

A. $\frac{(48)^x}{\log 48}$

B. $\int \frac{2^x 3^{x+1} 4^{x+2}}{\log 2 + \log 4 + \log 3}$

C. $\frac{(24)^{x+2}}{\log 24}$

D. $\int \frac{2^{x+1} 3^{x+2} 4^{x+3}}{\log 2 + \log 4 + \log 3}$

E. None of the above

Question 12

If $\int \frac{1}{f(x)} dx = \log\{f(x)\}^2 + c$, then $f(x) =$

A. $x + a$

B. $2x + a$

C. x/2 + a

D. $x^2 + a$

E. $x/4 + a$

Question 13

If $f(x) = \begin{cases} |x| & -1 \leq x \leq 1 \\ |x-2| & 1 < x \leq 3 \end{cases}$ then, $\int_{-1}^{3} f(x) dx$ is equal to

A. 0

B. 1

C. 2

D. 4

E. -1

Question 14

$\int_0^1 x(1-x)^n dx =$

A. $\frac{n(n+1)}{2}$

B. $\frac{1}{(n+1)(n+2)}$

C. $\frac{(n+1)(n+2)}{3}$

D. $n^2(n+1)$

E. None of the above

Question 15

There are 35 students in art class and 57 students in dance class. Find the number of students who are either in art class or in dance class. (a) When two classes meet at different hours and 12 students are enrolled in both activities. (b) When two classes meet at the same hour.

A. 47; 69

B. 12; 47

C. 69; 23

D. 80; 92

E. 45; 22

Question 16

Each student in a class of 40 plays at least one indoor game: chess, carrom and scrabble. 18 play chess, 20 play scrabble and 27 play carrom. 7 play chess and scrabble, 12 play scrabble and carrom and 4 play chess, carrom and scrabble. Find the number of students who play chess and carrom.

A. 10

B. 69

C. 19

D. 50

E. 40

Question 17

The partial sums of the first n and n + 1 numbers of the Fibonacci sequence are both divisible by 11. What is the smallest value of n for which this is true?

A. 11

B. 9

C. 8

D. 12

E. 10

Question 18

An arithmetic sequence has its 5 th term equal to 22 and its 15 th term equal to 62 . Find its 100 -th term.

A. 210

B. 402

C. 305

D. 510

E. 406

Question 19

Find the sum of the first 50 even positive integers.

A. 2550

B. 4210

C. 3270

D. 5320

E. 3080

Question 20

Find the value of n for which the following equation is true: $\sum_{i=1}^{n}(0.25i + 2) = 21$.

A. 7

B. 24

C. 10

D. 32

E. 12

Question 21

Find the sum of the following infinite series $\frac{1}{4} + \frac{1}{16} + \frac{1}{64} + \frac{1}{256} + \ldots$

A. 1/3

B. 1/2

C. 3/4

D. ∞

E. 1

Question 22

Let X be a variable with a binomial distribution, n = 25 and p = 0.3. Which of the following statements is true?

A. The mean of X is 7.5 and variance is 5.25

B. The mean of X is 7.5 and variance is 0.21

C. The mean of X is 5 and variance is 0.09

D. The mean of X is 0.75 and variance is 1

E. Not listed in the answers.

Question 23

Find the mean of the following probability distribution

X	16	18	24	28	36
P(X)	1/8	1/6	3/8	1/4	1/12

A. 20

B. 22

C. 24

D. 26

E. Not listed above

Question 24

Two dice are thrown simultaneously. What is the probability of getting two numbers whose product is even?

A. 1/2

B. 3/4

C. 3/8

D. 5/16

E. Not listed here

Question 25

Find $\frac{dy}{dx}$ for $y = 2^{\cot x}$.

A. $-2^{\cot x} \ln 2$

B. $-2^{\cot x} \ln 2 \left(\sec^2 x\right)$

C. $-2^{\cot x} \ln 2 \left(\operatorname{cosec}^2 x\right)$

D. $2^{\cot x} \ln 2 \left(\operatorname{cosec}^2 x\right)$

E. None of the above

Question 26

Find $\frac{dy}{dx}$ for $y = \cos^2\left(x^3\right)$.

A. $-6x^2 \cos\left(x^3\right) \sin\left(x^3\right)$

B. $-6x^2 \cos\left(x^3\right) \sin^2\left(x^3\right)$

C. $6x^2 \cos\left(x^3\right) \sin\left(x^3\right)$

D. $-6x^2 \cos\left(x^3\right) \sin x$

E. None of the above

Question 27

Evaluate $\int x^2 e^{3x} dx$

A. $\frac{x^2 e^{3x}}{3} - \frac{2xe^{3x}}{9} + \frac{e^{3x}}{27} + c$

B. $\frac{x^2 e^{3x}}{3} - \frac{2xe^{3x}}{9} + \frac{2e^{3x}}{27} + c$

C. $\frac{x^2 e^{3x}}{3} - \frac{2xe^{3x}}{9} + \frac{2e^{3x}}{9} + c$

D. $\frac{x^2 e^{3x}}{3} - \frac{2xe^{3x}}{9} + \frac{2e^{x}}{27} + c$

E. None of the above

Question 28

Evaluate $\int \frac{\ln x}{x^5} dx$

A. $-\frac{\ln x}{4x^4} + \frac{1}{16x^4} + c$

B. $\frac{\ln x}{4x^4} - \frac{1}{16x^4} + c$

C. $-\frac{\ln x}{4x^4} - \frac{1}{16x^3} + c$

D. $-\frac{\ln x}{4x^4} - \frac{1}{16x^4} + c$

E. None of the above

Question 29

Determine which of the following is true. $f(x) = \begin{cases} 3x - 5 \text{ if } x \neq 1 \\ 2 \text{ if } x = 1 \end{cases}$

A. f is continuous at $x = 1$.

B. f is not continuous at $x = 1$

C. f is not continuous at $x = 2$

D. f is not continuous at $x = 0$

E. None of the above

Question 30

Evaluate $\lim_{x \to 0} \frac{3^x - 2^x}{x^2 - x}$.

A. $\ln 3 - \ln 2$

B. $\ln 2 - \ln 3$

C. $\ln 2$

D. 5

E. $\ln 3$

Question 31

Find the odd man out. $1, 5, 11, 17, 23, 29$.

A. 29

B. 11

C. 17

D. 1

E. 23

Question 32

Which equation has infinitely many solutions?

A. $x = \frac{1}{4}x + \frac{3}{4}$

B. $\frac{1}{3}x - 5 = \frac{2}{3}x - 5$

C. $\frac{1}{2}(1 + 4x) = 2x - 3$

D. $3 - 4x = -6\left(\frac{2}{3}x - \frac{1}{2}\right)$

E. None of the above

Question 33

If $a * b = 2a - 4b + 2ab$, then $2 * 3 + 3 * 2 = ?$

A. 6

B. 8

C. 12

D. 14

E. 10

Question 34

$b - [b - (a + b) - \{b - (b - a + b)\} + 2a] = ?$

A. 0

B. $4a$

C. a

D. $-2a$

E. None of the above

Question 35

Glen spends a total of 9 hours writing a paper and finishing a project. He spends x hours on the paper and y hours finishing the project. Glen spends $1\frac{1}{2}$ more hours on the paper than he spends on the project. How many hours does Glen spends writing the paper?

A. $3\frac{1}{4}$ hours

B. $3\frac{3}{4}$ hours

C. $5\frac{1}{4}$ hours

D. $5\frac{3}{4}$ hours

E. None of the above

Question 36

Assume $h(x) = f(g(x))$, where both f and g are differentiable functions.. If $g(-1) = 2$, $f(2) = -4, g'(-1) = 3$. What is $h'(-1)$?

A. 6

B. 8

C. -12

D. 12

E. -10

Question 37

Evaluate $\int (\ln x)^2 dx$

A. $x(\ln x)^2 - 2x \ln x + c$

B. $(\ln x)^2 - 2x \ln x + 2x + c$

C. $x(\ln x)^2 - 2x \ln x + 2x + c$

D. $x(\ln x)^2 - 2 \ln x + 2x + c$

E. None of the above

Question 38

Tickets numbered 1 to 20 are mixed up and then a ticket is drawn at random. What is the probability that the ticket drawn has a number which is a multiple of 3 or 5 ?

A. 0.55

B. 0.35

C. 0.53

D. 0.45

E. 0.25

Question 39

The exam grades of 7 students are: $70, 66, 72, 96, 46, 90, 50$. What is the sample standard deviation?

A. 18.6

B. 20.1

C. 17.5

D. 19.2

E. 21.4

Question 40

In a box, there are 8 red, 7 blue and 6 green balls. One ball is picked up randomly. What is the probability that it is neither red nor green? (Answers have been rounded off to two decimal points)

A. 0.33

B. 0.75

C. 0.37

D. 0.38

E. 0.43

Question 41

If a country allows trade and, for a certain good, the domestic price without trade is higher than the world price,

A. the country will be an exporter of the good.

B. the country will be an importer of the good.

C. the country will be neither an exporter nor an importer of the good.

D. Additional information is needed about demand to determine whether the country will be an exporter of the good, an importer of the good, or neither.

E. None of the above

Question 42

When a country saves a larger portion of its GDP than it did before, it will have

A. more capital and higher productivity.

B. more capital and lower productivity.

C. less capital and higher productivity.

D. less capital and lower productivity.

E. None of the above

Question 43

In the long run the unemployment rate equals

A. zero.

B. the cyclical rate of unemployment.

C. the natural rate of unemployment.

D. the sum of the cyclical and natural rate of unemployment.

E. None of the above

Question 44

Suppose that more British decide to vacation in the U.S. and that the British purchase more U.S. Treasury bonds. Ignoring how payments are made for these purchases,

A. the first action by itself raises U.S. net exports, the second action by itself raises U.S. net capital outflow.

B. the first action by itself raises U.S. net exports, the second action by itself lowers U.S. net capital outflow.

C. the first action by itself lowers U.S. net exports, the second action by itself raises U.S. net capital outflow.

D. the first action by itself lowers U.S. net exports, the second action by itself lowers U.S. net capital outflow.

E. None of the above

Question 45

Which of the following would cause the real exchange rate of the U.S. dollar to depreciate?

A. the U.S. government budget deficit decreases

B. capital flight from foreign countries

C. the U.S. imposes import quotas

D. the U.S. government budget deficit increases

E. None of the above.

Question 46

Suppose the economy is in long-run equilibrium. In a short span of time, there is a sharp rise in the stock market, an increase in government purchases, an increase in the money supply and a decline in the value of the dollar. In the short run

A. the price level and real GDP will both rise.

B. the price level and real GDP will both fall.

C. neither the price leave nor real GDP will change.

D. All of the above are possible.

E. None of the above is possible.

Question 47

Which of the following reduces the interest rate?

A. an increase in government expenditures and an increase in the money supply

B. an increase in government expenditures and a decrease in the money supply

C. a decrease in government expenditures and an increase in the money supply

D. a decrease in government expenditures and a decrease in the money supply

E. None of the above.

Question 48

One important category of expenditure in national income accounting is investment. Consider the following events: a. Rahul buys himself a 100 year-old colonial era house. b. Ritu builds herself a brand-new contemporary house. c. Mukesh Ambani buys Rs 50 crore in Tata stock from Cyrus Mistry on the National Stock Exchange. d. Hindustan Motors sells Rs10 crore in stock to the public and uses the proceeds to build a new car factory. Which of these events will be counted as investment in India's national accounts?

A. a and c

B. b and d

C. a and b

D. c and d

E. d only

Question 49

In an IS-LM framework, monetary policy is ineffective in increasing output in which of the following cases? a. The IS curve is downward sloping and LM curve is upward sloping, b. The IS curve is downward sloping and LM curve is vertical, c. The IS curve is vertical and LM curve is upward sloping, d. The IS curve is horizontal and the LM curve is upward sloping

A. a

B. *b*

C. c

D. d

E. None of the above

Question 50

A stimulative fiscal policy combined with a restrictive monetary policy will necessarily cause which of the following: a. Gross domestic product to increase b. Gross domestic product to decrease c. Interest rates to fall e. The government budget deficit to decrease

A. a only

B. d only

C. d and e

D. c only

E. e only

Question 51

Consider a small open economy facing an unchanged world real interest rate. The government of this economy increases its purchases. Which of the following is true? a. National saving decreases. b. National saving increases. c. Investment remains the same. d. Investment increases.

A. a and c

B. *b* and *c*

C. a and d

D. b and d

E. d only

Question 52

The purchase of bonds by the Reserve Bank of India will have the greatest effect on real gross domestic product if which of the following situations exists in the economy? a. The required reserve ratio is high, and the interest rate has a large effect on investment spending. b. The required reserve ratio is high, and the interest rate has a small effect on investment spending. c. The required reserve ratio is low, and the interest rate has a large effect on investment spending. d. The required reserve ratio is low, and the marginal propensity to consume is low. e. The marginal propensity to consume is high, and the interest rate has a small effect on investment spending.

A. a and e

B. only b

C. b and e

D. d and e

E. c only

Question 53

Let's say the government of India prohibits the import of foreign cars. Which of the following is true? a. Real exchange rate depreciates. b. Real exchange rate appreciates c. Net exports remain unchanged. d. Net exports increase

A. a and c,

B. a and d,

C. b and d,

D. b and c

E. c only

Question 54

Which of the following policy options will lead to an increase in money supply? a. The Reserve Bank of India reduces the reserve requirements on demand and time deposits of commercial banks. b. The Reserve Bank of India buys Government Securities through open market operation. c. The Reserve Bank of India sells Government Securities through open market operation.

A. a only

B. b only

C. c only

D. b and c

E. a and b

Question 55

Consider a small open economy with perfect capital mobility and flexible exchange rates. Which of the following statements would be true? a. Expansionary monetary policy is effective b. Increase in government expenditure leads to depreciation in domestic currency c. Expansionary fiscal policy is effective d. Increase in money supply leads to appreciation in domestic currency

A. a and d,

B. a only,

C. b and c,

D. conly,

E. d only

Question 56

For the demand function $Q_d = 286 - 20p$, calculate price elasticity of demand at $p = 3, Q = 226$.

A. 0.014

B. 0.10

C. 0.05

D. 0.26

E. 0.5

Question 57

Assume that utility function of a consumer is given by $U_i(x, y) = -(x-1)^2 - (y-1)^2$. Prices of goods x, y are $p_x = p_y = 1$ and income earned $M = 10$. Solve for the consumer's optimal bundle.

A. $x^* = 1, y^* = 1$

B. $x^* = 5, y^* = 5$

C. $x^* = 1, y^* = 10$

D. $x^* = 10, y^* = 0$

E. $x^* = 0, y^* = 10$

Question 58

Given the production function $Q = \min\left\{\frac{K}{1}, \frac{L}{2}\right\}$ and prices of inputs of capital, K, and labour, L $w = r = 1$, solve for the firm's optimal input bundle for producing output $Q = 10$.

A. $K^* = 20, L^* = 10$

B. $K^* = 10, L^* = 10$

C. $K^* = 10, L^* = 0$

D. $K^* = 10, L^* = 20$

E. $K^* = 20, L^* = 20$

Question 59

(Third degree price discrimination) A monopolist is able to separate the demand for its product into two separate markets. The own-price demand curves for markets one and two are respectively $Q_1^D = 1000 - 4P$ and $Q_2^D = 1200 - 4P$. The total cost curve for the firm is given by: $SRTC = 100 + 0.25Q^2$, where $Q = Q_1 + Q_2$ Find the quantity sold in each market assuming that the monopolist maximizes profits.

A. $Q_1 = \frac{400}{3}, Q_2 = \frac{700}{3}$

B. $Q_1 = \frac{200}{3}, Q_2 = \frac{1100}{3}$

C. $Q_1 = \frac{500}{3}, Q_2 = \frac{1000}{3}$

D. $Q_1 = \frac{100}{3}, Q_2 = \frac{800}{3}$

E. $Q_1 = \frac{200}{3}, Q_2 = \frac{1300}{3}$

Question 60

Find all the pure strategy Nash equilibrium or equilibria in the following simultaneous game, in which player 1 has three strategies, T, M, B, while player 2 has three strategies L, C and R. The payoff matrix is as follows:

		Player 2	
	L	C	R
T	(2, 0)	(1, 1)	(4, 2)
M	(3, 4)	(1, 2)	(2, 3)
B	(1, 3)	(0, 2)	(3, 0)

A. (M, C) and (B, L)

B. (T, L) and (B, C)

C. Only (B, L)

D. (B, R) and (M, R)

E. (T, R) and (M, L)

Question 61

Each firm in a competitive market has a cost function of $C = 2q^2 + 10$. The market demand function is $Q = 24 - p$, while the market supply function is given by $Q = 12 + 2p$. Solve for the output chosen by each firm in order to maximize profit.

A. $q^* = 10$

B. $q^* = 20$

C. $q^* = 1$

D. $q^* = 4$

E. $q^* = 15$

Question 62

Asa buys a painting. There's a 20% probability that the artist will become famous and the painting will be worth Rs 5000 . There's a 5% probability that the painting will be destroyed in a fire or some other disaster. If the painting is not destroyed and the artist does not become famous, it will be worth Rs 400 . What is the expected value of the painting?

A. Rs 2500

B. Rs 600

C. Rs 1000

D. Rs 1300

E. Rs 1600

Question 63

Which of the following statements is/are true A. If an economy is operating on its production possibilities frontier, it must produce less of one good if it produces more of another. B. Points outside the production possibilities frontier are attainable but inefficient. C. The production possibilities frontier is bowed outward because the trade-offs between the production of any two goods are constant.

A. Only A

B. Only B

C. Only C

D. A, B and C

E. All are false

Question 64

If there is excess capacity in a production facility, it is likely that the firm's supply curve is

A. Price inelastic

B. None of these answers

C. It could be anything, cannot say anything about it.

D. Unit price elastic

E. Price elastic

Question 65

Suppose that the price of a new bicycle is Rs.3000. A student values a new bicycle at Rs.4000. It costs Rs.2000 for the seller to produce the new bicycle. What is the value of total surplus if the student buys a new bicycle?

A. Rs.5000

B. Rs.3000

C. Rs.4000

D. Rs. 2000

E. Rs.1000

Question 66

Producer surplus is the area

A. below the supply curve and above the price

B. below the demand curve and above the supply curve

C. below the demand curve and above the price

D. above the demand curve and below the price

E. above the supply and below price.

Question 67

When marginal costs are below average total costs,

A. average fixed costs are rising

B. average total costs are falling

C. average total costs are rising

D. average total costs are minimized

E. None of the above

Question 68

For a price ceiling to be binding constraint to the market, the government needs to set it

A. above the equilibrium price

B. below the equilibrium price

C. at the equilibrium price

D. at any price

E. there is not enough information to tell

Question 69

Compared to a perfectly competitive market, a monopoly market will usually generate

A. Higher prices and lower output

B. Higher prices and higher output

C. Lower prices and lower output

D. Lower prices and higher output

E. Higher prices, but higher or lower output depending on efficiency of the monopolist

Question 70

Which of the following is true, based on the figure below

A. The buyers pay a larger portion of the tax because demand is more inelastic than supply.

B. The sellers pay a larger portion of the tax because supply is more elastic than demand.

C. The buyers pay a larger portion of the tax because demand is more elastic than supply.

D. The sellers pay a larger portion of the tax because supply is more inelastic than demand.

E. None of the above

Question 71

Let x and y be the sides of 2 squares respectively such that $y = x^2 + x$. Find the rate of change of the area of the second square with respect to area of first square.

A. $2x^2 + 1$

B. $2x^2 + 3x + 1$

C. $3x^2 + 1$

D. $2x^2 + 6x + 1$

E. $2x^2 + 9x + 1$

Question 72

The function $f(x) = \sin x + \tan x - 2x$ is increasing in the interval . . . ?

A. $(0, \pi)$

B. $\left(0, \frac{\pi}{2}\right)$

C. $\left(\frac{\pi}{2}, \pi\right)$

D. $\left(\frac{\pi}{4}, \frac{\pi}{2}\right)$

E. Other than the given options

Question 73

If Rolle's theorem holds for the function $y = x^3 + bx^2 + cx, x \in [1, 2]$ at the point $x = \frac{4}{3}$ then the values of ' b ' and ' c ' are

A. $b = 5$ and $c = -5$

B. $b = -5$ and $c = -8$

C. $b = -5$ and $c = 8$

D. $b = 5$ and $c = 0$

E. $b = 0$ and $c = -5$

Question 74

Let f and g have continuous first and second derivatives everywhere. If $f(x) \leq g(x)$ for all real x, which of the following must be true? I. f'(x) $\leq$ g'(x) for all real x II. f'(x) $\leq$ g''(x) for all real x III. $\int_0^1$ f(x)dx $\leq \int_0^1$ g(x)dx

A. I Only

B. III Only

C. I and II Only

D. all I, II and III

E. II Only

Question 75

$\text{lt}_{x\to 0} \frac{1-\cos 4x}{1+\cos 3x}$ =?

A. 0

B. 1

C. $\frac{-4}{3}$

D. $\frac{-3}{4}$

E. ∞

Question 76

Find the area of the region bounded by $y = e^x, y = e^{-x}$ and the line $x = 2$?

A. $e^2 + e^{-2} - 2$

B. $e^2 + e^{-2} + 2$

C. $e + e^{-1} - 2$

D. $e^2 - e^{-2} + 2$

E. Other than the given options

Question 77

Let $y' = \frac{dy}{dx}$ and $y'' = \frac{d^2y}{dx^2}$. Then $y = ae^x + be^{-3x}$ is the solution of

A. $y'' + y = 0$

B. $y'' + xy = 0$

C. $y'' + 2y' - 3y = 0$

D. $y'' - 3y' + 2y = 0$

E. $y'' + 2xy' = 0$

Question 78

Find the number of critical points of the function $f(x) = \sin^2 x$ on the interval $[0, 2\pi]$?

A. 1

B. 2

C. 3

D. 4

E. None

Question 79

Find $\lim_{x \to c} \frac{\sqrt{x} - \sqrt{c}}{x - c}$ for $c > 0$

A. 0

B. $2\sqrt{c}$

C. c

D. $\frac{1}{2\sqrt{c}}$

E. 1

Question 80

The first derivative of a function is given by $f'(x) = \frac{x+1}{\sqrt{x^2+1}}$. Then the interval on which f is increasing is

A. $(-1, \infty)$

B. $(0, \infty)$

C. $(-1, 1)$

D. $(-\infty, 1)$

E. $(-\infty, -1)$

Question 81

Express 20 as the sum of 2 positive numbers x and y such that $x^3 + y^2$ is as small as possible. The numbers x and y respectively are:

A. 10,10

B. 1,19

C. $\frac{5}{2}, \frac{35}{2}$

D. $\frac{10}{3}, \frac{50}{3}$

E. Other than the given options

Question 82

A function $f(x)$ has the following properties: $f''(x) = 6x - 12$ and the graph of the curve $y = f(x)$ passes through the point $(2, 5)$ and has a horizontal tangent at that point. Then $f(x)$ =?

A. $x^3 - 6x^2 + 12x - 3$

B. $-x^3 + 6x^2 - 12x - 3$

C. $6x^3 - 12x^2 + 6x - 1$

D. $x^3 - 6x^2 - 12x - 3$

E. Other than the given options

Question 83

If $\int_1^3 \frac{dx}{x^{1/2}+x^{3/2}} = \frac{\pi}{b}$, then the value of b = ?

A. 1

B. 12

C. 3

D. 4

E. 6

Question 84

The sum of the series $\sum_{k=1}^{\infty} \frac{k(k+1)}{k!}3^k$ = ?

A. e

B. e^3

C. $3e^3$

D. $9e^3$

E. $15e^3$

Question 85

If $y = \cos^{-1}\left(\frac{1-x}{2\sqrt{x}}\right)$. Then $\frac{dy}{dx}$ = ?

A. $\frac{x}{1+\sqrt{x}}$

B. $\frac{1}{\sqrt{x(1+x)}}$

C. $\frac{1}{\sqrt{x(1-x)}}$

D. $\frac{1}{(1+x)\sqrt{x}}$

E. $\frac{x}{1-\sqrt{x}}$

Question 86

If $xe^{xy} = y + \sin^2 x$, then what is the value of $\frac{dy}{dx}$ at $x = 0$?

A. π

B. 0

C. 1

D. -1

E. Other than the given option

Question 87

If each pair of the equation $x^2 + ax + b = 0, x^2 + bx + c = 0$ and $x^2 + cx + a = 0$ has one common root then the product of all common root is

A. $\sqrt{abc}$

B. $4\sqrt{abc}$

C. $2\sqrt{abc}$

D. $\sqrt{ab + bc + ca}$

E. Other than the given options

Question 88

Evaluate $\int_0^a \int_0^x (x^2 + y^2)\, dydx$

A. $\frac{a^2}{2}$

B. $\frac{a^3}{2}$

C. $\frac{a^4}{4}$

D. $\frac{a^4}{3}$

E. None of the above

Question 89

Trapezoidal rule for evaluation of $\int_a^b ydx$ requires the interval $[a, b]$ to be divided into

A. 2n − 1 subintervals of equal width

B. 2n + 1 subintervals of equal width

C. Any number of subintervals of equal width

D. 2n subintervals of equal width

E. Other than given options

Question 90

If the percentage error in volume of a sphere is 5%, then find the percentage error in its radius?

A. 15

B. 10

C. 5

D. 1.33

E. 1.67

Question 91

If $\sin u = \frac{x^2+y^2}{x+y}$, then find $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y}$

A. $\cos u$

B. $\tan u$

C. 1

D. π

E. $\sin u$

Question 92

Find the derivative of $\tan^{-1}\left(\frac{3x-x^3}{1-3x^2}\right)$ with respect to $\tan^{-1}\left(\frac{2x}{1-x^2}\right)$

A. 3/2

B. 2/3

C. $3x$

D. $2x$

E. $\tan x$

Question 93

Find $\lim_{x\to 0} \frac{x+\tan x}{\sin x}$

A. 1

B. 2

C. 0.5

D. 0.25

E. 0

Question 94

Find the distance between the foci of the hyperbola given that $x = 4\sec\theta$ and $y = 4\tan\theta$.

A. $\sqrt{2}$

B. $2\sqrt{2}$

C. $4\sqrt{2}$

D. $8\sqrt{2}$

E. Other than the given options

Question 95

A ball is dropped from a height of 15 feet. Each time it bounces, it rises four-fifths the vertical distance it previously fell. The total distance travelled by the balls is feet.

A. 90

B. 135

C. 120

D. 105

E. 75

Question 96

Let T be the linear operator on $\mathbb{R}^2$ defined by $T(x_1, x_2) = (x_1, 0)$. Then with respect to the basis $\{e_1, e_2\}$ of $\mathbb{R}^2$ where $e_1 = (1, 0)$ and $e_2 = (0, 1)$, T is of form

A. $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$

B. $\begin{bmatrix} 1 & 0 \\ 0 & 0 \end{bmatrix}$

C. $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

D. $\begin{bmatrix} 0 & 0 \\ 1 & 0 \end{bmatrix}$

E. $\begin{bmatrix} 0 & 1 \\ 0 & 0 \end{bmatrix}$

Question 97

Let $\{a_n\}$ and $\{b_n\}$ be two real sequences such that $a_n > 0, b_n > 0$ for all n. Suppose $\lim_{n\to\infty} a_n = a$ and $\lim_{n\to\infty} b_n = b$. Let $c_n = \frac{a_n}{b_n}$. Then

A. $\{c_n\}$ does not converge to a limit

B. $\{c_n\}$ converges only if $a > 0$

C. $\{c_n\}$ converges only if $b > 0$

D. $\{c_n\}$ converges only if $b = 0$

E. $\{c_n\}$ converges only if $a = 0$

Question 98

Which one of the following vectors does not form a basis for $\mathbb{R}^3$?

A. $a_1 = [3, 0, 2], a_2 = [7, 0, 9], a_3 = [4, 1, 2]$

B. $a_1 = [1, 1, 0], a_2 = [3, 0, 1], a_3 = [5, 2, 1]$

C. $a_1 = [1, 0, 4], a_2 = [2, 0, 8], a_3 = [7, 1, 8]$

D. $a_1 = [1, 5, 7], a_2 = [4, 0, 6], a_3 = [1, 0, 0]$

E. None of the above

Question 99

If $y = a\cos(\log x) + b\sin(\log x)$ then

A. $x^2\frac{d^2y}{dx^2} + x\frac{dy}{dx} - y = 0$

B. $x^2\frac{d^2y}{dx^2} - x\frac{dy}{dx} + y = 0$

C. $x^2\frac{d^2y}{dx^2} + x\frac{dy}{dx} + y = 0$

D. $\frac{d^2y}{dx^2} + x\frac{dy}{dx} - y = 0$

E. $\frac{d^2y}{dx^2} - x\frac{dy}{dx} + y = 0$

Question 100

Which of the following statements is true?

A. Every continuous function is integrable

B. A function f, defined on $[-1, 1]$ such as $f(x) = k, k > 0$ when $x \neq 0$ and zero otherwise is continuous but not integrable

C. Every integrable function is continuous

D. A function is integrable if and only if it is continuous

E. A continuous function is differentiable everywhere

ASHOKA MOCK 1

Question 1

Suppose an urn has b blue balls and r red balls. We randomly pick a ball. If the drawn ball is red, we put two red balls back to the urn. If the drawn ball is blue, we put two blue balls back into the urn. Then we randomly pick a ball again. What is the probability that the second pick is red?

A. $\frac{r}{r+b}$
B. $\frac{b}{r+b}$
C. $\frac{2r}{2r+b}$
D. $\frac{2b}{2r+b}$

Question 2

John and Jenny are waiting for Amy at the movie theatre. John says, "If Amy has taken the metro, her probability of reaching on time is 0.7. However if she is driving or has taken a cab, her probability of reaching on time is 0.5 and 0.8, respectively." Jenny adds, "The probability of Amy taking the metro is 0.5, of driving is 0.3 and of traveling by cab is 0.2." Amy is not on time. What is the probability that she did not take a cab?

A. $\frac{3}{10}$
B. $\frac{17}{50}$
C. $\frac{15}{17}$
D. $\frac{3}{25}$

Question 3

A random sample of size 8 is drawn from a distribution with probability mass function

$$p(k;\theta) = \theta^k(1-\theta)^{(1-k)}, k = 0, 1; 0 < \theta < 1$$

The sample values are $1, 0, 1, 1, 0, 1, 1, 0$. The maximum likelihood estimate of θ is

A. 1
B. 5/8
C. 3/8
D. 0

Question 4

If there are no economists that aren't social scientists and no statisticians that aren't economists, then which of the following statements is always true?

A. All social scientists are statisticians
B. All statisticians are social scientists
C. Any social scientist is also an economist.
D. None of the above

Question 5

Economic policy today must be flexible enough to change constantly and to adapt to outside and internal conditions even as they . . . . . Such an approach requires the ..... to be open to mid-course correction. Further, it calls for a ..... to shut down initiatives if it becomes clear that they are doomed to fail. Choose the combination most appropriate for the blanks in the passage:

A. evolve, policy maker, willingness

B. deteriorate, firms, patience

C. improve, citizens, foresight

D. change, policy maker, patience

Question 6

A study by a multilateral bank found that a particular state recorded the highest rate of industrial growth among states in India for a whole decade. From this the authors concluded that this state may be considered a manufacturing powerhouse. Which of the following, if true, would most undermine this description?

A. During the same period the state also recorded the highest agricultural growth among Indian states.

B. Oil refining by a single firm accounted for 75 percent of industrial output.

C. The state has disappointing human development indicators.

D. Industrial output accounts for less than 50 percent of the state domestic product.

Question 7

The Grand Theater is a movie house in a medium-sized college town. If the theater is open, the owners have to pay a fixed nightly amount of $500 for films, ushers, and so on, regardless of how many people come to the movie. For simplicity, assume that if the theater is closed, its costs are zero. The nightly demand for Grand Theater movies by students is

$$Q_S = 220 - 40P_S$$

where Q_S is the number of movie tickets demanded by students at price P_S. The nightly demand for nonstudent moviegoers is

$$Q_N = 140 - 20P_N$$

The profit-maximizing number of tickets sold to the students and the non-students, respectively, are:

A. 110,70

B. 50,70

C. 200,110

D. 20,20

Question 8

A monopolist faces demand

$$P = 10 - Q$$

in the market. The monopolist has a constant unit cost equal to 5 for the first two units of output, then it decreases to 3 per unit. It's profit maximizing output equals:

A. $\frac{3}{2}$

B. $\frac{7}{2}$

C. 2

D. Both a and b

Question 9

A utility function $u : \mathbb{R}_+ \times \mathbb{R}_+ \to \mathbb{R}$ over two commodities, both of which can be consumed in only non-negative amounts, is said to satisfy the property of local non-satiation (LNS) if for any commodity bundle $(x, y) \in \mathbb{R}_+ \times \mathbb{R}_+$ and any open set O containing this bundle, it is possible to find another commodity bundle $(x', y') \in (\mathbb{R}_+ \times \mathbb{R}_+) \cap O$ such that (x', y') is strictly preferred to (x, y), i.e., $u(x', y') > u(x, y)$. (Note that $\mathbb{R}_+$ denotes the set of non-negative real numbers) Consider the following two utility functions:

$$\tilde{u}(x, y) = x^{0.5} y^{0.5}$$
$$\hat{u}(x, y) = -(x + y)$$

Which of the following statements is true?

A. Both $\tilde{u}$ and $\hat{u}$ satisfy LNS

B. Neither $\tilde{u}$ nor $\hat{u}$ satisfy LNS

C. $\tilde{u}$ satisfies LNS but $\hat{u}$ does not

D. $\hat{u}$ satisfies LNS but $\tilde{u}$ does not

Question 10

Charu loves apples and hates bananas. Her utility function is

$$U(a; b) = a - \frac{1}{4} b^2$$

where a is the number of apples she consumes and b is the number of bananas she consumes. Sandeep likes both apples and bananas. His utility function is

$$U(a; b) = a + 2\sqrt{b}$$

Charu has an initial endowment of no apples and 8 bananas. Sandeep has an initial endowment of 16 apples and 8 bananas. If apples is the numeraire commodity (i.e., its price is normalized to 1), then the only price of bananas at which Sandeep will want to consume exactly 16 bananas is

A. 4

B. $\frac{1}{2}$

C. $\frac{1}{4}$

D. 1

Question 11

Consider an exchange economy with two agents, A and B, and two goods, x and y. Agent A's endowment is $(0, 1)$ and Agent B's endowment is $(2, 0)$. The agents can consume only non-negative amounts of the goods. Agent A lexicographically prefers x to y, i.e., she strictly prefers a bundle containing more x, and if the bundles contain equal amounts of x then only she strictly prefers the one with more of y. Agent B, on the other hand, treats x and y as perfect substitutes, i.e., she likes a bundle (x, y) strictly more than (x', y') only if $x + y > x' + y'$. The competitive allocation for this economy is:

A. A gets $(0, 1)$, B gets $(2, 0)$

B. A gets $(2, 0)$, B gets $(0, 1)$

C. A gets $\left(\frac{3}{2}, 0\right)$, B gets $\left(\frac{1}{2}, 1\right)$

D. A gets $(1, 0)$, B gets $(1, 1)$

Question 12

Indicate which of the following statements are true. (i) When the output gap is zero the economy is on its short-run Phillips Curve but converse is not true. (ii) The output gap is the ratio of actual to natural real GDP. (iii) A shift of the supply curve results in a negative output gap. (iv) When the output gap is zero inflation is steady. The options are:

A. Statements (i), (ii) and (iv)

B. Statements (iii) and (iv)

C. Statements (ii), (iii) and (iv)

D. Statements (ii) and (iv)

Question 13

The function $f : \mathbb{R} \to \mathbb{R}$ is defined by $f(x) = |3x| + 4$. For which of the following functions $g : \mathbb{R} \to \mathbb{R}$ does the graph of g intersect the graph of f? (Note that $\mathbb{R}$ denotes the set of real numbers. We use this notation at several places in subsequent questions as well.)

A. $g(x) = x - 2$

B. $g(x) = 2x - 2$

C. $g(x) = 3x + 3$

D. $g(x) = 4x - 2$.

Question 14

The function $f : \mathbb{R} \to \mathbb{R}$ is defined as $f(x) = \frac{(x^2-4)(x-1)}{x^2-a}$. For how many positive values of a is the function continuous at all values of x?

A. None

B. One

C. Four.

D. Two.

Question 15

The function $f : \mathbb{R}_+ \to \mathbb{R}$ is differentiable, strictly concave, strictly increasing and satisfies $f(0) = 0$. Which of the following statements is true about this function? (Note that $\mathbb{R}_+$ denotes the set of non-negative real numbers and f' denotes the first derivative of f)

A. $f'(x) < \frac{f(x)}{x}$, for all $x > 0$

B. $f'(x) > \frac{f(x)}{x}$, for all $x > 0$

C. $f'(x) = \frac{f(x)}{x}$, for some $x > 0$

D. None of the above

Question 16

What is the solution to the following optimization problem?

$$\max_{x \geq 0, y \geq 0} \{\alpha y - \beta x\}, \text{ where } \alpha, \beta > 0$$

subject to

$$x + y = 1$$

A. $x = 1, y = 0$

B. $x = 0, y = 1$

C. $x = -1, y = 2$

D. None of the above

Question 17

What is the solution to the following optimization problem?

$$\min_{(x,y) \in \mathbb{R} \times \mathbb{R}} \{x + y\}$$

subject to

$$x^2 + y^2 \leq 1$$

A. $x = 0, y = 0$

B. $x = -\frac{1}{2}, y = -\frac{1}{2}$

C. $x = -\frac{1}{\sqrt{2}}, y = -\frac{1}{\sqrt{2}}$

D. None of the above

Question 18

What is the solution to the following optimization problem?

$$\min_{(x,y) \in \mathbb{R} \times \mathbb{R}} \{y - 2x\}$$

subject to

$$y = ||x| - 1|$$

A. $x = 0, y = 0$

B. $x = 1, y = 0$

C. $x = 0, y = 1$

D. This problem does not have a solution

ASHOKA MOCK 2

Question 1

Let $X = \{x, y, z\}$. Let $\succsim \subseteq X \times X$, given by $\succsim = \{(x,x),(y,y),(z,z),(x,z),(z,x),(y,z),(z,y)\}$, denote the weak preference (binary) relation of a decision maker. Which of the following is true:

A. $\succsim$ is complete but not transitive

B. $\succsim$ is transitive but not complete

C. $\succsim$ is both complete and transitive

D. $\succsim$ is neither complete nor transitive

Question 2

Person A's utility function is given by

$$U(x_1, x_2) = x_1^2 + x_2^2$$
$$x_1, x_2 \geq 0$$

Price of both the goods are same. Then, what must be true about the optimal bundle?

A. Consumer consumes good 1 and good 2 in 1 -to- 1 ratio

B. Consumer consumes only good 1

C. Consumer consumes only good 2

D. Consumer is indifferent between consuming only good 1 and consuming only good 2 .

Question 3

Demand function for roses is given by:

$$Q_d = 100 - p$$

and supply is given by:

$$Q_s = 10 + 2p$$

The Government levies a sales tax on roses after which the volume of sales drops to 60. Then, per unit tax is:

A. 20

B. 15

C. 10

D. 5

Question 4

A consumer has utility function given by:

$$u(x_1, x_2) = \min\{2x_1 + x_2, x_1 + 2x_2\}$$

Given income $m = 100$, prices $p_1 = 20, p_2 = 30$, the amount of x_1 in her utility maximizing bundle is:

A. 7

B. 5

C. 2

D. 0

Question 5

Consider a firm using two inputs to produce an output. It is known that greater use of any of the inputs leads to greater output. Moreover, for any combination of input prices, the firm employs in input combination of the form (x, ax), where $a > 0$ is a constant. Which of the following functions represent the firm's technology?

A. $f(x, y) = \min\left\{x^a, y\right\}$

B. $f(x, y) = \min\{ax, y\}$

C. $f(x, y) = \min\{x, ay\}$

D. $f(x, y) = \min\left\{x, y^a\right\}$

Question 6

A monopolist faces demand

$$P = 8 - Q$$

in the market. The monopolist has a constant unit cost equal to 5 for the first two units of output, then it decreases to 3 per unit. It's profit maximizing output equals:

A. $\frac{3}{2}$

B. $\frac{5}{2}$

C. 2

D. Both a and b

Question 7

Consider a world with two goods, x and y. Smriti happens to lexicographically prefer x to y. Smriti's preferences can be represented by the utility function:

A. $u(x, y) = x$

B. $u(x, y) = x^{0.99}y^{0.01}$

C. $u(x, y) = \frac{x}{y}$

D. none of the above

Question 8

Consider a world with three individuals, A, B and C, and two goods, x and y.A lexicographically prefers x to y, whereas B and C 's preferences are represented by the utility functions $\min\{x, y\}$ and $\max\{x, y\}$, respectively. Which of the following statements is true:

A. A and B 's preferences are convex, but C 's is not

B. B and C 's preferences are convex, but A 's is not

C. C and A 's preferences are convex, but B 's is not

D. B's preferences are convex but A's and C's are not

Question 9

Consider statements A and B : A: Every general competitive equilibrium allocation is Pareto efficient B: Every Pareto efficient allocation can be supported as a general competitive equilibrium allocation Which of the following statements is true?

A. Both statements A and B are necessarily true

B. Statement A is necessarily true but not statement B

C. Statement B is necessarily true but not statement A

D. Neither statement A nor B is necessarily true

Question 10

Consider a pure exchange competitive market economy with two individuals, A and B, and two commodities, x and y, whose prices are denoted by p_X and p_Y, respectively. Individual A lexicographically prefers x to y. Individual B 's utility function is $\min\{x, y\}$. Both individual A 's and B's endowment is $(50, 50)$. A competitive equilibrium price ratio, p_X/p_Y, for this economy

A. exists and is equal to 1

B. exists and is less than 1

C. exists and is greater than 1

D. does not exist

Question 11

The Central Bank controls money supply in the economy by

A. printing currency notes and coins

B. setting bank loan rates

C. altering required reserve ratio

D. lending to government and large size firms

Question 12

Which of the following is true?

A. a rise in foreign income, other things being equal, worsens home country's trade balance

B. a real depreciation by the home country improves the trade balance and hence decreases aggregate demand

C. a rise in home income raises import spending and hence improves trade balance

D. none of the above

Question 13

Life cycle permanent income hypothesis predicts

A. marginal propensity to consume out of transitory income is higher than marginal propensity to consume out of permanent income

B. propensity to consume out of wealth is independent of age

C. consumption is smoother than income over one's lifetime

D. marginal propensity to consume is constant over one's lifetime

Question 14

Which of the following is true?

A. unemployment is directly related to real GDP

B. jobless recovery is a phenomenon where output increases and unemployment rates decrease in an economy

C. frictional unemployment exists when the economy is less than its full employment levels

D. natural unemployment can be reduced by reducing unemployment benefits

Question 15

Which of the following relations is not true?

A. GDP - Depreciation = NDP

B. GDP less Net Factor Payments Abroad = GNP

C. Disposable income = Income + Transfers - Taxes

D. GDP = Gross Value Added = Profits - Wages

Question 16

The government wishes to raise equilibrium income by Rs. 1000 crores via in an economy in which the marginal propensity to consume is .75. Its chosen instrument is a tax cut. By how much should taxes be reduced?

A. Rs. 75 crores

B. Rs. 25 crores

C. Rs. 333.33 crores

D. The tax cut cannot guarantee an increase in income at all.

Question 17

In the IS-LM model if investment demand does not vary with the interest rate:

A. both monetary and fiscal policy are ineffective

B. both monetary and fiscal policy are effective

C. monetary policy is effective, but fiscal policy is ineffective

D. monetary policy is ineffective, but fiscal policy is effective

Question 18

In the Solow model of growth a rise in the rate of depreciation:

A. raises the steady state level of output per capita.

B. lowers the steady state level of output per capita

C. has no impact on output per capita as savings will adjust

D. encourages technical progress as society must now replace capital faster

Question 19

The nominal exchange rate on January 1 was "10 Mexican pesos = 1 US dollar." We are informed that the dollar has since depreciated in real terms. What does this imply?

A. there is inflation in the US but not in Mexico

B. there is inflation in Mexico but not in the US

C. inflation in the US exceeds that in Mexico

D. inflation in Mexico exceeds that in the US

Question 20

Your neighbour has 2 children. You learn that he has a son, Joe. What is the probability that Joe's sibling is a brother?

A. 1/2

B. 1/3

C. 1

D. 2/3

Question 21

Two cards from an ordinary deck of 52 cards are missing. What is the probability that a random card drawn from this deck is a spade?

A. 1/4

B. 1/2

C. 1/5

D. 1/13

Question 22

Suppose you and a friend play a game. Two standard, fair, six-sided dice are thrown, and the numbers appearing on the dice are multiplied together. If this product is even, your friend gives you a quarter, but if this product is odd, you must give your friend one dollar. What is the expected value of this game for you?

A. 6.25 cents

B. −6.25 cents

C. −75 cents

D. 75 cents

Question 23

Consider a positively skewed distribution. Find the correct answer on the position of the mean and the median:

A. Mean is greater than median

B. Mean is smaller than median

C. Mean and median are same

D. None of the above

Question 24

Let A and B be two mutually exclusive events with positive probability each, defined on the same sample space. Find the correct answer:

A. A and B are necessarily independent

B. A and B are necessarily dependent

C. A and B are necessarily equally likely

D. None of the above

Question 25

Let p be the probability that a coin toss turns out to be 'Heads' and let $\hat{p}$ be an estimate of this probability. A coin is tossed 20 times. The coin turns out to be 'Heads' 7 times and 'Tails' 14 times. Which of the following would you conclude?

A. $p = 0.3$

B. $p = 0.5$

C. The expected value of $\hat{p}$ is p

D. None of the above

Question 26

A soft-drink vending machine is set so that the amount of drink dispersed is a random variable with a mean of 200 milliliters and a standard deviation of 15 millilitres. 36 samples are taken randomly from the vending machine. The mean amount dispersed in the sample is 196 milliliters. What is the variance of the mean?

A. 225

B. 22.5

C. 2.5

D. Cannot be determined without more information

Question 27

In 16 ten-kilometre runs, the petrol consumption of a car averaged 1 litres with a standard deviation of 0.4 litres. The t-ratio for testing the claim that the average petrol consumption (for 10 km run) of this car is 1.2 litres is

A. 4

B. -2

C. 0.4

D. -0.4

Question 28

If $\hat{\theta}$ is an unbiased estimator of θ, then which of the following is true:

A. $a\hat{\theta} + b$ is an unbiased estimator of $a\theta + b$ for all possible values of a and b.

B. $a\hat{\theta} + b$ is an unbiased estimator of $a\theta + b$ only when both a and b are strictly positive

C. $a\hat{\theta} + b$ is an unbiased estimator of $a\theta + b$ only when a is strictly positive and $b = 0$

D. $a\hat{\theta} + b$ is an unbiased estimator of $a\theta + b$ only when a is strictly positive and for all possible values of b

Question 29

If a random sample of size $n = 20$ from a normal population with the variance $\sigma^2 = 225$ has the mean 64.3, the 95% confidence interval for population mean is

A. $(44.3, 84.3)$

B. $(57.7, 70.9)$

C. $(49.3, 79.3)$

D. None of the above

Question 30

Which of the following equations has the largest number of real solutions?

A. $x^2 + x + 12 = 17 - 2x$

B. $6x + 8 = 4 - 12x$

C. $x^4 + x^2 + 8 = 0$

D. $e^x + \frac{9}{e^x} = 6$

Question 31

If $f(x) = \begin{cases} 5x^2 & x \leq 2 \\ -3x^3 & x > 2 \end{cases}$, which of the following statements is true?

A. f is continuous and differentiable everywhere

B. f is continuous and differentiable for $x > 2$

C. f is continuous everywhere but not differentiable at $x = 2$

D. None of the above

Question 32

Let f be a function defined by $f(x) = e^{2x+1}$. Then $\lim_{x \to 0} \frac{f(f(x)) - f(e)}{x} =$

A. e^{2e+1}

B. $2e^{2e+2}$

C. $4e^{2e+2}$

D. $8e^{2e+1}$

Question 33

How many stationary points does the following function have: $f(x,y) = x^2 + 2x + y^2e^x$

A. 0

B. 1

C. 2

D. 3

Question 34

The matrix A is always invertible for the following values of a and b. $A = \begin{pmatrix} a & 0 & b \\ ab & b & a \\ a & a & b \end{pmatrix}$

A. $a = 0; b = 1$

B. $a \neq b$

C. $a = 1; b = 0$

D. None of the above

Question 35

If $L = \lim_{x\to\infty} \left[\left(x^5 - x^4\right)^3 - x \right]$, then L equals

A. 1/5

B. 1/4

C. 0

D. None of the above

Question 36

If $y = e^{-x-5}$, then $\frac{dx}{dy}$ equals

A. $-y$

B. $-1/y$

C. $-1/y^2$.

D. 1/5

Question 37

If the function $f(x,y) = x^2 + y^2$ is maximised subject to $g(x,y) = x^2 + xy + y^2 = 3$, then the following is a solution

A. $(1,1)$

B. $(-1,-1)$

C. $(2,-2)$

D. $(3,-\sqrt{3})$

E. $(\sqrt{3},-\sqrt{3})$

Question 38

Let $f(x) = \frac{x^2}{x^2+2}$. Then, $-1/3\sqrt{6}$ is

A. A local minimum

B. A maximum

C. A global minimum

D. A point of inflection

Question 39

$e^x - 1$ is

A. greater than $x + x^2/2$ for $x > 0$

B. less than $x + x^2/2$ for $x > 0$

C. greater than $x + x^2/2$ only for $x > 2$

D. greater than $x + x^2/2$ only for $x > 1$

Question 40

If $z = e^{x^2} + y^2 e^{xy}, x = 2t + 3s, y = t^2 s^3$, then $\frac{\partial z}{\partial t}(t, s)$ at $t = 1, s = 0$ is

A. e^4

B. $16e^2$

C. $8e^4$

D. $8e^2$

Question 41

Although spinach is rich in calcium, it also contains large amounts of oxalic acid, a substance that greatly impedes calcium absorption by the body. Therefore, other calcium-containing foods must be eaten either instead of or in addition to spinach if a person is to be sure of getting enough calcium. Which of the following, if true, most seriously weakens the argument above?

A. Rice, which does not contain calcium, counteracts the effects of oxalic acid on calcium absorption.

B. Dairy products, which contain even more calcium than spinach does, are often eaten by people who eat spinach on a regular basis.

C. Neither the calcium nor the oxalic acid in spinach is destroyed when spinach is cooked.

D. Oxalic acid has little effect on the body's ability to absorb nutrients other than calcium.

Question 42

What is the negation of the following sentence: All Chinese citizens speak Mandarin.

A. No Chinese citizen speak Mandarin.

B. At least one Chinese citizen speaks Mandarin.

C. Some Chinese citizens do not speak in Mandarin.

D. None of the above.

Question 43

Which of the following statements are NOT equivalent to the statement: If an animal is a primate, then it is a mammal.

A. All primates are mammals. (b) There does not exist a primate that is not a mammal.

B. If an animal is not a mammal, then it is not a primate.

C. If an animal is not a primate, then it is not a mammal.

Question 44

Find the missing number in the following series from the options given below

$$6, 5, 24, 25, 144, -$$

A. 150

B. 155

C. 175

D. 180

Question 45

There are six persons A, B, C, D, E and F.C is the sister of F.B is the brother of E's husband. D is the father of A and grandfather of F. There are two fathers, three brothers and a mother in the group. Which of the following is a group of brothers ?

A. ABD

B. ABF

C. BFC

D. BDF

Question 46

There are three persons X, Y, Z. One of them is a truth-teller (always tells the truth), another is a Liar (always lies) and the third is a normal person (sometimes lies, sometimes tells the truth). They all know of each others? and their own types. X said : "I am a normal person." Y said: " X and Z sometimes tell the truth." Z said : "Y is a normal person." Which of the following is true?

A. These statements are insufficient to determine who is a liar

B. X is a normal person, Y is a truth-teller and Z is a liar.

C. These statements are insufficient to determine who is a liar, or a truth-teller, or a normal person.

D. X is a liar, Y a normal person, Z is truth-teller.

Question 47

The WOW language has only two letters in its alphabet, O and W. The language obeys the following rules: (i) deleting successive letters WO from any word which has more than two letters gives another word of the same meaning. (ii) inserting OW or WWOO

in any place in a word yields another word of the same meaning. O, OWOOW, WOO, OWW are 4 words in this language. Which of the following is false?

A. The words WOO and OWW necessarily have the same meaning

B. WOO and OWW may not have the same meaning

C. O and OWOOW must have the same meaning

D. (b) and (c) are true

Question 48

A group of medical professionals found that while 75 percent of Indian women surveyed in 1965 revealed creeping osteoporosis the figure for 2000 was 50 percent of the same population. The researchers concluded that the incidence of osteoporosis among Indians had declined between 1965 and 2000 . Which of the following, if true, would most undermine the researchers' conclusion?

A. The individuals surveyed came from a variety of income backgrounds.

B. The individuals surveyed were all whom the medical professionals actually knew personally.

C. The accuracy of the methods of measuring bone density has improved dramatically even in India.

D. Those surveyed in 2000 were younger on average than those surveyed in 1965 .

Question 49

Two young persons are discussing the preservation of the species. Meena: "Since attempting to preserve every species that is currently endangered is prohibitively expensive, the endangered species whose value to humanity is the greatest should be accorded the highest priority for preservation." Saif: "But such a policy would be unsound because it is impossible to predict the future value of a species, nor is it always possible to assess the present value of species whose contributions to humanity, though significant, are indirect." Which of the following is the main point of Saif's response to Meena?

A. Since the methods for deciding which species have the most value to humanity are imperfect, informed decisions cannot be made on the basis of the assessment of such value.

B. Although it would be desirable to preserve all endangered species, doing so is not economically feasible.

C. Even if the value to humanity of a given species is known, that value should not be a factor in any decision on whether to expend effort to preserve that species.

D. Species whose contributions to humanity are direct should have a higher priority for preservation efforts than species whose contributions to humanity are only indirect.

MSE MOCK

Question 1

A function whose derivative is a constant multiple of itself must be:

A. quadratic

B. linear

C. logarithmic

D. exponential

Question 2

Find the third order derivative of $Y = 5x^3$:

A. 30

B. $15X^2$

C. $30X$

D. $5X^2$

Question 3

$$A = \begin{bmatrix} 0 & 0 & 0 \\ 1 & 2 & 3 \\ 2 & 3 & 4 \end{bmatrix} \quad B = \begin{bmatrix} 1 & -2 \\ -1 & 0 \\ 2 & 1 \end{bmatrix} \quad \text{Find AB}$$

A. $\begin{bmatrix} 0 & 0 \\ 5 & 1 \\ 7 & 0 \end{bmatrix}$

B. $\begin{bmatrix} 1 & -2 \\ 3 & -5 \\ 4 & 9 \end{bmatrix}$

C. $\begin{bmatrix} 3 & -2 \\ 6 & -5 \\ 5 & -7 \end{bmatrix}$

D. $\begin{bmatrix} 2 & -2 \\ 5 & 3 \\ 7 & 4 \end{bmatrix}$

Question 4

$Lt_{x \to 3} \frac{x-3}{3-x}$ is:

A. -1

B. 0

C. 1

D. 3

Question 5

The function, $y = 3x^2 - 14x + 5$ at $x = 4$ is:

A. decreasing

B. increasing

C. stationary

D. none of the above

Question 6

Probability of sure event is

A. 1

B. 0

C. -1

D. None of the above

Question 7

A single letter is selected at random from the word PROBABILITY The probability that it is a vowel is

A. 3/11

B. 2/11

C. 4/11

D. 0

Question 8

If A and B are independent event, then P(A $\cap$ B)

A. $P(A)P(B)$

B. $P(A) + P(B)$

C. P(A \ B)

D. $P(B) - P(A)$

Question 9

Which expression gives the probability $P\left(\frac{1}{2} < X < 1\right)$ using $F(x)$, given $0 < x < 1$

A. $P\left(\frac{1}{2} < X < 1\right) = F\left(\frac{1}{2}\right) - F(1)$

B. $P\left(\frac{1}{2} < X < 1\right) = F(1) - F\left(\frac{1}{2}\right)$

C. $P\left(\frac{1}{2} < X < 1\right) = F(1) + F\left(\frac{1}{2}\right)$

D. $P\left(\frac{1}{2} < X < 1\right) = F(1) - F(0)$

Question 10

If a constant value 4 is subtracted from each observation of a set, the value of the variance is

A. reduced by 4

B. reduced by 16

C. reduced by 2

D. unaltered

Question 11

If among 200 students, 105 like pizza and 134 like burger, then the number of students who like only burger can possibly be

A. 26

B. 23

C. 96

D. 93

Question 12

If 10% of ' a ' is b% of 200, a/b = ?

A. 20

B. 1/20

C. 10

D. 1/10

Question 13

The population of a colony of ants increases by 20% every day. If one Monday the population is 3000 . On which day of the week is it 5184 ?

A. Wednesday

B. Tuesday

C. Thursday

D. Friday

Question 14

There are 13 numbers having an average of 9 . The largest and the smallest numbers are 26 and 8.5 respectively. Find the average of the remaining numbers

A. 7.5

B. 8

C. 8.5

D. 7

Question 15

The average weight of the students of two classes A and B with 20 and 30 students are 40 kg and 50 kg, respectively. Find the average weight of the students in both the classes put together?

A. 50Kg

B. 55Kg

C. 35Kg

D. 46Kg

Question 16

Which of the following polynomials leaves a reminder when divided by $x + 2$

A. $r(x) = (x + 2)^{12}$

B. $p(x) = x^2 - 4$

C. $s(x) = x^4 + 3x^2 + 1$

D. $q(x) = -x^3 + 8x^2 + 3x - 34$

Question 17

The characteristic roots of the matrix $A = \begin{pmatrix} 6 & 6 \\ 6 & -3 \end{pmatrix}$ are: :

A. Both positive

B. Both negative

C. One positive and one negative

D. None of the above

Question 18

At compound interest if a certain sum of money doubles in n years then the amount will be four fold in

A. $2n^2$ years

B. n^2 years

C. $4n$ years

D. $2n$ years

Question 19

If $f(x) = x^3 - x + 3$ and $g(x) = 3$, then $f(g(x)) - g(f(x))$ is equal to:

A. 24

B. 0

C. -24

D. 3

Question 20

Let $f(x) = 2x^6 - x^4$. If n is the number of stationary points and m is the number of inflection points, then:

A. $n + m = 6$

B. $n + m = 5$

C. $n + m = 2$

D. $n + m = 4$

Question 21

The function, $y = -2x_1^2 + 4x_1x_2 - 5x_2^2 + 2x_2x_3 - 3x_3^2 + 2x_1x_3$ is:

A. Positive definite

B. Negative semi-definite

C. Negative definite

D. Positive semi-definite

Question 22

If $f(x, y) = x^2 + y^2 - 4$. What are the level curves $f(x, y) = k$?

A. Hyperbolas for $k < -4$

B. Parabolas

C. Straight lines

D. Circles for $k > -4$

Question 23

The integral $\int \frac{dx}{x\sqrt{1-x^3}}$ is equal to

A. $\frac{1}{3}\log\left|\frac{\sqrt{1-x^2}+1}{\sqrt{1-x^2}-1}\right| + C$

B. $\frac{1}{3}\log\left|\frac{\sqrt{1-x^3}-1}{\sqrt{1-x^3}+1}\right| + C$

C. $\frac{2}{3}\log\left|\frac{1}{\sqrt{1-x^3}}\right| + C$

D. $\frac{1}{3}\log\left|1 - x^3\right| + C$

Question 24

Suppose that X is a random variable for which the MGF is as follows: $\psi(t) = e^{b^2t^2/2+at}$ for $-\infty < t < \infty$. Find the mean and the variance of X.

A. a and b^2

B. a and b

C. $2a$ and b

D. a^2 and b

Question 25

If 2 balls are drawn one after another from a bag containing 3 whites and 5 black balls, what is the probability that (i) The first ball is white and 2^{nd} is black? (ii) One ball is white and the other is black?

A. 15/56; 30/56

B. 8/56; 15/56

C. 15/56; 15/56

D. none of these

Question 26

Let X be a continuous random variable with PDF: $f(x) = ax, 0 \leq x \leq 1$ $= a, 1 \leq x \leq 2$ $= -ax + 3a, 2 \leq x \leq 3$ $= 0, 0.w$ (a) Find

a. (b) Compute $P(X \leq 1.5)$

A. $1/2; 1/2$

B. $1; 1/2$

C. $1/2, 1/3$

D. none of these

Question 27

X is a continuous random variable with pdf f(x) = 6x(1 − x), 0 ≤ x ≤ 1 Find b such that $P(X) < b = P(X) > b$

A. $1/2$

B. 1.2

C. $2/3$

D. 1

Question 28

Which of the following statements about hypothesis testing is true?

A. If the p-value is greater than the significance level, we fail to reject Ho

B. A Type II error is rejecting the null when it is actually true.

C. If the alternative hypothesis is that the population mean is greater than a specified value, then the test is a two-tailed test.

D. The significance level equals one minus the probability of a Type 1 error.

Question 29

A multiple-choice test has 30 questions. There are 4 choices for each question. A student who has not studied for the test decides to answer all the questions randomly by guessing the answer to each question. Which of the following probability distributions can be used to calculate the student's chance of getting at least 20 questions right?

A. Bionomial distribution

B. Poisson distribution

C. Exponential distribution

D. Uniform distribution

Question 30

The mean and standard deviation of a normal distribution are 66 and 6 respectively. The approximate range within which the middle 50% of the values would lie is

A. $(62, 70)$

B. $(60, 72)$

C. $(63, 69)$

D. $(64, 68)$

Question 31

Let the Cost function be $C = 100q^2$, where q is the output. Then the Average cost curve is:

A. U-shaped

B. Horizontal to the output axis

C. Downward sloping

D. Rising

Question 32

The Utility function of the consumer is $U = (xy)^{0.5}$, the prices of x and y are 2 and 2 respectively. The income of the consumer is 30 . What is the optimal bundle?

A. $(10, 0)$

B. $(0, 15)$

C. $(0, 20)$

D. $(7.5, 7.5)$

Question 33

What happens to the equilibrium output in the market if the unit cost of production increases? Assume that there is only one firm in the market.

A. Decrease

B. Decrease and it may be zero also

C. Constant

D. Increase

Question 34

Cross price elasticity of demand is:

A. negative for complementary goods

B. unitary for inferior goods

C. negative for substitute goods

D. positive for inferior goods

Question 35

Determine the Pure strategy Nash-Equilibrium from the following game:

		Player B	
		U	V
Player A	X	1,2	5,0
	Y	3,4	6,8

A. X, U

B. X, V

C. Y, U

D. Y, V

Question 36

The classical Quantity Theory of Money assumes that:

A. income is constant

B. velocity is constant

C. prices are constant

D. the money supply is constant

Question 37

Stagflation occurs when prices

A. fall; falls

B. fall; increases

C. rise; falls

D. rise; increases

Question 38

Under a fixed exchange rate regime

A. monetary policy is effective

B. monetary policy is ineffective

C. both monetary and fiscal policy are effective

D. both are ineffective

Question 39

If nominal wages are rigid in the short run the aggregate supply curve would be

A. vertical

B. upward-sloping

C. flat

D. downward-sloping

Question 40

In macroeconomics, the negative relationship between inflation and unemployment is summarized by:

A. The Phillips curve

B. The Engle curve

C. The indifference curve

D. Okun's law

Question 41

India is the biggest producer as well as the largest consumer and importer of which of the following crops?

A. Wheat
B. Cotton
C. Sugarcane
D. Pulses

Question 42

What is crude Literacy rate?

A. Number of illiterate persons to total populations
B. Number of graduate peoples to total population
C. Number of literate persons to total population
D. None of these

Question 43

The largest component of revenue expenditure in India is:

A. Pension
B. Interest payments
C. Education
D. Health

Question 44

The official estimate for poverty rate for India has been estimated using

A. Monthly per capita household consumption data
B. Monthly per capita household income data
C. Annual per capita national income data
D. All the above

Question 45

According to census definition Main workers are those who had work for -

A. 150 days or more
B. six months or more
C. eight months or more
D. not less than 300 days

AZIM PREMJI MOCK

Question 1

Consider the following utility functions over two goods x and y $u1(x,y) = ax + by$ $u2(x,y) = x^a y^b$ $u3(x,y) = a\ln(x) + b\ln(y)$ Which of the three utility functions have the same marginal rates of substitution for any given values of x and y

A. $u1(x,y)$ and $u2(x,y)$

B. $u2(x,y)$ and $u3(x,y)$

C. $u1(x,y)$ and $u3(x,y)$

D. None of the above

Question 2

A social planner has a Utilitarian social welfare function. The planner assumes that all individuals in the society have identical utility functions with diminishing marginal utility of money i.e. the utility function is concave with respect to money. This implies that any transfer of money from the rich to the poor will

A. Increase social welfare

B. Decrease social welfare

C. Leave social welfare unchanged

D. Not enough information to determine the change in social welfare

Question 3

Suppose a person choosing between fish (x) and money (y) has the following utility function: $u(x,y) = y + 10x - x^2$ Let the price of fish be 2 and the price of money be 1 . If the person has a budget of 30 , find the amount of fish the person can buy to maximise their utility.

A. 8

B. 5

C. 4

D. 2

Question 4

A tax increase will not cause any deadweight loss if

A. The supply is inelastic

B. The demand is inelastic

C. The tax is lumpsum

D. All of the above

Question 5

	H	M	L
h	2,2	3,3	4,4
m	3,5	5,1	2,4
I	4,2	2,2	5,3

The table above shows the payoff matrix between player 1 who chooses between strategies h, m and I, and player 2 who chooses between strategies H, M and L. The first number in each cell denotes the payoff for player 1 and the second number denotes the payoff for player 2. We consider only pure strategies. Select the correct statement:

A. The Nash equilibrium is (I, L) and it is Pareto efficient

B. The Nash equilibrium is (I, L) and it is not Pareto efficient

C. The Nash equilibrium is (h, L) and it is Pareto efficient

D. The Nash equilibrium is (h, L) and it is not Pareto efficient

Question 6

A person was offered a choice between (i) A lottery of Rs 100 with 50% probability and Rs 20 with 50% probability, (ii) A sure amount of Rs 50 If the person chooses (ii), then according to the expected utility theory, the person is

A. Risk averse

B. Risk neutral

C. Risk loving

D. The person's risk preference cannot be inferred from the given information

Question 7

Consider an indifference curve of a utility function of a consumer over two goods. Which of the following statement is true about the curve?

A. Utility increases as you move along the indifference curve from left to right

B. The point of intersection of two indifference curve is the optimal point of consumption

C. The slope of the indifference curve is equal to the marginal rate of substitution between the two goods

D. All of the above

Question 8

Which of the following production functions has constant returns to scale?

A. $f(l, k) = 10.3k^{0.7}$

B. $f2(I, k) = l + 2k$

C. $f3(I, k) = \min\{3\,|, k\}$

D. All of the above

Question 9

Assume that the price-elasticity of demand for adult footwear is relatively high, while the price-elasticity of demand for children's footwear is low. The elasticity of supply for both is the same. Now if GST on both adult's footwear and children's footwear is increased by five percentage points, what would happen to their prices?

A. Both their prices would increase by the same
B. The price of adult footwear would see a higher proportional increase
C. The price of children's footwear would see a higher proportional increase
D. Prices would remain unchanged

Question 10

Traffic is a big problem in Bangalore. A Pigouvian solution to the problem would be

A. A government law restricting the number of vehicle (like Delhi's odd-even rule)
B. A congestion charge to be paid by every vehicle in the city
C. Increase in the width of roads to accommodate more cars
D. All of the above

Question 11

Suppose a 4-sector economy with $C = 10 + .8(Y - T)$, $I = 10$, $G = 50$, $X = 40$, $T = 50$ and $M = 10 + .3Y$ Where C, I, G, X, T and M refer to consumption, investment, government expenditure, exports, taxes and imports respectively. What is equilibrium income in this economy?

A. 170
B. 120
C. 200
D. 220

Question 12

Monetary policy will have the largest effect on income when

A. The IS curve is steep and the LM curve is steep
B. The IS curve is flat and the LM curve is steep
C. The IS curve is flat and the LM curve is flat
D. The IS curve is steep and the LM curve is flat

Question 13

From the Quantity Theory of Money if M increases by 5 percent and V increases by 2 percent, then

A. Real income increases by approximately 7 percent
B. The price level increases by approximately 5 percent
C. Nominal income increases by approximately 5 percent

D. Nominal income increases by approximately 7 percent

Question 14

You observe that the government is increasing infrastructural spending. This could be a response to:

A. Higher unemployment

B. Slow Economic Growth

C. A recognized period of recession

D. All of the above

Question 15

According to the Solow model, persistently rising output and living standards can only be explained by:

A. Capital accumulation

B. High savings rates

C. Population growth

D. Technological progress

Question 16

What is the value of the multiplier in a closed economy with a Marginal Propensity to Save of 0.25?

A. 4

B. 1.33

C. 5

D. 1

Question 17

The value today associated with receiving Rs. 100 two years from today when the annual interest rate is 5% is

A. Rs. 100

B. Rs. 90.7

C. Rs. 90

D. Rs 95.2

Question 18

If the government increases its spending which of the following could occur?

A. Unemployment decreases

B. Inflation increases

C. The fiscal deficit rises

D. All of the above

Question 19

Which of the following are possible consequences of a fiscal expansion?

A. An increase in the trade deficit

B. Deflation

C. A reduction in national income

D. A rise in unemployment

Question 20

Which of the following is true?

A. Real GDP is always greater than Nominal GDP

B. Nominal GDP is always greater than Real GDP

C. Real GDP excludes some sectors counted in nominal GDP

D. Real GDP is lower than Nominal GDP if inflation is positive

Question 21

Consider two random variables x and Y. Looking at the scatter between x and Y, the researcher contemplates the following population regression: $Y = \beta_0 + \beta_1 x^2 + \beta_2 x^3 + \beta_2 e^x + \varepsilon$ Which of the following statements is true:

A. OLS cannot be applied as the equation is cubic in x

B. OLS cannot be applied as the equation contains e^x term

C. OLS cannot be applied as the equation is cubic in x and contains e^x term

D. OLS can be applied despite cubic in x and e^x term

Question 22

The degrees of freedom of the sample variance s^2, defined as $\frac{\sum(x_i - \bar{x})^2}{n}$ is

A. n

B. $n - 1$

C. $n - 2$

D. $\sqrt{n}$

Question 23

Consider a sample of n observations. The sample proportion of a binary categorical variable coded as 0/1 can be seen as,

A. The sample median of the sequence of 1 s and 0 s

B. The sample mode of the sequence of 1 s and 0 s

C. The sample mean of the sequence of 1 s and 0 s

D. None of the above

Question 24

Please refer to the figure below:

A. The mean and the median are the same value for all three plots

B. The mean is lower than median for the plot on the left (marked Negative Direction), while it is higher than median for plot on the right (marked Positive direction)

C. The mean is higher than median for the plot on the left (marked Negative Direction), while it is lower than median for plot on the right (marked Positive direction)

D. The mean and median cannot be the same value for all three plots shown above

Question 25

In set theory, if A and B are independent events, it follows

A. A and B' (B complement) are independent

B. $P(A \cap B) = P(A) + P(B)$

C. $P(A \cap B) = P(A/B)$

D. All of the above

Question 26

An oil exploration company currently has two active projects, one in Asia and the other in Europe such that the success of each project is independent of the other project. The probability that the Asian project is successful is 0.4, and the probability that the European project is successful is 0.7. Suppose you are told that the Asian project is not successful. Then, the probability that the European project is also not successful is,

A. 0.7

B. 0.28

C. 0.3

D. Indeterminate (cannot be spec

Question 27

In the context of hypothesis testing consider the following three statements: i. Even if the sample weakly contradicts the null hypothesis, the null hypothesis will be rejected. ii. Only if the sample strongly contradicts the null hypothesis, the null hypothesis will be rejected iii. The researcher approaches a test, assuming the null hypothesis to be true. Which of the following is true

A. Only i. is correct

B. Only ii. is correct

C. Both i. and iii. are correct

D. Both ii. and iii. are correct

Question 28

Consider the following regression equation: $Y = \beta_0 + \beta_1 x^2 + \beta_2(x * z) + \varepsilon$ Which of the following statements is true assuming this is the correct population equation:

A. The partial effect z is given by $2\beta_1 x + \beta_2 x$

B. The partial effect z is given by $2\beta_1 x + \beta_2$

C. The partial effect z is given by $\beta_2 x$

D. The partial effect z is given by β_2

Question 29

If random variable X follows Poisson Distribution and random variable Y follows Binomial Distribution, then

A. X must be discrete and Y must be continuous

B. X must be continuous and Y must be discrete

C. X and Y must both be discrete

D. X and Y must both be continuous

Question 30

A family has moved into a new neighborhood. The neighborhood has two medical clinics. Each medical clinic has two obstetricians and three pediatricians. The family requires the services of both types of doctors but is constrained to choose both doctors from the same clinic. In how many ways can this been done?

A. 10

B. 8

C. 36

D. 12

Question 31

The poverty head count ratio measures

A. The depth of poverty below the poverty line

B. The percentage of people living below the poverty line

C. The number of people living below the poverty line

D. The amount of inequality between the rich and the poor

Question 32

The term "jobless growth" refers to

A. A rise in proportion of women out of the labour force

B. A strong rise in unemployment accompanied by strong GDP growth

C. A strong rise in the youth unemployment rate despite high GDP growth

D. A weak rise in employment despite high GDP growth

Question 33

Until recently, the Indian economy followed the five year plan model of planning, which means that the government makes plans which are adhered to for five years. However, Indira Gandhi suspended five year plans and followed annual budgets from 1966 – 69. Why did she do this?

A. Congress did not have a majority government in the Lok Sabha

B. Food shortages and a sharp spike in inflation caused by monsoon failures

C. Threat of Maoist and Naxalite movements

D. War between India and Pakistan

Question 34

In India

A. The smallest proportion of workers are in the agricultural sector, but this sector has the highest contribution to GDP

B. The highest proportion of workers are in the agricultural sector, but this sector has the lowest contribution to GDP

C. The highest proportion of workers are in the agricultural sector and this sector has the highest contribution to GDP

D. The smallest proportion of workers are in the agricultural sector and this sector has the lowest contribution to GDP

Question 35

What is the aim of Ayushman Bharat Yojna - National Health Protection scheme

A. Health care insurance coverage for scheduled caste, scheduled tribe and low income households

B. Free health care of all Indian citizens

C. Subsidization of hospital charges for low income households

D. Free checkup in public hospitals

Question 36

In 2005 the Government of India introduced a programme that guaranteed 100 days of employment per year per household in rural areas. What is the name of this programme?

A. Sampoorn Grameen Rozgar Yojana (SGRY)

B. National Rural Employment Guarantee Act (NREGA) which was later re-named the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)

C. National Rural Livelihoods Mission (NRLM)

D. Skill India Mission

Question 37

After liberal reforms were introduced in 1991 , the government decided to dis-invest public sector enterprises (PSE). What does dis-investment mean in this context?

A. Allowing private companies to invest in sectors which were only controlled by PSE's like telecommunication

B. The selling of government equity in public sector undertakings

C. Selling off assets of PSE to private companies

D. Shutting down Public Sector Enterprises

Question 38

This graph on wages and productivity for India shows

A. productivity gains have NOT been associated with proportionate rises in real wages

B. productivity gains have been associated with proportionate rises in real wages

C. productivity gains have been associated with rising formalization of work

D. productivity gains have been associated with the rise of women in the work force

Question 39

Work in India is characterized by

A. the majority of workers in the organized sector

B. the majority of workers in the unorganized sector

C. the majority of workers out of the labour force

D. the majority of women entering the paid labour force

Question 40

The Gender Wage Gap refers to...

A. Average difference in wages (or remuneration) of women compared to men who are working

B. Average difference in time spent working of women compared to men

C. Standard deviation of wages for women compared to men

D. Difference between the highest paid women workers and the highest paid male workers

SAU MOCK

Question 1

Which of the following countries has the highest per-capita income (in PPP dollars) within the SAARC?

A. Nepal

B. Bhutan

C. Afghanistan

D. Maldives

Question 2

In the two-gap analysis of foreign aid, a country with a binding savings gap which of the following strategies does it need to bolster economic growth?

A. Attract foreign aid

B. Decrease imports

C. Increase productive resources

D. None of the above

Question 3

Although micro-credit is often targeted at the poor, the rate of interest charged in such loans is usually much higher than that charged by commercial banks. This is primarily because :

A. The micro-credit business is more profit-oriented than the commercial banks.

B. The transaction cost per unit of loan is higher for micro-credit loans.

C. In the absence of a collateral, micro-credit loans are more risky than bank loans.

D. Both (b) and (c).

Question 4

The Lewis model is considered to be a "classical" model of development because:

A. The productivity of labour in the modern sector is higher than that in the traditional sector.

B. The supply of labour in the economy is determined by a labour-leisure choice.

C. There is unlimited supply of labour available for the modern sector at a given wage rate.

D. All of the above.

Question 5

If a country grows at 6 per cent annually for a period of three years, the head-count rate of poverty

A. will fall by 18 per cent

B. will fall by 6 per cent

C. may rise, fall or remain the same

D. will fall by more than 18 per cent

Question 6

The Human Development Index constructed by the UNDP is based on the

A. Basic needs approach

B. Chronic poverty approach

C. Capability approach

D. Dependency theory

Answer questions 7 and 8 based on the following passage: Markets are superb coordination mechanisms in harmonizing numerous noncooperative interactions and in disciplining inefficiency and rewarding high value performance. But when incentives and control rights are misaligned (on account, say, of initial asset ownership differences constraining contractual opportunities), and there are important strategic complementarities in long-term investment decisions, markets fail to coordinate efficiently. The implications of 'imperfections' in, and sometimes the non-existence of, credit and insurance markets are severe for the poor, sharply reducing a society's potential for productive investment, innovation, and human resource development. The state can provide leadership for (and put selective incentives and pressure on) individuals interacting cooperatively in situations where non-cooperative interactions are inefficient. But the state officials may have neither the information nor the motivation to carry out this role; they may be inept or corrupt, and the political accountability mechanisms are often much too weak to discipline them. In the context of these pervasive market and government failures it is often pointed out that a local community organization, if it has stable membership and well-developed mechanisms of transmitting private information and enforcing social norms among its members, has the potential to provide sometimes more efficient coordination than either the state or the market. But community organizations 'fail' too when they are 'captured' by elite (or sectarian) interests, or are hamstrung by the secession of the rich and the talented from local communities, and they may face covariate risks and costs of small scale. [from Institutional Economics of Development: Some General Reflections by Pranab Bardhan in in T. Besley and R. Jayaraman (eds.), Institutional Microeconomics of Development, MIT Press, 2010.]

Question 7

According to the author, which allocative mechanism is free from the risk of coordination failure?

A. Market

B. State

C. Community

D. None of the above

Question 8

Which of the following is not a source of government failure?

A. Inadequate information

B. Lack of private incentive for public action

C. Externalities

D. Weak accountability

Question 9

A consumer's utility function is given by U = 3x + y for two goods x and y. Per-unit price of x and y are Rupees 30 each. The total income of the consumer is Rupees 900 . The equilibrium consumption bundle (x, y) of the consumer will be:

A. (30, 0)

B. (0, 30)

C. (15, 15)

D. None of the above

Question 10

Mr. X's total wealth next year, including his factory, is estimated to be Rupees 6, 00, 000. There is a 20 per cent chance that an accident in the factory, valued at Rupees 3, 00, 000, will completely ruin it next year. Mr. X's expected wealth next year, if he does not purchase hazard insurance for his factory is likely to be:

A. Rupees 6, 00, 000

B. Rupees 5, 20, 000

C. Rupees 5,40,000

D. None of the above

Question 11

Consider a competitive industry where the market demand is given by P = 50 − Q. The marginal cost function is simply MC = Q. If the government imposes a tax of 10 rupees per unit of production of this good, the equilibrium market price will go up by:

A. zero rupees

B. 10 rupees

C. 20 rupees

D. 5 rupees

Question 12

Two kinds of consumers exist for a product Z in a market. One kind of consumer has an intense liking for the product, with an inverse demand curve of P = 20 − Q, where P is price of Z and Q is the quantity of Z. The other type of consumer has a less intense liking for the product and has an inverse demand P = 5 − (1/2)*Q. Suppose that there are only two consumers in the market, one of each type. The market demand curve for Z will be:

A. Q = p for all price levels p.

B. Q = 30 − 3P for all price levels $p > 5$ and Q = 20 − P for p ≤ 5

C. $Q = 15 - 3P$ for all price levels $p \leq 5$ and $Q = 20 - P$ for $p > 5$.

D. Q = 30 -3P for all price levels $p \leq 5$ and Q = 20 − P for p > 5

Question 13

Consider a Leontief production function Q = Min(K/2, L/3). Price of K is 3 and price of L is 2 . If the firm intends to produce 40 units, the cost minimizing K, L combination will be:

A. (30, 40)

B. (20, 30)

C. (80, 120)

D. (120, 80)

Question 14

The production function of a monopolist firm is given by $Q = 10\,L - 0.5\,L^2$, where L is labour input and Q is output. If the demand curve is $P(Q) = 50 - 0.5Q$, what is the marginal revenue product of labour curve?

A. $500 + 150\,L - 15\,L^2$

B. $500 - 150\,L + 15\,L^2 - 0.5\,L^3$

C. $50 - Q$

D. None of the above

Question 15

Consider an exchange economy with two consumers and two goods. Total stock of both commodities is equal. Suppose the two commodities are perfect substitutes for both consumers. Then the set of Pareto optimal points will be

A. the diagonal of the Edgeworth Box

B. the horizontal axis of the Edgeworth Box

C. the vertical axis of the Edgeworth Box

D. the entire Edgeworth Box

Question 16

Let the production function be given by $Q = AK^{\alpha}L^{\beta}$ where $\alpha + \beta = 1$. Consider Marginal products of K (MP_K) and L (MP_L). Which one of the following statements is true about MP_K and MP_L ?

A. MP_K and MP_L are equal

B. MP_K and MP_L are homogeneous of degree zero

C. MP_K and MP_L are independent of K and L

D. MP_K and MP_L are same as Average Products.

Question 17

Suppose a person lives for two periods. His current period income is Rs. 42,000 and he possesses an asset worth Rs. 18000 . His future income is expected to be Rs. 33000 and the real rate of interest at which he can borrow or save is 10 percent. His current and future maximum consumption will be

A. Rs. 90000 and Rs. 99000

B. Rs. 42,000 and Rs. 33000

C. Rs. 75,000 in both the periods

D. Rs. 60000 and Rs. 51000

Next TWO questions are based on the following information Consider an economy where the nominal wage rate is set by a process of wage bargaining between the workers and the producers before actual production takes place. As an outcome of this process of bargaining, in any period t, the nominal wage rate, W_t is a function of the expected price level, P_t^e, the rate of unemployment, u_t (representing the relative bargaining power of the workers vis-à-vis the employers) and the averegae productivity of the workers, A_t, i.e. $W_t = P_t^e F(u_t, A_t)\,; F_u < 0, F_A > 0$ Once the nominal wage is determined, the producers set the actual price level, P_t, as a constant mark-up μ over the nomial wage -rate: $P_t = (1+\mu)W_t$. The actual rate of inflation is defined as $\pi_t \equiv (P_t - P_{t-1})/P_{t-1}$ and the expected rate of inflation as $\pi_t^e \equiv \left(P_t^e - P_{t-1}\right)/P_{t-1}$

Question 18

Given the above wage and price setting equations, derive the relationship between the expected rate of inflation and the actual rate of inflation. Which of the following equations represents this relationship?

A. $\pi_t = \pi_t^e(1+\mu)F\left(\mu_t, A_t\right)$

B. $\pi_t = \left(1+\pi_t^e\right)(1+\mu)F\left(\mu_t, A_t\right) - 1$

C. $\pi_t = \left(1+\pi_t^e\right)\left[F\left(\mu_t, A_t\right) - \mu\right] - 1$

D. None of the above

Question 19

Suppose the average productivity of the workers remains constant at a level $\bar{A}$. Given the relationship in your answer to the previous question, the natural rate of unemployment is given by

A. $F\left(u_t, \bar{A}\right) = \mu$

B. $F\left(u_t, \bar{A}\right) = \frac{1}{1+\mu}$

C. $F\left(u_t, \bar{A}\right) = \frac{\mu}{1+\mu}$

D. None of the above

Question 20

Suppose the following bilateral spot exchange rates are being quoted for the Afghan A fghani (AFN), Bangladeshi Taka (BDT) and Maldivian Rufiya (MVR): BDT/MVR = 5.26 AFN/MVR = 4.54 AFN/BDT = 0.88 If you start with 100MVR, the most you could end up with (in MVR) in a single round of trilateral arbitrage would be

A. 93.33

B. 98.08

C. 101.96

D. 102.67

Next TWO questions are based on the following information Consider an economy where the aggregate output is produced by using two factors, K and L, using a production function $Y = K^{\alpha}L^{1-\alpha}$. At every point of time, both factors are fully employed. A constant proportion s of total output is saved and automatically invested at each point in time, leading to augmentation of capital stock. However, capital is also subject to depreciation at a rate δ. Labor force grows at a constant rate n.

Question 21

The steady-state level of per capita output is given by

A. $s\left(\frac{K}{L}\right)^{\alpha} - \frac{(n+\delta)K}{L}$

B. $\left(\frac{s}{n+\delta}\right)^{1/(1-\alpha}$

C. $\left(\frac{s}{n+\delta}\right)^{\alpha/(1-\infty}$

D. cannot be determined from the given info

Question 22

The optimal savings rate which will maximise the per capita consumption level at the steady-state is given by

A. α

B. $n + \delta$

C. $\alpha(n + \delta)$

D. $\left(\frac{s}{n+\delta}\right)^{1/(1-\infty}$

Question 23

The traditional Keynesian models dominant in the 1950 s and 1960 s suggested an inflation-unemployment trade-off. In other words, there was a social cost of disinflation in terms of higher level of unemployment. However, if agents form their expectations rationally in a forward-looking manner, and if policymakers follow a credible and dynamically consistent policy to reduce the rate of inflation, then it might be shown that policies to reduce inflation

A. are ineffective.

B. are effective with much lower social cost than predicted by the traditional Keynesian models.

C. are effective only if monetary authorities do not announce their policies beforehand.

D. might also reduce unemployment, and hence be doubly beneficial.

Question 24

In an open economy with free capital flows, the Central Bank can control

A. the rate of interest but not the exchange rate of its currency

B. the exchange rate of its currency but not the rate of interest

C. both the rate of interest as well as the exchange rate of its currency by simultaneously setting both of them

D. either the rate of interest or the exchange rate of its currency but not both.

Question 25

The slope of the line tangent to the graph of $y = \ln\left(x^2\right)$ at $x = e^2$ is

A. $1/e^2$

B. $2/e^2$

C. $1/e^4$

D. $4/e^4$

Question 26

If $f(x) = \frac{x-1}{x+1}$ for all $1, x \neq -1$, then $f'(1) =$

A. -1

B. $-1/2$

C. 0

D. $1/2$

Question 27

The derivative of $f(x) = \frac{x^4}{3} - \frac{x^5}{5}$ attains its maximum value at $x =$

A. -1

B. 0

C. 1

D. $4/3$

Question 28

If f is a continuous function on $[ab$, which of the following is necessarily true?

A. f' exists on (ab).

B. If $f\left(x_0\right)$ is a maximum of f, then $f'\left(x_0\right) = 0$.

C. The graph of f' is a straight line.

D. $\lim_{x \to x_0} f(x) = f\left(\lim_{x \to x_0} x\right)$ for $x_0 \in (a, b)$

Question 29

If the solutions of $f(x) = 0$ are -1 and 2, then the solutions of $f\left(\frac{x}{2}\right) = 0$ are

A. -1 and 2

B. $\frac{-1}{2}$ and 1

C. -2 and 4

D. $\frac{-1}{2}$ and $\frac{5}{2}$

Question 30

Suppose that f is a function that is defined for all real numbers. Which of the following conditions assures that f has an inverse function?

A. The graph of f is concave up.

B. The graph of f is symmetric with respect to they-axis.

C. The function f is a strictly increasing function.

D. The function f is continuous.

Question 31

$\lim_{x\to 2} \frac{\sqrt{x+2}}{x-3} =$

A. -3

B. 2

C. -2

D. Does not exists

Question 32

The system of equations $4x + 6y = 5, 8x + 12y = 10$ has:

A. a unique solution

B. no Solution

C. infinitely many solutions

D. difficult to say

Question 33

Consider a standard normally distributed variable, a t-distributed variable with d degrees of freedom, and an F-distributed variable with $(1, d)$ degrees of freedom. Then which of the following statements is FALSE?

A. The standard normal is a special case of the t -distribution, the square of which is a special case of the F -distribution.

B. Since the three distributions are related, the 5% critical values from each will be the same.

C. Asymptotically, a given test conducted using any of the three distributions will lead to the same conclusion.

D. The normal and t- distributions are symmetric about zero while the F- takes only positive values.

Question 34

A normal distribution has coefficients of skewness and excess kurtosis which are respectively

A. 0 and 0

B. 0 and 3

C. 3 and 0

D. Will vary from one normal distribution to another

Question 35

What result is proved by the Gauss-Markov theorem?

A. That OLS gives unbiased coefficient estimates

B. That OLS gives minimum variance coefficient estimates

C. That OLS gives minimum variance coefficient estimates only among the class of linear unbiased estimators

D. That OLS ensures that the errors are distributed normally

Question 36

Which one of the following is NOT an assumption of the classical linear regression model?

A. The explanatory variables are uncorrelated with the error terms.

B. The disturbance terms have zero mean

C. The dependent variable is not correlated with the disturbance terms

D. The disturbance terms are independent of one another.

Question 37

What is the relationship, if any, between the normal and t-distributions?

A. A t-distribution with zero degrees of freedom is a normal

B. A t-distribution with one degree of freedom is a normal

C. A t-distribution with infinite degrees of freedom is a normal

D. There is no relationship between the two distributions.

Question 38

The type I error associated with testing a hypothesis is equal to

A. one minus the type II error

B. the confidence level

C. the size of the test

D. the size of the sample

Question 39

The mean, median and mode for binomial distribution will be equal when

A. $p = 0.5$

B. $p < 0.5$

C. $p > 0.5$

D. p = 1

Question 40

The collection of one or more outcomes from an experiment is called

A. Probability

B. Event

C. Random Variable

D. Random Experiment

GOKHALE MOCK

Question 1

How are the points $(3, 4)$ and $(2, -6)$ situated with respect to line $3x - 4y - 8 = 0$?

A. both lie on the line

B. both lie on the same side of zero on the line

C. each lies on the opposite sides of the zero on the line

D. None of the above

Question 2

Which of the following is not correct in respect of the sets A and B ?

A. If A B, then $B \cup A = B$

B. If A B, then $B \cap (A - B)\emptyset$

C. If A B, then $B \cap A = A$

D. If A $\cap B = \emptyset$ then neither $A = \emptyset$ or $B = \emptyset$

Question 3

What is the value of $\left[\log_{13}(10)\right] / \left[\log_{169}(10)\right]$

A. 1/2

B. 2

C. 1

D. $\log_{10}(13)$

Question 4

Train-A crosses a pole in 25 seconds and another Train-B crosses a pole in 1 minute and 15 seconds. Length of train- A is half length of train-B. What is the respective ratio between the speed of Train-A and Train-B?

A. 3 : 2

B. 3 : 4

C. 4 : 3

D. Cannot be determined

Question 5

Leena's monthly income is equal to the cost of 34 kg of groundnuts. Cost of 10 kg of groundnuts is equal to the cost of 20 kgs of apples. If cost of 12 kg of apples is Rs. 1500/−. What is Leena's annual salary?

A. Rs. 1 lac 20 thousand

B. Rs. 1 lac 2 thousand

C. Rs. 2 lac 20 thousand

D. Cannot be determined

Question 6

Pradeep invested 20% more than Mohit. Mohit invested 10% less than Raghu. If the total sum of their investment is = 17, 880, how much amount did Raghu invest?

A. Rs 6, 000

B. Rs 8,000

C. Rs5, 000

D. None of these

Question 7

What is the derivative of $y = x^x$?

A. x^{x-1}

B. $(x-1)x^{x-1}$

C. $e^{(1+x\ln(x))}$

D. $x^x(1+\ln(x))$

Question 8

Determine

$$\lim_{x\to\infty}\left(\frac{2x^3+4x}{3x^5-4x^2-2}\right)$$

A. 1

B. 2/3

C. 2/5

D. 0

Question 9

If $289 = 17^{x/5}$ then x =

A. 16

B. 8

C. 32

D. 2/5

Question 10

What is the solution to the following system of linear equations? $x_1 - 2x_2 + 2x_3 = 5$ $x_1 - x_2 = -1$ $-x_1 + x_2 + x_3 = 5$

A. There is no solution

B. $(x_1, x_2, x_3) = (1, 2, 4)$

C. $(x_1, x_2, x_3) = (2, 3, 10)$

D. $(x_1, x_2, x_3) = (1, 3, 5)$

Question 11

If the ratio of x to y is 25 times the ratio of y to x, then what is the ratio of x to y ?

A. 1 : 5

B. 5 : 1

C. 25: 1

D. 1 : 25

Question 12

A milk vender boaught 28 Litres of milk at the cost of Rs 8.50 per litre.After adding some water he sold the mixture at the same price .If he gains 12.5% profit on selling 28 litres. How much water did he add?

A. 5.5 Litres

B. 3.5 Litres

C. 1.5 Litres

D. 2.5 Litres.

Question 13

Half the people on a bus get off at each stop after the first, and no one gets on after the first stop. If only one person gets off at stop number 7 , how many people got on at the first stop?

A. 64

B. 32

C. 16

D. 8

Question 14

Which of the following statements about the correlation coefficient are true? I. The correlation coefficient and the slope of the regression line may have opposite signs. II. A correlation of 1 indicates a perfect cause-and-effect relationship between the variables. III. Correlations of +.87 and −.87 indicate the same degree of clustering around the regression line.

A. I only

B. II only

C. III only

D. I, II, and III

Question 15

What does $p < 0.05$ mean

A. the probability of the achance occurance of more than 1 in 2

B. the probability of a chance occurance of less than 1 in 20

C. the probability of a chance occurance of less than 5 in 20

D. the probability of a chance occurance of less than 1 in 100

Question 16

A sample of 400 Delhi households is selected and several variables are recorded. Which of the following statements is correct?

A. Total household income (in Rs) is interval level data.

B. Socioeconomic status (recorded as "low income", "middle income", or "high income" is nominal level data.

C. The number of people living in a household is a discrete variable.

D. The primary language spoken in the household is ordinal level data.

Question 17

When data are positively skewed, the mean will usually be

A. greater than the median

B. smaller than the median

C. equal to the median

D. positive

Question 18

In hypothesis testing, Type II error is made if

A. we reject the null hypothesis when the alternative hypothesis is true

B. we do not reject the null hypothesis when the null hypothesis is true

C. we reject the null hypothesis when the null hypothesis is true

D. we do not reject the null hypothesis when the alternative hypothesis is true

Question 19

P walked 20 metres towards North, took a left turn and walked 10 metres, then took a right turn and walked 20 metres, again took a right turn and walked 10 metres. How far is he from his starting point?

A. 50 metres

B. 60 metres

C. 40 metres

D. Cannot be determined

Question 20

If in the number 589463271 all the odd digits are first arranged in ascending order and then all the even digits are arranged in ascending order, which digit will be second to the right of fifth digit from the right end?

A. 5

B. 6

C. 2

D. 4

Question 21

If Star is called Planet, Planet is called Satellite, Satellite is called Galaxy, Galaxy is called Comet, then 'Earth' is classified under which category?

A. Galaxy

B. Comet

C. Planet

D. Satellite

Question 22

In the question below three statements are given followed by three Conclusions numbered I, II and III. Read all the conclusions and then decide which of the given conclusions logically follow(s) from the given statements disregarding commonly known facts. Statements: Some books are trees. All trees are roads. All roads are wheels. Conclusions: I. Some wheels are books. II. Some roads are books. III. Some wheels are trees.

A. Only I and II follow

B. Only II and III follow

C. Only I and III follow

D. All follow

Question 23

In a certain code ROPE is written as %57$, DOUBT is written as 35#8* and LIVE is written as @24$. How is TROUBLE written in that code?

A. *%5#8@$

B. *%#58@$

C. *%5#8@4

D. None of these

Question 24

17, 19, 47, ?

A. 53

B. 50

C. 41

D. 34

Question 25

Mohan correctly remembers that his father's birthday is before twentieth January but after sixteenth January whereas his sister correctly remembers that their father's birthday is after eighteenth January but before twenty- third January. On which date in January is definitely their father's birthday?

A. Eighteenth

B. Nineteenth

C. Twentieth

D. Data inadequate

Question 26

Four of the five numbers, 103, 131, 157, 217, 241 are similar in a certain way, and so form a group. Which is the one that does not belong to that group?

A. 217

B. 103

C. 241

D. 157

Question 27

↗ ↓ ↑ ?

A. ↓

B. ↗

C. ↘

D. →

Question 28

In a certain code JUST is written #@%$ and LATE is written s © ↑ $★. How is TASTE written in that code?

A. ★ ↑ %$

B. $ ↑ %$

C. $% ★ $

D. $% ↑ %★

Question 29

How many such digits are there in the number 7346285 , which are as far away from the beginning of the number, as they will be, when arranged in ascending order within the number?

A. None

B. one

C. two

D. more than three

Question 30

ABC : ZYX :: CBA : ?

A. ZXY

B. BCA

C. XYZ

D. XZY

Question 31

To maximize utility, a consumer with a fixed budget will purchase quantities of goods so that the ratios of the marginal utility of each good to its

A. total utility are the same

B. price are the greatest

C. price are equal to one

D. price are equal

Question 32

When firms, restructure their operations to decrease production costs, the aggregate supply curve, the price level and real output will change in which of the following ways?

A. Shift to the left, Increase, Increase

B. Shift to the left, Increase, No change

C. Shift to the right, Increase, Increase

D. Shift to the right, Decrease, Increase

Question 33

If the growth rate of the labour force exceeds the growth rate of output, which of the following will be true in the long run?

A. Wage rates will tend to remain constant

B. Wage rates will tend to fall

C. The number of unemployed people will fall

D. The level of employment does not change

Question 34

A profit-maximizing monopolist selects its output level in the

A. inelastic region of its demand curve

B. elastic region of its demand curve

C. range of output where marginal revenue is rising

D. range of output where marginal cost is falling

Question 35

Let W denote the nominal wage, P the output price and $\mathrm{MP_L}$ the marginal product of labor. Which of the following relationships correctly estimate the marginal cost (MC) of production for a perfectly competitive firm in the short run?

A. $MC = P/MP_L$

B. $\mathrm{MC} = \mathrm{P} \times \mathrm{MP_L}$

C. $MC = W \times MP_L$

D. $MC = W/MP_L$

Question 36

If a firm's long-run average total cost increases as output increases, the firm is experiencing

A. economies of scale

B. diseconomies of scale

C. increasing returns to scale

D. maximum economic profit

Question 37

A monopolistically competitive profit-maximizing firm is currently producing and selling 2000 units of output. At this level, marginal revenue is $9, average revenue is $10 and the average variable cost is $8. The product price is

A. $8

B. $9

C. $10

D. greater than $10

Question 38

Which of the following variable(s) are stock variable(s)? I. Consumer price index II. Gross domestic product III. Money supply IV. Exports

A. Both (I) and (III) above

B. I, II and III of the above

C. Only II above

D. All of the above

Question 39

The value of the slope of a production isoquant is equal to the

A. Amount of one input used divided by the amount of the other input

B. Ratio of the marginal utilities of the two inputs

C. Ratio of the marginal products of the two inputs

D. Ratio of the marginal costs of the two inputs

Question 40

Suppose the median disposable income measured in current rupees is 10000 and 20000 for 1978 and 1988 respectively. The economy's price index is 100 in the base year of 1978 and 250 in 1998 . Which of the following is true?

A. Nominal median disposable income rose 50% over the period

B. Real median disposable income rose 250% over the period

C. Real median disposable income fell 50% over the period

D. The Rs.10000 in 1978 , measured in 1988 rupees, is equivalent to Rs. 25000

Question 41

Two soft-drink firms, Fizzle & Sizzle, operate on a river. Fizzle is farther upstream, and gets cleaner water, so its cost of purifying water for use in the soft drinks is lower than Sizzle's by Rs 500000 yearly. According to this scenario, Fizzle and Sizzle

A. would be perfectly competitive if it costs Fizzle Rs500,000 yearly to keep that land.

B. would be perfectly competitive if it costs Fizzle Rs1,000,000 yearly to keep that land.

C. may or may not be perfect competitors, but their position on the river has nothing to do with it.

D. cannot be perfect competitors because they are not identical firms.

Question 42

An industry has 1000 competitive firms, each producing 50 tons of output. At the current market price of $10, half of the firms have a short-run supply curve with a slope of 1; the other half each have a short-run supply curve with slope 2. The short-run elasticity of market supply is

A. 3/10

B. 1/5

C. 2/5

D. none of the above

Question 43

Consider a regression model relating soft drink delivery time (y) to the number of cases delivered (x1) and a dummy variable for snow and ice (x2).X2 is 1 when the delivery route is snowy or icy and 0 otherwise. The estimated regression model is $Y = 20 + 2X_1 + 10X_2 + 1X_1X_2$. The regression indicates that the mean delivery time for 10 cases when there is snow or ice on the route is

A. 30

B. 40

C. 50

D. 60

Question 44

In an economy narrow money is equal to the sum of which of the following? i. RBI currency notes in circulation. ii. Rupee coins and notes in circulation. iii. Small coins. iv. Demand deposits with banks and other deposits with RBI.

A. Both (i) and (ii) above

B. Both (ii) and iii) above

C. Only (i), (ii) and (iv) above

D. All of (i), (ii), (iii) and (iv) above.

Question 45

The central bank is forced to accommodate fiscal policy under _____exchange rates, which makes fiscal policy a _____influence on equilibrium income.

A. fixed, powerful

B. fixed, powerless

C. flexible, powerful

D. flexible, powerless

Question 46

A pure private good is

A. nonrival in consumption and subject to exclusion.

B. rival in consumption and subject to exclusion.

C. rival in consumption and not subject to exclusion.

D. all of the above

Question 47

Price ceilings

A. always increase consumer surplus.

B. may decrease consumer surplus if demand is sufficiently elastic.

C. may decrease consumer surplus if demand is sufficiently inelastic.

D. always decrease consumer surplus.

Question 48

Suppose a firm in a perfectly competitive industry sells corn, and the firm's average variable cost (AVC) function is $(q - 3)2 + 3$. What is this firm's shutdown price?

A. 0

B. 4

C. 3

D. 9

Question 49

Suppose the production function of a firm is given by $f(x_1, x_2) = x_1^{0.5} x_2^{0.5}$. What is the technical rate of substitution at $x_1 = x_2 = 15$?

A. 15

B. 10

C. 1

D. -1

Question 50

Assume the Equilibrium GDP is $4,000 billion. Potential GDP is $5,000 billion. The marginal propensity to consume is 4/5(0.8). By how much and in what direction should government purchases be changed?

A. increase by $1,000 billion
B. decrease by $1,000 billion
C. increase by $100 billion
D. increase by $200 billion

Question 51

In the Keynesian aggregate-expenditure model, if the MPC is 0.75 and gross investment increases by $6 billion, equilibrium GDP will increase to

A. $6 billion
B. $8 billion
C. $12 billion
D. $24 billion

Question 52

The key feature of oligopoly is

A. excess capacity
B. high profitability.
C. product differentiation.
D. interdependence of firms.

Question 53

An example of a contractionary monetary policy is

A. an increase in the required reserve ratio.
B. a reduction in the taxes banks pay on their profits.
C. a decrease in the discount rate.
D. the Fed buying government securities in the open market

Question 54

Evidence that a horizontal LM curve occurred during the depression years would require showing that individuals

A. refused to spend excess money.
B. increased the spending of excess money.
C. sold bonds and bought goods.
D. were indifferent between holding money and bonds.

Question 55

The "compensated" demand curve is the demand curve that

A. shows only the income effect.

B. shows only the substitution effect.

C. shows both the income and substitution effects.

D. None of the above.

Question 56

If the demand curve for a good is upward sloping, then which of the following statements must be true? 1. The good is inferior. 2. The substitution effect is in the opposite direction to the income effect. 3. The substitution effect overwhelms the income effect.

A. 1 only.

B. 2 only.

C. 1 and 2 only.

D. 2 and 3 only.

Question 57

If leisure is an inferior good, the individual's supply curve for labor is

A. backward bending.

B. completely inelastic.

C. upward sloping.

D. perfectly elastic.

Question 58

A negatively sloped isoquant implies

A. products with negative marginal utilities.

B. products with positive marginal utilities.

C. inputs with negative marginal products.

D. inputs with positive marginal products.

Question 59

Suppose a firm is using only two inputs, labor and capital. What will happen if the price of labor falls?

A. The firm's average cost curve will shift downward.

B. The firm's marginal cost curve will shift downward.

C. To produce an unchanged output, the firm would use more labor.

D. All of the above.

Question 60

Along the long-run supply curve for a perfectly competitive industry, all of the following can vary except

A. the level of profits.

B. the number of firms in the industry.

C. input prices.

D. the level of input usage.

GOKHALE 2020

Question 1

If a set of data consists of only the first ten positive multiples of 5, what is the interquartile range of the set?

A. 15

B. 40

C. 27.5

D. 25

Question 2

The probability of rain is 1/6 for any given day next week. What is the chance it rains on both Monday and Tuesday?

A. 1/6

B. 1/12

C. 1/36

D. 1/3

Question 3

Eight women and two men are available to serve on a committee. If three people are picked, what is the probability that the committee includes at least one man?

A. 8/15

B. 1/4

C. 2/5

D. 1/32

Question 4

What is the range of the set of numbers comprised entirely of $\{1, 6, x, 17, 20, y\}$ if all terms in the set are positive integers and $xy = 18$?

A. 16

B. 19

C. 18

D. 17

Question 5

A driver purchases \$10 worth of gasoline at \$0.90 a gallon and \$10 at \$1.10 a gallon. What is the average price per gallon?

A. \$0.88 per gallon

B. \$1.99 per gallon

C. \$0.99 per gallon

D. $0.90 per gallon

Question 6

Which of the following statements about hypothesis tests is INCORRECT?

A. If the test statistic lies in the rejection region, we reject the claim.

B. In a one-tailed test, H1 involves either " > " or " < ", but not ".".

C. H0 must always include equality.

D. The claim can be either H0 or H1.

Question 7

Which will be the type of distribution, if the mean, median and mode of a distribution are $5, 6, 7$ respectively?

A. Not skewed

B. Symmetrical

C. Skewed negatively

D. Skewed positively

Question 8

A sample of 225 items is drawn from the population whose proportion is 0.10. What is standard error of the proportion?

A. 0.10

B. 0.90

C. 0.225

D. None of the Above

Question 9

Geometric Average can be simplified by

A. Change of scale

B. Change of Origin

C. Both A and B

D. None of the above

Question 10

Laspeyre's method satisfies

A. Circular test

B. Unit test

C. Time reversal test

D. Factor reversal test

Question 11

If a > b > c > d and a = 2, which of the following must be negative?

A. ab

B. aC

C. ad

D. None of the above.

Question 12

If a taxi charges $8.00 for the first mile, and $1.00 for each additional quarter mile, how much does the taxi charge for a 4.5 mile ride?

A. $16.00

B. $22.00

C. $18.00

D. $24.00

Question 13

Running on a 10 -mile loop in the same direction, Sue ran at a constant rate of 8 miles per hour and Rob ran at a constant rate of 6 miles per hour. If they began running at the same point on the loop, how many hours later did Sue complete exactly 1 more lap than Rob?

A. 3

B. 5

C. 4

D. 6

Question 14

The ratio of oranges to peaches to strawberries in a basket containing no other kinds of fruit is 2 : 3 : 4. If there are 8 oranges in the basket, a total of how many pieces of fruit are in the basket?

A. 16

B. 32

C. 36

D. 48

Question 15

Determine $\lim_{x\to\infty}\left(\frac{2x^3+4x}{3x^5-4x^2-2}\right)$

A. 1

B. 2/5

C. 2/3

D. 0

Question 16

The derivative of $\log x^3$ with respect to x is

A. $1/x^3$

B. $3x^2$

C. $3/x$

D. None of the above

Question 17

$\lim x \to \infty \sin x$

A. is zero

B. is infinity

C. oscillates between -1 and 1

D. is non-existent

Question 18

The center of a circle is $(5, -2)$.$(5, 7)$ is outside the circle, and $(1, -2)$ is inside the circle. If the radius, r, is an integer, how many possible values are there for r ?

A. 4

B. 5

C. 6

D. 7

Question 19

Three of the following four are alike in a certain way and so form a group. Which is the one that does not belong to that group?

A. 255

B. 170

C. 65

D. 50

Question 20

The next term in the series ABD, DGK, HMS, MTB, SBL, . . . is:

A. ZKW

B. ZCA

C. ZKU

D. KZU

Question 21

Two numbers are in the ratio 2 : 5. If 16 is added to both the numbers, their ratio becomes 1 : 2. The numbers are:

A. 16,40

B. 32, 80

C. 28,70

D. 20,50

Question 22

In certain code, "COVALENT" is coded as BWPDUOFM. The code of "ELEPHANT" will be:

A. MFUIQRTW

B. QMUBIADH

C. EPHNTEAS

D. QFMFUOBI

Question 23

Which of the following domains is used for profit businesses?

A. .org

B. .net

C. .com

D. .edu

Question 24

Two railway tickets from city A to B and three tickets from city A to C cost Rs. 177. Three tickets from city A to B and two tickets from city A to C cost Rs. 173 . The fare for city B from city A will be Rs.

A. 25

B. 27

C. 30

D. 33

Question 25

In the series AB, EDC, FGHI, ...?...., OPQRST, the missing term is

A. NMLKJ

B. JMKNL

C. NMKLJ

D. JKLMN

Question 26

A can run 224 metres in 28 seconds and B in 32 seconds. By what distance can A beat B?

A. 24 metre

B. 28 metre

C. 32 metre

D. 36 metre

Question 27

A train, 130 metres long travels at a speed of 45 km/hr crosses a bridge in 30 seconds. The length of the bridge is

A. 220 metres

B. 235 metres

C. 245 metres

D. 270 metres

Question 28

A clock is started at noon. By 10 minutes past 5 , the hour hand has turned through

A. 145°

B. 152°

C. 155°

D. 140°

Question 29

If 7 spiders make 7 webs in 7 days, then how many days are needed for 1 spider to make 1 web?

A. 1

B. 3

C. 7

D. 14

Question 30

3/8, 5/23, 7/46, 11/117, ?, 17/283

A. 15/221

B. 15/220

C. 13/165

D. 13/164

Question 31

If two goods are bad substitutes, indifference curve will:

A. Slope upwards

B. Approach a straight line

C. approach a right angle

D. be a straight line

Question 32

One key characteristic that is distinctive of an oligopoly market is that

A. there is only one firm that produces a product for which there are no good substitutes.

B. the decisions of one seller often influences the price of products, the output, and the profits of rival firms.

C. there are many sellers in the market and no seller can influence the price

D. None of the above

Question 33

Fiscal deficit less interest payments is called

A. Net fiscal deficit

B. Monetised deficit

C. Budgetary deficit

D. Primary deficit

Question 34

For a monopolist at equilibrium

A. marginal revenue is always higher than marginal cost

B. marginal revenue is always lower than marginal cost

C. marginal revenue is always lower than price

D. marginal revenue is always higher than price

Question 35

Suppose a firm in a perfectly competitive industry sells corn, and the firm's average variable cost (AVC) function is $(q-3)^2+3$. What is this firm's shutdown price and quantity?

A. 0

B. 3

C. 4

D. 9

Question 36

There are two economies A and B and the labor cost of producing unit output of two commodities is

	A	B
1	15	35
2	20	45

A. Country A has comparative advantage in producing commodity 2 and B in 1

B. Country A has comparative advantage in producing commodity 1 and B in 2

C. Neither country has any comparative advantage but A has absolute advantage

D. None of the above

Question 37

The weighted sum of the income elasticity of demand for all products of a consumer must be

A. equal to one

B. Between zero and one

C. equal to zero

D. Indeterminate

Question 38

In the Keynesian aggregate-expenditure model, if the MPC is 0.75 and gross investment increases by $6 billion, equilibrium GDP will increase by

A. $6 billion.

B. $8 billion.

C. $12 billion.

D. $24 billion.

Question 39

With its current levels of input use, a firm's MRTS is 3 (when capital is on the vertical axis and labor is on the horizontal axis). This implies

A. the firm could produce 3 more units of output if it increased its use of capital by one unit (holding labor constant).

B. the firm could produce 3 more units of output if it increased its use of labor by one unit (holding capital constant).

C. the marginal product of labor is 3 times the marginal product of capital.

D. if the firm reduced its capital stock by one unit, it would have to hire 3 more workers to maintain its current level of output.

Question 40

Consider the following statements when answering this question I. Increases in the demand for a good, which is produced by a competitive industry, will raise the short-run market price. II. Increases in the demand for a good, which is produced by a competitive industry will raise the long-run market price.

A. I and II are true.

B. I is false, and II is true.

C. I is true, and II is false.

D. I and II are false.

Question 41

If a country has a straight (downward sloping) production possibilities frontier, then production is said to be subject to

A. first increasing and then decreasing opportunity costs.

B. decreasing opportunity costs

C. increasing opportunity costs.

D. constant opportunity costs.

Question 42

Anand has a student loan that he pays a fixed 5% annual interest on. If all prices in the economy decline by 10%, Anand is

A. Worse off, since he now effectively pays 15% interest

B. Worse off, since he now effectively pays 10% interest

C. Better off, since he can now purchase 5% more goods and services

D. Unaffected, since he is not a lender of money

Question 43

The classical theory predicts that

A. considerable trade will occur between countries with different levels of technology.

B. small countries could obtain all of the gains from trade when trading with large countries.

C. countries will completely specialize in the production of export goods.

D. All of the above.

Question 44

The short-run aggregate supply curve is − − −, while the long-run aggregate supply curve is − − −.

A. Upward sloping; downward sloping

B. Upward sloping; vertical

C. Vertical; upward sloping

D. Upward sloping; horizontal

Question 45

A capital account surplus might be expected to cause a current account deficit because the associated

A. capital inflow would cause the nation's currency to appreciate, contributing to a trade deficit

B. capital inflow would cause the nation's currency to depreciate, contributing to a trade deficit

C. capital outflow would cause the nation's currency to depreciate, contributing to a trade deficit

D. capital outflow would cause the nation's currency to appreciate, contributing to a trade deficit

Question 46

Laffer Curve measures:

A. Relation between income and inequality

B. Relation between tax rate and amount of tax revenue collected

C. Relation between population and income

D. Total Income and total Expenditure

Question 47

Okun's law is the _____relationship between real GDP and the _____.

A. negative; inflation rate

B. negative; unemployment rate

C. positive; unemployment rate

D. positive; inflation rate

Question 48

As a result of a decrease in the value of the dollar in relation to other currencies, A merican imports decrease and exports increase. Consequently, there is a(n) :

A. increase in aggregate demand.

B. decrease in the quantity of aggregate output supplied in the short run.

C. increase in short-run aggregate supply.

D. decrease in the quantity of aggregate output demanded.

Question 49

Every year more and more purchases are made with credit cards on the Internet. Given this trend, all else equal, we would expect:

A. the money demand curve to shift inward.

B. the money demand curve to shift outward.

C. a downward movement along a fixed money demand curve.

D. an upward movement along a fixed money demand curve.

Question 50

Suppose that the economy is in long-run macroeconomic equilibrium and aggregate demand increases. As the economy moves to short-run macroeconomic equilibrium, there is:

A. a recessionary gap with high inflation.

B. a recessionary gap with low inflation.

C. an inflationary gap with low unemployment.

D. an inflationary gap with high unemployment.

Question 51

Assume that the United States faces an 8 percent inflation rate while no (zero) inflation exists in Japan. According to the purchasing power parity theory, over the long run the dollar would be expected to:

A. appreciate by 8 percent against the yen

B. depreciate by 8 percent against the yen

C. remain at its existing exchange rate

D. any of the above

Question 52

Let W denote the nominal wage, P the output price and MP_L the marginal product of labor. Which of the following relationships correctly estimate the marginal cost (MC) of production for a perfectly competitive firm in the short run?

A. $MC = W/MP_L$

B. $MC = P \times MP_L$

C. $MC = W \times MP_L$

D. $MC = P/MP_L$

Question 53

The law of diminishing returns begins at the level of output where

A. marginal cost is at a minimum

B. average variable cost is at a minimum

C. average fixed cost is at a maximum

D. none of the above is correct

Question 54

A pure private good is

A. nonrival in consumption and subject to exclusion.

B. rival in consumption and not subject to exclusion.

C. rival in consumption and subject to exclusion.

D. all of the above

Question 55

In India, while defining an urban area, the most important consideration besides the size of its population is that it should have

A. Half of its male working in non-primary sector

B. Three-fourth of its male working on non-agricultural pursuits

C. A police station, a college and a hospital

D. Number of ATMs, Number of Bank Branches

Question 56

When the supply is more elastic than demand

A. The tax incidence falls on the buyers

B. The tax burden is less on the sellers

C. Both (a) and (b)

D. None of the above

Question 57

An example of a contractionary monetary policy is

A. a decrease in the discount rate.

B. a reduction in the taxes banks pay on their profits.

C. an increase in the required reserve ratio.

D. the Fed buying government securities in the open market

Question 58

If the RBI adopts an expansionist open market operations policy, this means that it will

A. Buy securities from non-government holders

B. Offer commercial banks more credit in the open market

C. Sell securities in the open market

D. Openly announce to the market that it intends to expand credit

Question 59

In calculating buoyancy of a tax we consider

A. Only discretionary changes

B. Only automatic changes

C. Both ' A ' or 'B'

D. None of the above

Question 60

Suppose that investment (I) in the goods market is perfectly interest inelastic not responsive to the interest rate then

A. the IS curve is a vertical line and monetary policy does not affect output in the ISLM model.

B. the IS curve is a horizontal line and monetary policy is very effective in raising output.

C. the IS curve is a vertical line and monetary policy is very effective in raising output.

D. the IS curve is a horizontal line and monetary policy does not affect output in the IS-LM model.

GOKHALE 2021

Question 1

The sides of a triangle are in the ratio of 1/2 : 1/3 : 1/4. If its perimeter is 52 cm, the length of the smallest side is:

A. 9 cm

B. 10 cm

C. 11 cm

D. 12 cm

Question 2

Which number is missing in the following series? $3, 6, 10, 15, 21, 28, 36, ?$

A. 45

B. 46

C. 47

D. 51

Question 3

In a library having 400 members, every member reads 8 newspapers every day and every newspaper is read by 80 members. The number of newspapers s required every day is

A. at least 50

B. at most 45

C. exactly 40

D. exactly 8

Question 4

Insert the missing number: $8/62, 17/66, 36/72, 75/80, ?$

A. 154/90

B. 176/86

C. 153/88

D. 151/86

Question 5

A scooter costing Rs 12,000 was sold for Rs 10,400 after two years. The percentage loss is

A. 12.33%

B. 12%

C. 13.33%

D. 14%

Question 6

In an examination, 45% of the total students failed in Mathematics, 35% failed in English and 20% in both. The percentage of those who passed in both subjects is

A. 40

B. 20

C. 30

D. 10

Question 7

A person borrows Rs 15,000 partly at 10% and remaining at 12%. If at the end of 2years 6 months, he pays a total simple interest of Rs 4,050 , how much did he borrow at each rate?

A. Rs 8000@10% and 7,000@ 12%

B. Rs 9000@ 10% and 6,000@ 12%

C. Rs 10,000 @ 10% and5000@ 12%

D. none of the above

Question 8

Three individuals A,B,C hired a car on a sharing basis and paid Rs. 1,040. They used it for $7, 8, 11$ hours, respectively. What are the charges paid by B ?

A. Rs. 290

B. Rs. 320

C. Rs. 360

D. Rs. 440

Question 9

Which method used to examine inflation rate anticipation, unemployment rate, and capacity utilisation to produce products?

A. Data exporting technique

B. Data importing technique

C. Data supplying technique

D. Forecasting technique

Question 10

A numerical value used as a summary measure for a sample, is known as a

A. sample statistic

B. sample parameter

C. population mean

D. population parameter

Question 11

In a week the prices of a bag of rice were 360, 280, 340, 290, 320, 310, 300. The range is

A. 60

B. 80

C. 70

D. 100

Question 12

The mean of a distribution is 14 and the standard deviation is 6. What is the value of the coefficient of variation?

A. 42.8%

B. 60.4%

C. 35.7%

D. 27.8%

Question 13

The sum of the percent of frequencies for all classes will always equal

A. one

B. the number of classes

C. 100

D. the number of items in the study

Question 14

The middle value of an ordered array of numbers is the

A. Mode

B. Median

C. Mean

D. MidPoint

Question 15

In statistics, a population is defined as,

A. All People living in the area under study

B. All People living in a country

C. All subjects or objects whose characteristics are being studied

D. None of the above

Question 16

The three points that divides the set into 4 equal group are call

A. deciles

B. quartiles

C. percentiles

D. none of above

Question 17

Cumulative frequency polygon is also called

A. sigma

B. ogive

C. histogram

D. absicca

Question 18

If a constant value 25 is subtracted from each observation of a set, the variance is:

A. Reduced by 5

B. Reduced by 25

C. Increased by 25

D. Unaltered

Question 19

Which of the following statements are mutually contradictory? (i) All flowers are not fragrant. (ii) Most flowers are not fragrant. (iii) None of the flowers is fragrant. (iv) Most flowers are fragrant. Choose the correct answer from the code given below: Code:

A. (i) and (ii)

B. (i) and (iii)

C. (ii) and (iii)

D. (iii) and (iv)

Question 20

If A stands for 4, B for 6, C for 8, D for 10 and so on, then the following alphabets stand for 28, 32, 40, 16, 26 stands for

A. MOSGL

B. MORGl

C. NOPKL

D. LPOSI

Question 21

The letters in the first set have certain relationship. On the basis of this relationship, what is the right choice for the second set? AST : CUV : : NQV : ?

A. PRX

B. MPU

C. MRW

D. PSX

Question 22

August 17, 1980 was Sunday, what day was August 17,1979 :

A. Saturday

B. Sunday

C. Friday

D. Thursday

Question 23

Event A is sufficient but not necessary for Event B implies

A. Event B implies Event A has taken place

B. Event A implies Event B may or may not have taken place.

C. Event A implies Event B has taken place

D. None of the above

Question 24

Assertion (A): Man is having assimilation capacity. Reason (R): Man is a social being.

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true but (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. (A) is false but (R) is true

Question 25

The statement: "All intelligent men are poet" implies

A. All poets are intelligent men

B. Some poets are intelligent men

C. A "not intelligent" man can't be a poet

D. None of the above

Question 26

"All that glitters is not gold" implies

A. Some of the glittering objects are not gold.

B. Glittering is sufficient to be recognized as gold.

C. None of the glittering objects are gold.

D. None of the above.

Question 27

"All those who have higher immunity practices yoga regularly" implies

A. None of the above

B. Regular practice of Yoga is sufficient for higher immunity.

C. Those who have lower immunity do not practice yoga regularly.

D. Some of the people who practice yoga regularly have higher immunity.

Question 28

Five letters A, P, R, M, N have been arranged in the following rule, A&R will not be side by side; A should not come first; N should not come at the end; A should not be the second last. How should they be written:

A. RPANM

B. MARNP

C. PRNAM

D. NPARM

Question 29

The letters in the first set have a certain relationship. On the basis of this relationship mark the right choice for the second set: AST : BRU : : NQV :?

A. ORW

B. MPU

C. OPW

D. MRW

Question 30

There are five books A, B, C, D and E. The book C lies above D, the book A is below D, the book E is below A and B is below E. Which is at the bottom?

A. E

B. C

C. A

D. B

Question 31

Goldie chooses the bundle $(6, 6)$ when prices are $(6, 7)$ and she chooses the bundle $(10, 0)$ when prices are $(2, 5)$. We can conclude that

A. The bundle $(6, 6)$ is revealed preferred to $(10, 0)$ but there is no evidence that she violates WARP.

B. Neither bundle is revealed preferred to the other.

C. Goldie violates WARP.

D. The bundle $(10, 0)$ is revealed preferred to $(6, 6)$ and she violates WARP

Question 32

When the price of a product rises, consumers shift their purchases to other products whose prices are now relatively lower." This statement describes:

A. An inferior good

B. The rationing function of prices

C. The substitution effect

D. The income effect

Question 33

Consumer surplus is the area

A. Below the demand curve and above the price.

B. A bove the supply curve and below the price.

C. Above the demand curve and below the price.

D. Below the supply curve and above the price.

Question 34

The average cost function is given as AC = $1/3x^2 - 10x + 9$ The level of output at which average cost is equal to marginal cost is :

A. 15

B. 12

C. 18

D. 21

Question 35

Suppose incomes double over a period of years. Which sorts of product will experience the biggest increases in price?

A. Those with a PES close to 0.0 and an IED well below 0.0

B. Those with a PES well above 1.0 and an IED well above 0.0

C. Those with a PES well above 1.0 and an IED well below 0.0

D. Those with a Price Elasticity of Supply(PES) close to 0.0 and an Income Elasticity of Demand (IED) well above 0.0.

Question 36

Which of the following statements accurately describes relationship between AP and MP

A. AP rises when MP is above it and falls when MP is below it

B. MP intersects AP at the maximum of MP

C. AP and MP are always parallel to each other

D. AP is always increasing when MP is falling and vice versa

Question 37

Labor supply curve becomes backward bending when:

A. Substitution effect exceeds Income effect

B. Leisure becomes luxury good.

C. Any of the above situation

D. Income effect exceeds substitution effect.

Question 38

The price consumption curve will be down ward sloping if price elasticity

A. > 0

B. < 0

C. $= 0$

D. Price elasticity of X can't be predicted

Question 39

When consumer is neutral to good Y, the indifference curve will be,

A. Horizontal straight line

B. downward sloping

C. A single point in the commodity space

D. Vertical straight line,

Question 40

When marginal cost (MC) is increasing,

A. None of the above

B. AC > MC

C. MC > Ac

D. Ac = MC

Question 41

Suppose with the increase in consumer's income the demand for commodity X decreases, then which of the following is true,

A. X is a Giffen Good

B. X is not a Giffen good,

C. X is inferior as well as Giffen good.

D. X is an inferior good which may or may not be a Giffen good

Question 42

L-shaped iso-quant implies

A. Two factors are perfect substitutes

B. Two factors are perfect complements

C. one factor is not necessary

D. none of the above

Question 43

As per Keynesian theory Aggregate demand can be increased by:

A. selling bonds by RBI

B. increasing bank rate

C. decreasing cash reserve ratio

D. none of these

Question 44

Charging a different price in different markets where price elasticities are different is called

A. price discrimination

B. second degree price discrimination

C. third degree price discrimination

D. perfect price discrimination

Question 45

If $X_1 = f(P_1, P_2)$ and $X_2 = \phi(P_1, P_2)$, then the two commodities are substitutes if

A. $(\delta X1/\delta P2) < 0, (\delta X2/\delta P1) > 0$

B. $(\delta X1/\delta P2) > 0, (\delta X2/\delta P1) > 0$

C. $(\delta X1/\delta P2) > 0, (\delta X2/\delta P1) < 0$

D. $(\delta X1/\delta P2) < 0, (\delta X2/\delta P1) < 0$

Question 46

In CES production function : $Q = M\left[\alpha X_1^{-p} + (1-\alpha)X_2 - p\right]^{-1/p}$ Where Q is output and X_1 and X_2 are labour and capital. Elasticity of substitution is given by

A. $-p$

B. $-1/p$

C. $1/(1+p)$

D. M

Question 47

If an increase in the price of blue jeans leads to an increase in the demand for tennis shoes, then blue jeans and tennis shoes are

A. complements.

B. Substitutes

C. inferior goods.

D. normal goods.

Question 48

All internationally traded services are covered under which of the following WTO agreements?

A. TRIMS

B. TRIPS

C. GATS

D. PTA

Question 49

When interest payments are subtracted from gross fiscal deficit, we can get,

A. revenue deficit

B. gross primary deficit

C. capital deficit

D. none of the above

Question 50

As per Rybczynski theorem, the growth of only one factor at constant relative commodity prices, leads to an absolute expansion in the output of

A. All commodities

B. the commodity using the no growing factor intensively

C. the commodity using the growing factor intensively

D. none of the above

Question 51

The concept of vicious circle of poverty is associated with

A. J.M. Keynes

B. Ragner Nurkse

C. David Ricardo

D. Simon Kuznets

E. Adam Smith

Question 52

In whose growth model, entrepreneur's significance is crucial?

A. Solow

B. Schumpeter

C. Harrod

D. Domar

Question 53

The imposition of an import tariff by a large nation

A. usually improves the nation's terms of trade and increases the volume of trade.

B. worsens the nation's terms of trade but increases the volume of trade

C. usually improves the nation's terms of trade but reduces the volume of trade.

D. worsens the nation's terms of trade and reduces the volume of trade.

Question 54

Imposition of SPS measures by importing countries are sometimes considered as:

A. Quota

B. Technical Barriers to Trade

C. Export Subsidy

D. Non-tariff Barrier

Question 55

Elasticity of substitution is

A. A measure of the responsiveness of input ratio to a change in input-price ratio.

B. The rate at which the inputs (labour and capital) are substituted.

C. The substitution of cheaper inputs for dearer inputs.

D. A measure of the responsiveness of input prices and the substitution of the cheaper inputs.

Question 56

In liquidity trap,

A. both fiscal and monetary policy are fully effective

B. Fiscal policy and monetary policy both are partly effective

C. None of the above

D. Fiscal policy is fully effective but monetary policy is not at all effective

Question 57

According to Census of India, 2011 , current growth rate of Indian population is

A. Decreasing

B. Increasing

C. Unchanged

D. Sometimes increasing and sometimes decreasing

Question 58

Share of elderly population in India according to Census of India, 2011 , is

A. None of the above

B. 0 – 5%

C. 10 – 15%

D. 5 – 10%

Question 59

Classical Theory implies

A. Both (a) and (b)

B. No possibility of over-or under-production in the economy

C. State of full employment in the economy

D. None of the above

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Question 1

In Microeconomics, the market is conceived primarily as an institution for

A. creating new resources equitably

B. allocating resources equitably

C. creating new resources

D. allocating given resources

Question 2

Real gross domestic product (GDP) of an economy is best defined as:

A. The market value of goods and services produced in an economy

B. All goods and services produced in an economy stated in the prices of a given year

C. The market value of all final goods and services produced in an economy stated in the prices of a given base-year

D. The market value of goods and services produced in an economy stated in currentyear prices.

Question 3

While estimating Minimum Support Prices (MSP), the Commission for Agricultural Costs and Prices (CACP) in India analyzes which of the following factors? (Source: https://cacp.dacnet.nic.in)

A. Cost of production

B. Terms of trade between agriculture and non-agriculture

C. Price trends in the market, both domestic and international

D. All of the above

Question 4

A risk-loving or risk-seeking consumer

A. values an incremental increase in wealth less highly than an incremental decrease in wealth and will reject a fair gamble

B. values an incremental increase in wealth more highly than an incremental decrease in wealth and will see a fair gamble, may even accept some unfair gambles

C. will give same importance to each additional unit of increased money or wealth

D. None of these

Question 5

The trade triangle of a country shows

A. The positive extent of the exploitation by that country of its trading partners

B. That the country is only trying to export commodities without any imports

C. That the number of units of the imported commodity must exactly equal the number of units of the exported commodity

D. That the value of its total quantity of imports and the value of its total quantity of exports are equal

Question 6

In the Keynesian cross model, if the interest rate is constant, the MPC is 0.6, and taxes are increased by rupees 100, by how much does income change ?

A. It increases by rupees 160

B. It decreases by rupees 160

C. It decreases by rupees 150

D. It increases by rupees 150

Question 7

If the marginal propensity to consume (MPC) is large, then,

A. the IS curve relatively steep

B. the IS curve is relatively flat

C. the LM curve is relatively steep

D. the LM curve is relatively flat

Question 8

Consider the production function given here : $y = -x^3 + 6.x^2 + 15.x$, where y is output and x is input (capital). For what value of x will the marginal product of capital start decreasing?

A. $x = 1.5$

B. $x = 2.0$

C. x = 15

D. x = 3.0

Question 9

'Fiscal Deficit' in public finance is defined as a situation where

A. a government's total expenditures exceed the total revenue that it generates, including money from borrowings

B. a government's total expenditures exceed the total revenue that it generates, excluding money from borrowings

C. a government's total expenditures exceed the total tax revenues plus borrowings from international agencies

D. None of the above

Question 10

Which of the following is the alternative name of expected utility function?

A. Cobb-Douglas form of utility function

B. Stone-Geary utility function

C. von Neumann-Morgenstern utility function

D. Non-probability utility function

Question 11

Assumption of 'Non-satiation property' in consumer's utility analysis states that consumers

A. are satisfied with existing commodity prices and income level

B. are never satisfied with equilibrium point on the indifference curve

C. prefer less to more wealth and marginal utility of wealth is strictly negative

D. prefer more to less wealth and marginal utility of wealth is strictly positive

Question 12

When two commodities (X and Y) are perfect substitutes of each other, consumer's indifference curve will be

A. Rectangular hyperbola

B. Kinked shaped

C. Linear

D. Non-linear

Question 13

Which of the following is true when two indifference curves intersect each other ?

A. It violates assumptions of transitivity and more is better

B. Equilibrium solution is attained at the intersection point

C. Convexity property is not satisfied for each indifference curve

D. None of the above

Question 14

Which of the following is relevant for test for equality of variances of two populations?

A. z-statistic

B. t- statistic

C. χ^2 - statistic

D. F-statistic

Question 15

Classification of inputs of production into 'fixed inputs' and 'variable inputs' is

A. valid only in the short run

B. valid only in the long run

C. valid only in agriculture sector

D. none of the above

Question 16

The set of all technologically feasible production plans is called the firm's _____

A. input requirement set

B. technologically efficient production process

C. production function

D. production set

Question 17

Elasticity of substitution between two factor inputs for a Leontief isoquant is equal to _____

A. one

B. constant except one and zero

C. zero

D. infinity

Question 18

The theory of 'Optimal Currency Area' (OCA) was pioneered by the Economist,

A. Balassa-Samuelson

B. Paul Krugman

C. Robert Mundeil

D. Mundel-Fleming

Question 19

Operation of the principle of income multiplier assumes

A. Unchanging prices

B. Excess industrial capacity

C. Unemployed labour

D. All of the above

Question 20

If the economy is on the LM curve, but is to the left of the IS curve, aggregate output will and the interest rate will

A. fall, fall

B. fall, rise

C. rise, fall

D. rise, rise

Question 21

For a sample data, if Mean < Median < Mode, then the distribution is

A. skewed to the right (positive skewness)

B. skewed to the left (negative skewness)

C. symmetric

D. None of the above

Question 22

Which one is not an assumption of the Mahalanobi two-sector model?

A. the economy consists of two sectors - consumption goods and capital goods

B. the economy is open and free foreign trade operates

C. no changes in prices

D. full capacity production takes place

Answer the following three questions (23 to 25) based on the information below: Demand and supply functions in a competitive market are given as D = 40 − 4P and $S = 5P - 5$ respectively where P is the price of the commodity, D is the demand and S is the supply quantity.

Question 23

Quantity Q and price P at the equilibrium point will be equal to

A. $Q = 20$ units and $P = 5$ units

B. $Q = 5$ units and $P = 20$ units

C. $Q = 40$ units and $P = 55$ units

D. $Q = 4$ units and $P = 15$ units

Question 24

From the given information, which of the following statements is true ?

A. demand curve is downward sloping with a slope of +5 and supply curve is upward sloping with a slope of +40

B. demand curve is downward sloping with an intercept of −4 and supply curve is upward sloping with an intercept of +5

C. demand curve is downward sloping with a slope of −4 and supply curve is upward sloping with a slope of +5

D. None of the above

Question 25

If a commodity tax of rupee 1 per unit is levied, total government tax revenue collected will be equal to (approximately)

A. Rupees 100

B. Rupees 200

C. Rupees 5

D. Rupees 18

Question 26

Which of the following is not a part of 'Bertrand Paradox' definition?

A. differentiated products of producers

B. capacity or supply constraints of producers

C. non-zero total profits earned by producers

D. none of the above

Question 27

In a Stackelberg quantity leadership model, which is true?

A. Follower incorporates leader's reaction function in its profit maximization

B. Leader incorporates follower's reaction function in its profit maximization

C. Leader acts like a monopolist and all followers act like competitive firms

D. It is a one-shot-game where both leader and follower act simultaneously

Question 28

Given below are statements for a Cartel (i) Cartel acts like a monopoly (ii) Firms under Cartel compete on output quantity rather than on price (iii) Firms can earn higher profits in Cartel compared to Cournot Nash equilibrium (iv) Cartel can exist even in perfect competition also Which of the following statements is true?

A. Only (ii) is true

B. Only (iv) is true

C. Both (i) and (iii) are true

D. None of the above

Question 29

Which is not true for a perfect competition?

A. Non-homogeneous products of firms

B. Asymmetric information among buyers and sellers

C. Perfect competition market is capable of achieving pareto efficient allocation even when externalities are present

D. All of the above

Question 30

A price discriminating monopolist will be able to earn higher profit if

A. higher price is charged in the sub-market having a greater price elasticity of demand

B. lower price is charged in the sub-market having a greater price elasticity of demand

C. Price elasticities in all sub-markets are equal

D. Marginal cost in each sub-market is equal to the marginal revenue of total output

Question 31

The Marginal Productivity Theory of distribution is explained by J. B. Clark in his book

A. Social Justice without Socialism (1914)

B. Essentials of Economic Theory (1907)

C. The Distribution of Wealth: A Theory of Wages, Interest and Profits (1899)

D. The Philosophy of Wealth: Economic Principles Newly Formulated (1886)

Question 32

The problems of adverse selection in Economics arise due to

A. the principal can observe directly actions of agents

B. heavy taxations, monopoly market problems and symmetric information

C. the full information among economic agents on product qualities

D. a situation where sellers have information that buyers do not have, or vice-versa, about some aspects of product quality

Question 33

Consider a random experiment where two dice are rolled and all outcomes are equally likely. Let n1 be number that came up on the first die and let n2 be the number that came up on the second die. For the random variable, X = n1 + n2 what is expected value, E[X] ?

A. 6

B. 7

C. 7.5

D. 8

Question 34

The speculative demand for money is a function of

A. Level of income

B. Level of prices

C. Rate of interest

D. Level of profits

Question 35

Keynes identified that large chronic unemployment during the worldwide economic depression of 1930 s was a result of

A. Non-clearing labour market and low wage rates

B. High real interest rates

C. Voluntary choice of employment opportunities by workers

D. Failure of effective demand

Question 36

A barter economy is different from a money economy in that a barter economy

A. promotes market exchange value

B. involves higher costs for each transaction than a money economy

C. encourages specialization and division of labour

D. eliminates the need for a double coincidence of wants

Question 37

When two regression lines (of Y on X and X on Y) coincide each other, then

A. there will be very low relations between X and Y

B. the correlation coefficient between Y and X is not perfect

C. the correlation coefficient between X and Y is perfect

D. We cannot say anything on correlation coefficient between Y and X

Question 38

Which is true for the Binomial distribution?

A. The random experiment is performed repeatedly a finite and fixed number of times

B. The outcome of the random experiment results in dichotomous events

C. All the trials are independent

D. All of the above

Question 39

Which one of the following statements is not true?

A. t-test and F-test are parametric tests

B. χ^2 -test is generally a non-parametric test

C. Small sample tests can be used even for large samples but reverse is not always true

D. t-statistic is for testing overall statistical significance, i.e., for testing model parameters as a whole taken together at a time

Question 40

Interchange of any two rows or two columns will alter the _____of a determinant

A. sign, but not the numerical value

B. the numerical value but not the sign

C. both the sign and numerical value

D. neither the sign nor the numerical value

Question 41

Which is true for the Ricardian model of international true?

A. if a country has a comparative advantage in a good, it cannot have an absolute advantage in that good

B. if a country has an absolute advantage in a good, it also has a comparative advantage in that good

C. a country with a comparative advantage in all goods cannot gain from trade

D. a country can have a comparative advantage in a good, at the same time that it has an absolute advantage in that good

Question 42

Which of the following statements on "Linear Programming Problem" is true?

A. Only objective function is linear and constraints can be non-linear

B. Only constraint functions are linear and objective function can be non-linear

C. All constraint functions and objective function are linear

D. Variables are non-negative and all constraint functions are of mixed type

Question 43

The value of the definite integral $\int_0^2 (2-3x)dx$ is equal to

A. +2

B. zero

C. $2x - 3x^2 + c$ where c is a constant

D. −2

Question 44

The National Institution for Transforming India (NITI) was created on ..

A. 2^{nd} October, 2016

B. 1^{st} January, 2015

C. 2^{nd} October, 2015

D. 1^{st} January, 2016

Question 45

According to the Composite SDG (Sustainable Development Goals) India Index 2018 , two top performing states are

A. Punjab and Maharashtra

B. Kerala and Himachal Pradesh

C. Assam and Tamil Nadu

D. Andhra Pradesh and Telangana

Question 46

Which category of items is currently outside the purview of GST in India?

A. Tyres and tubes, office furnitures and cloth items

B. Agricultural equipments and musical intruments

C. Petroleum products, electricity and alcohol for human consumption

D. None of the above

Question 47

Pigouvian tax is a

A. tax on the real wealth of high income group households

B. tax on the income gains from lottery activities like 'Kaun Banega Crorepati'

C. corrective tax on any economic activity that generates negative externatilies

D. corrective tax on direct income to reduce income inequalities

Question 48

In Indian tax system, which is not true for Goods and Services Tax (GST)?

A. The Union Finance Minister is the chairperson of GST Council

B. It has a direct impact on the direct tax structure

C. GST system follows multiple tax rates

D. It has mainly two parts - Central GST and State GST

Question 49

Pure public goods have the characteristics of

A. Non-excludability

B. Non-rival consumption

C. Non-rejectable

D. All of the above

Question 50

What is the minimum value of the function $f(x) = 4x^2 - 4x + 1$?

A. 0

B. 1/2

C. 1

D. -4

Question 51

Comparisons of GDP levels across various countries are most accurate when:

A. Prices and the values of non-market activities are the same across countries

B. Prices are the same across countries

C. Prices for non-market activities are the same across countries

D. The value of non-market activities is the same across countries

Question 52

The Gresham's Law in economics is associated with which statement?

A. Too much of high quality products and too low of low quality products are sold out

B. Too much of low quality products and too low of high quality products are sold out

C. Good money drives out bad money out of circulation

D. Bad money drives out good money out of circulation

Question 53

Under a flexible exchange-rate system, the Indian rupee will appreciate against the Japanese Yen when

A. India has a trade deficit with Japan

B. India's inflation rate exceeds Japan's inflation rate

C. Real interest rates in India increase relatively higher to those in Japan

D. Japan's money supply decreases while India's money supply increases $T - 32$

Table 1 : Macro data for an economy

Items	Crores of Rupees
Consumption	4800
Investment	1250
Transfer payments	1055
Government expenditures	1250
Exports	1100
Imports	900

Question 54

In Table 1 , the gross domestic product (GDP) is equal to

A. 7300

B. 7500

C. 10355

D. 9300

Question 55

In Table 1, the net exports of the economy is equal to

A. 6400

B. 2000

C. 200

D. 900

Question 56

Which of the following describes the liquidity trap situation?

A. the horizontal portion of the liquidity preference curve

B. the demand for money is infinitely elastic with respect to interest rate

C. Reductions in interest rate decreases people's desire to hold cash balances

D. Both (A) and (B) are true

Question 57

If there is an exogenous increase in money supply, then,

A. There will be more money available for speculative purposes

B. The price of bonds will fall as all people attempt to sell bonds

C. The demand for transaction balances will rise

D. None of the above

Question 58

Hyperinflation usually occurs when

A. Firms demand higher and higher prices while selling their products

B. the country's government is forced to print money to finance its spending

C. People start spending too much money for consumption

D. Fiscal deficits are maintained at a small amount

Question 59

Based on which assertion, Milton Friedman challenged Keynesian economics?

A. Short-run stability of demand for money

B. Long-run stability of demand for money

C. Short-run instability of demand for money

D. Interest inelasticity of money demand

Question 60

Significance level in estimation of a parameter can be related to

A. Type I error

B. Type II error

C. Both Type I and Type II errors

D. Variance of the sample

Question 61

Consider an estimator Tn = $t(X1, X2, \ldots, Xn)$ based on a random sample of size n for a parameter θ for some random variable, X. If it is found that Var(Tn) is minimum among the given class of estimators for θ, then Tn is said to be:

A. consistent

B. efficient

C. unbiased

D. sufficient

Question 62

Which of the following is a trade weighted average of a country's bilateral exchange rates, expressed as an index number relative to the base year?

A. Real exchange rate

B. Effective exchange rate

C. Floating exchange rate

D. Bilateral exchange rate

Question 63

Which of the following policy choices represents a combination of fiscal and monetary policies designed to bring the economy out of a recession?

A. Increasing both taxes and the discount rate

B. Decreasing both taxes and the money supply

C. Increasing government spending and decreasing the central bank rate

D. Increasing both taxes and the money supply

Question 64

Which of the following is a recent paradox in trends in inflation rates in India?

A. Inflation rates based on WPI and CPI are decreasing

B. Inflation rates based on WPI and CPI are increasing

C. Inflation rate based on WPI is increasing & inflation rate based on CPI is decreasing

D. Inflation rate based on WPI is decreasing & inflation rate based on CPI is increasing

Question 65

Which of the following a British economist whose contributions are seen as constituting the economic theory offered by Mercantilism?

A. Adam Smith

B. Thomas Mun

C. J. S. Mill

D. J. M. Keynes

Question 66

'Division of Labour' in Adam Smith's economic analysis implies

A. Specialisation

B. Social security

C. Minimum needs

D. None of the above

Question 67

A monopolist is trying to maximize total profit. He has the following average revenue function $P = 63 - 4Q$ and the total cost function is given by $TC = 20 + 15Q$ where Q is the output and P is the output price. What is the total profit of the monopolist?

A. 63

B. 124

C. 155

D. 529

Question 68

The name of Francois Quesnay is associated with

A. Capital accumulation and system of natural liberty

B. The Gospel of Wealth

C. Tableau Economique and ideas of the physiocrats

D. Tableau Economique and ideas of building a wealthy and powerful state

Question 69

Who defined "Economics is the science which studies humań behaviour as a relationship between ends and scarce means which have alternative uses"?

A. Alfred Marshall

B. Lionel Robbins

C. David Ricardo

D. P. A. Samuelson

Question 70

The Fisher Effect in economics states that the real interest rate equals the nominal interest rate minus the expected inflation rate (typo).

A. minus the expected exchange rate

B. plus the expected interest rate

C. minus the expected inflation rate

D. plus the expected inflation rate

Question 71

The basic of objective behind holding Buffer Stocks by Food Corporation of India is _____

A. to cater to targeted public distribution system

B. to enable farmers to meet their costs of production

C. to meet the requirements of rich

D. to stabilize prices during acute situations

Question 72

India does not import any milk or milk products from which country ? It was banned due owing to presence of toxic melamine content in milk which started in September 2008 and is being extended till December 23,2018 or until further orders.

A. Pakistan

B. China

C. Bangladesh

D. Singapore

Question 73

In which of the following Acts in India, the target was set for reduction in revenue deficit and fiscal deficit only, and not for primary deficit?

A. The Fiscal Responsibility and Budget Management (FRBM) Act, 2003

B. The Fiscal Responsibility and Budget Management (FRBM) Act, 2005

C. The Finance Commission of India Act, 2016

D. Revenue and Expenditure Management Act, 2017

Question 74

Consider the following matrix: $H = \begin{pmatrix} -3 & 4 & -1 \\ 4 & -6 & 2 \\ -1 & 2 & -10 \end{pmatrix}$ Then,

A. Matrix H is positive semi-definite

B. Matrix H is positive definite

C. Matrix H is negative definite

D. Matrix H is indefinite

Question 75

Widespread agrarian crisis in India is largely emanates from _____

A. excessive import competition to farm sector

B. inadequate credit to the farm sector

C. inadequate output prices for the crops

D. outdated farm management of the farmers

Question 76

WTO formation and implementations of its agreements have benefitted many developed countries but failed to benefit many developing countries, because _____

A. Developed countries imposed high tariffs

B. Developing countries reduced their exports

C. Developing countries could not reduce their subsidies

D. Developed countries continued their invisible subsidies

Question 77

One of the main successes of Mid Day Meal Programme of the Government of India is

A. removing mass starvation

B. solving the problem of vaccination deficit

C. reducing high dropout rate in schools

D. reducing learning disability

Question 78

In which of the following years, University of Hyderabad was established?

A. 1974

B. 1975

C. 1976

D. 1979

Question 79

Contributions of six sectors, viz., agriculture, forestry and logging, fishing, mining and quarrying, manufacturing, and construction to the Gross Domestic Product (GDP) of India is estimated with the adoption of

A. Income method

B. Expenditure method

C. Product method

D. A combination of any two of the above methods

Answer following three questions (80 and 82) from information given in Diagram 1 Diagram 1: The initial equilibrium of the consumer is at point A where indifference curve 11 is tangent to the budget line BCl. If the price of commodity Y falls, the budget line shifts to BC2 and new equilibrium of the consumer is at point C.

Question 80

In Diagram 1, the movement of the consumer from point A to point C is due to

A. Utility effect

B. Price effect

C. Income effect

D. Substitution effect

Question 81

In Diagram 1 , the movement of the consumer from point A to point B is due 'to

A. Utility effect

B. Price effect

C. Income effect

D. Substitution effect

Question 82

In Diagram 1, good Y is an inferior good because

A. point C is to the right of point A such that Y2 > Y1

B. point C is to the left of point B such that Y2 < Ys

C. point B is to the right of point A such that Ys > Y1

D. none of the above

Question 83

Currently, Assam contributes about _____of total tea production of India. (Source: www.teaboard.gov.in)

A. 25%

B. 50%

C. 85%

D. 92%

Question 84

As per the 2011 census of India, which state had the highest literacy rate ? (Source: https://www.census2011.co.in/facts/highstateliteracy.html)

A. Kerala followed by Mizoram and Lakshadweep

B. Kerala followed by Tripura and Puducherry

C. Tripura followed by Kerala and Mizoram

D. Tripura followed by Kerala and Goa

Question 85

In Diagram 2, which of the following statements is not true ?

A. Contribution share of services has been higher than that of industry after 1950 – 51

B. Contribution shares of both services and industry sectors to GDP in India have been increasing during post-liberalization period

C. Share of industry's contribution in GDP increased by 15 percentage points during 1950 – 51 to 2017 – 18

D. Share of services sector's contribution in GDP increased by 15 percentage points during 1991 – 92 to 2017 – 18

Question 86

In the general equilibrium analysis, which is related to re-distribution of wealth?

A. First Fundamental Theorem of Welfare Economics

B. Second Fundamental Theorem of Welfare Economics

C. Coase Theorem

D. Walrasian Tatonnement Process Theorem

Question 87

To sell commodities at their cost of production in competitive markets and yet be able to make a surplus over and above cost of production as a contradiction in the general formula of capital has been identified by which of the following scholars?

A. David Ricardo

B. Adam Smith

C. Karl Marx

D. Joseph Stiglitz T-32

Question 88

In general equilibrium models, which one is the definition of Numeraire price ?

A. Price of a commodity which makes the excess demand as equal to zero

B. Price at which the total profit is the maximum

C. Price at which the pareto optimal condition is satisfied

D. Price of a commodity taken as constant (generally as equal to 1) and other prices are interpreted as being measured relative to it

Question 89

Which of the following will describe the simplest model of Robinson Crusoe Economy?

A. One producer, one consumer and one good

B. One producer, one consumer and two goods

C. Two consumers and two goods

D. Two goods, two factors and two consumers

Question 90

Which is not related to 'Contract Curve' of pareto efficient allocations?

A. Edgeworth Box is used for analysis with 2 goods and 2 consumers

B. It is a set of pareto efficient allocations where production is involved

C. It occurs as a result of mutually beneficial trading between 2 consumers

D. It assumes fixed endowments of goods and no production is involved

Question 91

Which is not a reason for the existence of increasing opportunity costs?

A. Technology differs among countries

B. Inputs are not used in the same fixed proportion in production of all goods

C. Factors of production are not homogenous

D. For a country to produce more of a good, it must use resources that are less and less suited to the production of that good

Question 92

Consider following statements on the Pure theory of international trade: Statement 1: The central concern of the pure theory of international trade is to explain the causes of international trade and the determination of the equilibrium prices and quantities of traded goods and to analyze the effects of trade on economic welfare. Statement 2: The pure theory of international trade is concerned with both positive and normative questions. Which of the following statements is true?

A. Only statement 1 is true

B. Only statement 2 is true

C. Both statement 1 and 2 are true

D. Both statement 1 and 2 are false

Question 93

Which one of the following transactions constitutes the best form of capital injections?

A. The home country receives aid from the International Monetary Fund

B. Immigrant workers transfer their salaries to their home countries

C. The government raises taxes and uses the proceeds to buy computers abroad

D. Domestic firms invest in foreign countries

Question 94

The Heckscher-Ohlin theory of international trade states that

A. a country will import goods that use its abundant factors intensively, and export goods that use its scarce factors intensively.

B. a country will import goods that use its abundant factors intensively, and will not export any goods

C. a country will export goods that use its abundant factors intensively, and will not import any goods

D. a country will export goods that use its abundant factors intensively, and import goods that use its scarce factors intensively

Question 95

A macroeconomic indicator for which there is no annual data in India is

A. GDP

B. Net exports

C. Employment

D. Money supply

Question 96

Given the function $y = x^4 + x$, second order derivative of y with respect to x is .....

A. $4x^3 + x^2$

B. 12x

C. $4x^3 + 1$

D. $12x^2$

Question 97

Which is true for the Solow growth model? When the propensity to save increases, then the aggregate production function

A. becomes linear and slopes downward

B. remains constant and becomes horizontal

C. shifts upwards

D. shifts down continuously

Question 98

Incremental capital-output ratio is assumed to be _____in Harrod-Domar model of growth

A. increasing continuously

B. decreasing and it tends to be zero

C. increasing first and then decreasing

D. constant

Question 99

Which two economists won Economics Nobel Prize in 1969 "for having developed and applied dynamic models for the analysis of economic processes"?

A. James A. Mirrlees and Paul A. Samuelson

B. Trygve Haavelmo and Milton Friedman

C. Jan Tinbergen and Ragnar Frisch

D. Robert M. Solow and L. R. Klein

Question 100

Which is not included in Human Development Index (HDI) calculation?

A. Life expectancy

B. Educational attainment

C. Per capita GDP

D. Unemployment

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Question 1

In the Harrod growth model, if the warranted growth rate exceeds the natural rate of growth, there is a tendency for _____

A. secular inflation

B. chronic depression

C. secular deflation

D. full employment

Question 2

If all prices in one country (country A) are higher than all prices in another country (B) when compared at the wage rates that happen to prevail in the two countries. If the countries share the same currency and the nominal wage rate in country B remains fixed

A. the nominal wage rate in country A will have to fall

B. unemployment must be higher in country B than in country A

C. the real wage in country A must be higher than in country B

D. workers in country A must be less productive than workers in country *B*

Question 3

If the utility function is given by $U(x_1, x_2) = x_1 + x_2$, which is true about the marginal rate of substitution (MRS) between two commodities x_1 and x_2 at positive level of consumption and also the nature commodities?

A. MRS is constant at 1 and commodities are perfect complements

B. MRS is constant at 1 and commodities are perfect substitutes

C. MRS is not constant and commodities are substitutes

D. MRS is not constant and commodities are complements

Question 4

Consider the following matrix: $S = \begin{pmatrix} -2 & 5 \\ 1 & -3 \end{pmatrix}$ Then, the matrix S is:

A. positive definite

B. negative definite

C. negative semi-definite

D. indefinite

Question 5

In general, risk-loving person will

A. always accept a gamble

B. always accept unfair gambles

C. always accept fair gambles

D. none of the above

Question 6

The price leadership model in Oligopoly market is an example of

A. a price game between a leader and consumers

B. a quantity game between a quantity leader and a price leader

C. simultaneous actions game in price competition

D. sequential action game

Question 7

Let X1, X2, X3 be non-null convex sets. Then, which of the following is convex?

A. $X1 \cap X2 \cap X3$

B. $X1$ UX2 UX3

C. $X1 \cap X2 U X3$

D. $X1 \cup X2 \cap X3$

Question 8

Which of the following research methods did Abhijit Banerjee, Esther Duflo and Michael Kremer, who shared Nobel Prize for 2019 in economics for innovation in poverty studies, adopt:

A. Random sampling

B. Stratified random sampling

C. Customized Random Sampling

D. Randomized controlled trials

Question 9

'Run on the bank' in banking parlance means:

A. an impressive increase in bank's profits

B. a massive demand for withdrawal of money by depositors

C. hostile takeover of the bank by its rivals

D. a fall in the NPAs of the bank

Question 10

When a country devalues its currency, we expect that

A. income will rise because the devaluation stimulates aggregate demand.

B. income will rise because the devaluation stimulates aggregate supply.

C. income will fall because the devaluation reduces aggregate demand.

D. income will fall because the devaluation reduces aggregate supply.

Question 11

Information on Gini coefficient and Correlation coefficient values are given below: I. Gini coefficient value ranges from 0 to +1 II. Gini coefficient value ranges from +1 to −1 II. Gini coefficient value ranges from 0 to +100 - IV. Pearson's correlation coefficient value ranges from −1 to +1 V. Pearson's correlation coefficient value ranges from 0 to +1 VI. Pearson's correlation coefficient value ranges from +1 to +100 Which one of the following is correct?

A. Only I and V are correct

B. Orly Π and V are correct

C. Only III and VI are correct

D. Only I and IV are correct

Question 12

Let A be an upper triangular matrix of order n with diagonal elements $a_{ii} \neq 0$ for all $i = 1, 2, \ldots n$ and trace$(A) = 0$. Then,

A. A is non-singular

B. A is a positive definite matrix

C. A is idempotent

D. A is a negative definite matrix

Question 13

Assertion (A): The current account measures a country trade in currently produced goods and services, along with unilateral transfers between countries. Reason (R): Unilateral transfers are payments from one country to another that do not correspond to the purchase of any good, service, or asset.

A. both A and R are individually true and R is the correct explanation of A

B. both A and R are individually true but R is not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

Question 14

The maximum size of the type I error, which we are prepared to risk is known as the:

A. power of the test

B. degree of confidence

C. level of significance

D. confidence coeficient

Question 15

Consider the following production function: $y = -x^3 + 18x^2 + 45x$, where y is output and x is input (labour). For what value of x will the marginal product of labour start decreasing?

A. $x = 3.0$

B. $x = 6.0$

C. $x = 6 + \sqrt{51}$

D. Does not exist

Question 16

The Phillips curve indicates that when the labour market is _____, production costs will _____and aggregate supply decreases.

A. easy; rise

B. easy; fall

C. tight; fall

D. tight; rise

Question 17

If $m : n = 3 : 2$, then find the ratio of $(4m + 5n) : (4m - 5n)$

A. 30 : 20

B. 11 : 1

C. 6 : 5

D. 9 : −1

Question 18

Which of the following statements better describe the concept of money neutrality in the long run:

A. the change in money supply doesn't affect prices in the long run

B. the increase in money supply leads to an increase in both prices and output

C. the change in money supply doesn't affect prices in the short run

D. the change in money supply doesn't affect the real output in the long run

Question 19

Which of the following names is associated with theory of Entrepreneurship

A. Alfred Marshall

B. Ronald Coase

C. Joseph Schumpeter

D. Graham Pyatt

Question 20

Suppose we have estimated the regression model, $y_i = \beta_1 + \beta_2 x_{i2} + \cdots + \beta_K x_{iK} + e_i$ Let $\hat{y}_i$ be the fitted value of y_i for each i. Now, we estimate the artificial model, $y_i = \beta_1 + \beta_2 x_{i2} + \cdots + \beta_K x_{iK} + \gamma_1 \hat{y}_i + \gamma_2 \hat{y}_i + v_i$ to test $H_0 : \gamma_1 = \gamma_2 = 0$ against $H_1 : H_0$ is wrong. Choose the correct statement.

A. H_1 can be equivalently rewritten as $H_1 : \gamma_1 \neq 0$ and $\gamma_2 \neq 0$

B. An F-test cannot be appropriate for testing H_0.

C. This test is called the Gauss Markov Theorem

D. Rejection of H_0 suggests that there can be omitted variables.

Question 21

In the Lewis model, what does the term "surplus labour" refer to?

A. An amount of labour that is so high that it deflates wages throughout the economy

B. Labour that can be withdrawn from the low productivity agricultural sector without a decrease in the total production

C. Labour that is exploited by the capitalist class.

D. Labour that can be withdrawn from the industrial sector without a decrease in the total production.

Question 22

What is Ricardian equivalence proposition?

A. The tax cuts do not affect desired consumption and desired national saving.

B. The tax incentives do not affect desired consumption but impacts on desired national saving.

C. The tax cuts do affect desired consumption and desired national saving.

D. The tax cuts do affect desired consumption and do not affect desired national saving. $\omega = 33$

Question 23

Which among the following is not correct?

A. During inflation lenders suffer and borrowers benefit out.

B. Rising inflation indicates lower purchasing capacity among the consumers.

C. With rising inflation, the currency of the economy depreciates provided that it follows the flexible curtency regime.

D. Inflation decreases the nominal value of the wages while the real value increases.

Question 24

The duality concept in a Linear Programming Problem states that, corresponding to every given minimization program (to minimize C), there exists a counterpart maximization program (to maximize a new variable, say Maximize Π), with the propcrty that _____

A. Minimum C = Maximum Π and the optimal feasible solutions do exist

B. Minimum C = Maximum Π and the optimal feasible solutions do not exist

C. Minimum C $\neq$ Maximum Π and the optimal feasible solutions do exist

D. Minimum $C \leq$ Maximum II and the optimal feasible solutions do not exist

Question 25

What types (increasing/decreasing) of absolute risk aversion A(w) and relative risk aversion R(w) will be observed for the Investor X, whose utility function is u(w) = log(w), (where w is the total wealth and w is strictly positive) ?

A. The investor X exhibits increasing A(w) and constant R(w)

B. The investor X exhibits decreasing A(w) and constant R(w)

C. The investor X exhibits increasing A(w) and decreasing R(w)

D. The investor X exhibits increasing $A(w)$ and $R(w)$ $w - 33$

Question 26

Equation $f(x) = 2x^2 - 5x + 6$ has,

A. two identical real roots

B. two distinct real roots

C. two distinct complex roots

D. one real root and one complex root.

Question 27

A feature that distinguishes financial markets from goods markets

A. regulation

B. futures trading

C. cross-border trading

D. financial products are promises to pay

Question 28

The economist who received a Nobel Prize for demonstrating that government policies play a critical role in fostering technological innovation...

A. Paul. M. Romer

B. William D Nordhaus

C. Oliver Hart

D. Jean Tirole

Question 29

Daily peak temperature for two summer months is recorded in units of degree Fahrenheit (F) for a study of impact of daily temperature on electricity consumption (E), measured in thousand units. It is found that between the two variables F and E, there is a positive correlation, r. If it is required that temperature measurements be converted to degree Celsius (C), then the value of correlation between temperature, C and electricity consumption, E:

A. increases upon change of scale

B. decreases but remains positive

C. decreases and becomes negative

D. remains the same

Question 30

In an economy undergoing financial innovations such as widespread use of ATM machine making money demand less elastic compared to pre-innovation times, one would expect

A. both the IS and LM curves to be flatter.

B. the LM curve to become flatter.

C. the LM curve to become steeper.

D. LM curve to shift.

Question 31

The production function has this property:

A. techniques are ordered according to capital intensity

B. techniques are reversible according to relative factor prices

C. factor inputs are substitutable in production

D. all of the above

Question 32

If international trade takes place as a result of comparative advantage, it will cause which of the following effect in the participating countries?

A. Inequality among households will be reduced.

B. All individuals in one country will be worse off.

C. The average well-being of people in both countries will increase.

D. One country will grow faster over time.

Question 33

The covariance between the length and weight of five items is 6 and their standard deviations are 2.45 and 2.61 respectively. Then the correlation coefficient between the length and weight is ∴.

A. very near to zero.

B. 0.9974

C. 0.6575

D. 0.9383

Question 34

Timex Design Inc. produces very costly and attractive sports watches. At the same time, Sofex Inc. introduced a stylish sports watch in the market. The watches of Timex Design Inc.and Sofex Inc. are considered to be perfect substitutes. The cross elasticity of demand between these watches is .

A. infinity

B. positive, less than infinity

C. zero

D. one

Question 35

The concept employed to define surplus maximization in Marx's analysis through cither increasing the number of units of labour employed or by extending the working day is referred to as "

A. Relative Surplus

B. Labour Time Surplus

C. Quantitative Surplus

D. Absolute Surplus

Question 36

If the exchange rate changes from 80 rupees per dollar to 100 rupees per dollar

A. the dollar has depreciated

B. the dollar has appreciated

C. the rupee has appreciated

D. no change in the value of dollar

For the next TWO (37 and 38) questions consider the following sYstem of equations:

$$2x_1 - x_2 + 3x_3 = 5; \text{ and } -x_1 + 2x_2 - 2x_3 = 0$$

Question 37

What is the number of basic solutions for the above system of equations?

A. 3

B. 2

C. 0

D. 1

Question 38

How many total number of solutions does this system of equations have?

A. No solution;

B. One unique solution;

C. Three solutions;

D. Infinitely many solutions

Question 39

The offer curves introduced by Alfred Marshall, helps us to understand how the is established in international trade.

A. exchange rate

B. equilibrium price ratio

C. terms of trade

D. satisfaction level

Question 40

Share of workforce employed in Indian agriculture according to the Agricultural Census in - 2011 is about

A. 36 percent

B. 49 percent

C. 56 percent

D. 62 percent

Question 41

If the total revenue and total cost function is given by $R(q) = 10q - 0.01q^2$ and $C(q) = 100 + 5q$ Find the level of output that will maximize profit

A. $q = 500$

B. $q = 525$

C. $q = 1000$

D. $q = 250$

Question 42

Under competitive conditions a firm in the long run makes

A. normal profits

B. zero profits

C. negative profits

D. need more information

Question 43

A commodity for Marx represents which two kinds of values?

A. Surplus Value and Scarcity Value

B. Bourgeoisie Value and Proletariat Value

C. Use Value and (exchange) Value

D. Capital Value and Labour Value

Question 44

In India which of the following have highest share in disbursements of credit to agriculture and allied activities?

A. Commercial banks

B. Cooperative Banks

C. Regional Rural Banks

D. Microfinance Institutions

Question 45

In case of Cournot model of oligopoly

A. Price is equals to marginal cost

B. Price is greater than marginal cost

C. Price is less than marginal cost

D. Pricc is half of the marginal cost

Question 46

If any state in a country depends on disproportionately high level on indirect taxes, on the normative basis such tax system is

A. Progressive in nature

B. Ideal in nature

C. Regressive in nature

D. We cannot say anything

Question 47

How does Amartya Sen define poverty?

A. The necd to supplement luxuries for an individual

B. The lack of supportive social institutions to ensure one's basic livelihood.

C. The lack of material well-being

D. The deprivation of basic capabilities for an individual

Question 48

When a corporation issues a bond, it is

A. borrowing money and promising to pay the lender back

B. investing in another company

C. creating a new set of preferred stock

D. selling an ownership share in the company

Question 49

A society consists of four individuals with the following incomes $200, 220, 300$ and 320 . The poverty line is 250 . The poverty gap index is then,

A. 0.05

B. 0.08

C. 0.16

D. 20.0

Question 50

See the scatter-plot given below:

A. The two variables have a positive statistical relation

B. The two variables have no statistical relation

C. The variable Y is inversely proportional to X

D. The variable Y is directly proportional to X

Question 51

According to John Maynard Keynes, aggregate planned output in the short run is determined by _____

A. level of labour supply in the economy

B. stock of capital in the economy

C. technological efficiency

D. none of the above

Question 52

In the Solow model, if a country is in the steady state, an earthquake causes widespread destruction of the capital stock, and there is no change in the level of savings or depreciation, then this will result in which of the following?

A. The growth rate of output will increase, and the country will end up at the

B. The growth rate of output will drop, and the country will end up at a lower steady state.

C. The growth rate of output will increase, and the country will end up at a higher steady state.

D. The growth rate of output will increase, and the country will end up at a lower steady state.

Question 53

If gold becomes acceptable as a medium of exchange, the demand for gold will and the demand for bonds will , everything else held constant.

A. decrease; decrease

B. decrease; increase

C. increase; increase

D. increase; decrease

Question 54

MGNREGA is aimed at:

A. helping educated unemployed youth to establish self-employed units.

B. providing guaranteed wage employment of at least 100 days in a year to those households opting for it.

C. to provide employment to Widows.

D. providing guaranteed wage employment of unlimited days in a year.

Question 55

For the total cost function: $TC(q) = q^3 - 6q^2 + 14q + 75$, find the output at which point average variable cost is minimum.

A. $q = 3$

B. $q = 5$

C. $q = 4$

D. $q = 6$

Question 56

Which of the following is the most likely cause of Immiserizing growth?

A. When growth is concentrated in a country's import sector.

B. When growth is balanced across exports and imports.

C. When growth is concentrated in goods with high world demand clasticity.

D. When growth is concentrated in a country's export sector.

Question 57

Health insurance is

A. a risk sharing mechanism that lowers out-of-pocket health expenditure

B. Cost containing mechanism

C. Both the above

D. None of the above

Question 58

Terms of trade that relate to the real ratio of international exchange between commodities is called

A. Real cost terms of trade

B. Commodity terms of trade

C. Income terms of trade

D. Utility terms of trade

Question 59

Match LIST-1 I. Affine function II. Rectangular hyperbola III. Polynomial function IV. Exponential function V. Periodic function LIST-2 1. $y = 5^x$ 2. $y = -x^n + 2x^{n-1} + .. + 3x + c$ 3. $y = 3\sin(x - 4)$ 4. $y = -5x + 12$ 5. $y = -6/x$ Then $(I., II., III., IV., V.)$ match to

A. (4,5,2,1,3)

B. (5,4,2,3,1)

C. (1,3,4,2,5)

D. (4,2,5,1,3)

Question 60

Which of the following is a true statement?

A. The money supply is defined as only central bank notes.

B. The average price of goods and services in an economy is called the aggregate price level.

C. The inflation rate is measured as the rate of change in the government budget deficit.

D. The aggregate price level is measured as the rate of change in the inflation rate.

Question 61

Which of the following statements is false?

A. Foster-Greer-Thorbecke (FGT) index is scale invariant and but not translation invariant.

B. *F*GT index is decomposable.

C. Sen's index is translation invariant but not scale invariant.

D. Sen's index does take into account the income distribution of the poor

Question 62

A recession could result from a(n)

A. increase in aggregate demand

B. decrease in aggregate demand

C. increase in short-run aggregate supply

D. increase in long-run aggregate supply

Question 63

Irving R. Associates is granted a patent for a new product for which there are no close substitutes. Which of the following must be true at the profit -maximising quantity?

A. price is equal to marginal cost

B. average revenue is equal to marginal cost

C. marginal revenue is positive

D. marginal revenue is less than marginal cost.

Question 64

Five persons namely, Bhaskar, Mary, Apala, Nemichand and Shahid are to be seated on five seats in a row such that Shahid and Bhaskar must sit next to each other and Mary and Apala must sit next to each other. How many distinct arrangements are possible?

A. 24

B. 120

C. 36

D. 72

Question 65

The secular decline of terms of trade hypothesis in international trade is proposed by:

A. Gunnar Myrdal

B. Hans Singer- Raul Prebisch

C. Paul Samuelson

D. David Ricardo

Question 66

Which among the following statements is incorrect?

A. Index number is a relative measurement.

B. In fact, all index numbers are weighted.

C. Theoretically the best average in construction of index numbers is Geometric mean.

D. It is not possible to shift the base year for the price index.

Question 67

Consider the following statement in Economics: "When parties can bargain without any transaction cost, and to their mutual advantages, the resulting outcome will be efficient, regardless of how property rights specified". This statement is related to

A. Pigouvian tax of negative externality

B. Marginal social cost (MSC) in externality analysis

C. Coase Theorem

D. Market failure theory due to public goods

Question 68

In the IS-LM model, an increase in government spending in the goods market impacts the money market because it leads to

A. an increases in the money supply

B. an increase in income, which increases money demand

C. a decrease in income, which decreases money demand

D. an increase in interest rates, which increases money demand

Question 69

In a village of 100 households (HH), the mean HH income is 400 and variance of HH income is 25600 . The government decides to augment income of every HH by 100. Then the coefficient of variation (cv) of the HH income:

A. incrcases by 25%

B. increases by 20%

C. decreases by 20%

D. decreases by 25%

Question 70

The main difference between a tariff and a quota is

A. a quota reduces the quantity of imports more than a tariff.

B. a tariff raises the price of imports more than a quota.

C. a quota does not harm domestic consumers.

D. a tariff generates government revenue, while a quota, unless it is sold, does not.

Question 71

The Feldstein-Horioka Saving Investment Puzzle says the following:

A. countries with relatively low saving to income ratios have relatively high investment to incorne ratios. 2

B. there is no correlation between investment and saving in developed countries.

C. countries with a high ratio of saving to income have high ratios of investment to income.

D. Both A and B

Question 72

The banking system is called as fractional reserve banking

A. when the reserve deposit ratio is 100%

B. when the reserve deposit ratio is less than 100%

C. when bank reserves are equal to deposits

D. both A and B

Question 73

The total utility function $U(x_1, x_2) = x_1 x_2$ is maximized subject io the budget constraint $x_1 + x_2 = 6$ using the Lagrangian function method. Then at the equilibrium point, the marginal utility of money λ will be equal to -

A. 3

B. 6

C. 9

D. 1.5

Question 74

Comparison of GDP levels across countries are most accurate when:

A. the value of non-matket activities is the same across countries.

B. prices are the same across countries.

C. prices and the value of non-market activities are the same across countries.

D. prices for non-market activities arc the same across countries.

Question 75

Consider set X = {1/n | n is a natural number }. Then X is a

A. finite set

B. countable set

C. closed set

D. open set

Question 76

For the demand schedule to be downward-stoping, the following is true:

A. income effect dominates substitution effect

B. substitution effect is zero

C. substitution effect dominates income effect

D. income effect is zero

Question 77

Which of the following production functions exhibits decreasing returns to scale?

A. $Q = L^{2/3} \cdot K^{2/3}$

B. $Q = L^{2/3} + K^{2/3}$

C. $Q = 2/3L + 2/3K$

D. $Q = \min\{2/3L, 2/3K\}$

Question 78

An estimator that contains all information about parameter available in the sample is said to be:

A. Sufficient estimator

B. Efficient estimator

C. Consistent estimator

D. Unbiased estimator

Question 79

An excise tax levied on each unit of X good consumed

A. would reduce consumption of X and lower total expenditure on X.

B. would rotate the budget line outward along the X axis and allow the consumer to reach a higher indifference curve.

C. would place a consumer on a lower indifference curve

D. cause the consumer to reduce consumption of tax goods and the non-tax good equally.

Question 80

If the Reserve Bank of India increases the money supply, you would expect to see income _____and interest rates _____

A. changes be indeterminate; fall

B. fall; fall

C. rise; fall

D. rise; changes be indeterminate

Question 81

Marginal cost of a pure public good is

A. One

B. Zero

C. Very High

D. Two

Question 82

Given $Q = 100K^{0.5}L^{0.5}$, w (price of labour) = 30, and r (price of capital) = 40. What is the capital (K) Labour (L) ratio the firm should use in order to minimize the cost of producing 1444 units of output?

A. 1

B. 4/3

C. 3/4

D. Insufficient Information

Question 83

The third category of wages employed by the Classical economists apart from the concepts of Natural Wage and Market Wage is:

A. Minimum Wage

B. Equity Wage

C. Subsistence Wage

D. Unemployment Wage

Question 84

In the long-run competitive equilibrium, return to capital is called

A. Rate of profit

B. Supernormal profit

C. Money rate of interest

D. Real rate of interest

Question 85

An economy grows by 20% and −20% in two successive years. Then CAGR (compound annual growth rate) over this period of two years is approximately:

A. Zero

B. +2%

C. −2%

D. −4%

Question 86

Total revenue (TR) and total cost (TC) functions of a simple monopolist are assumed to be TR = $100q - 3q^2$ and TC = $4q^2 + 10q$ respectively. At what level of output q, the total profit of the monopolist will be maximum?

A. 6.4

B. 289

C. 14

D. 100

Question 87

When IS curve is vertical in the economy, the model predicts that:

A. Fiscal policy is more effective

B. Monetary policy is more effective

C. Fiscal policy is less effective

D. No policy is effective

Question 88

The Utility Function: $U(x, y) = \sqrt{x^2 + y^2}$ is

A. Homothetic and the Indifference Curve is Convex

B. Homothetic and the Indifference Curve is Concave

C. Nonhomothetic and the Indifference Curve is Convex

D. Nonhomothetic and the Indifference Curve is Concave

Question 89

In short run, fluctuations in GDP are the result of shifts in:

A. technology

B. aggregate Supply

C. aggregate Demand

D. capital Stock

Question 90

The correlation coefficient between two variables X and Y is found to be 0.4. What is the correlation between 2x and (−y)?

A. 2

B. −2

C. 0.4

D. -0.4

Question 91

A consumer's utility function is given by $U(x, y) = xy$, with a budgetary constraint $5x + 10y = 100$ Find the value of x and y that maximizes this utility function.

A. $x = 5$ and $y = 5$

B. $x = 10$ and $y = 5$

C. $x = 5$ and $y = 10$

D. $x = 1/10$ and $y = 1/5$

Question 92

The demand function a firm is facing is $q = 40p - 6p^2$. If the Point elasticity of demand is $e_d = -\frac{1}{2}$, What is the price at that point of production?

A. $p = 12$

B. $p = 6$

C. $p = 4$

D. $p = 32$

Question 93

To sell commodities at their cost of production in competitive markets and yet be able to make a surphus over and above cost of production as a contradiction in the general formula of capital has been identified by which of the following scholars?

A. David Ricardo

B. Thomas Piketty

C. Joseph Stiglitz

D. Karl Marx

Question 94

Given the required reserve ratio at 20 percent and total reserves at INR 20 billion, the maximum amount of deposits would be

A. INR 100 billion

B. INR 40 billion

C. INR 4 billion.

D. INR 60 billion

Question 95

Given the following data what should be the money growth under monetary targeting? Data: Income elasticity of money demand , expected real GDP growth 6 %, Inflation rate 4%

A. 11%

B. 15%

C. 10%

D. 12%

Question 96

Which of the following happens when the demand curve is perfectly inelastic and the government imposes a tax?

A. the whole tax is borne by the producers

B. the whole tax is borne by the consumers

C. the tax is borne partially by the producers and partially by the consumers

D. no change in the tax burden of the consumers

Question 97

The impact of economic development on population is best documented by

A. Malthusian theory

B. Optimum population theory

C. Demographic Transition

D. Lewis theory

Question 98

Forward exchange rates are useful for those who wish to

A. protect themselves from the risk that the exchange rate will change before a transaction is completed.

B. gamble that a currency will rise in value.

C. gamble that a currency will fall in value.

D. all of the above.

Question 99

The rate of inflation increases when _____

A. the unemployment rate equals the NAIRU.

B. the unemployment rate exceeds the NAIRU.

C. the unemployment rate is less than the NAIRU.

D. the unemployment rate increases faster than the NAIRU increases.

Question 100

Assume that, over a given period, the value of transactions in rupees is 10,000 and the money stock is 5,000 . What is the transaction velocity of money?

A. 2.5

B. 2

C. 0.5

D. 3

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Question 1

If the inverse supply and inverse demand functions of a commodity X are given by $P_s = 8+4X$ and $P_d = 20-5X$ respectively, and if price P and quantity X are determined at the equality of total demand and total supply, then the total surplus = consumer's surplis + producer's surplus is equal to

A. approximately 4 units.

B. 8 units.

C. 18 units.

D. 72 units.

Question 2

If we have the Leontief production function $y = \min\{ax1, b \times 2\}$ with two inputs $x1$ and $x2$, the associated total cost function will be of the

A. Lcontief function form.

B. Cobb-Douglas function form.

C. linear form.

D. non-linear form.

Question 3

In a simple Keynesian madel of a closed economy, the marginal propensity to consume (MPC) is 0.8. If an income tax at 25% of income is introduced than the simple Keynesian expenditure multiplier changes by:

A. +25%

B. 25%

C. +50%

D. −50%

Question 4

Euler's product exhaustion theorem presumes

A. Increasing retums to scale

B. Constant returns to scale

C. Decreasing returns to scale

D. No stipulation on returns to scale

Question 5

Arrange the following in the increasing order of income elasticity of demand (e e_2): I. Luxuries II. Inferior goods III. Necessities

A. III - II- I

B. II-I-III

C. I – II – III

D. II III-I

Question 6

If the current rate of interest changes from 5% to 4%, the market value of a pre-existing bond changes by:

A. +20%

B. +25%

C. −20%

D. −25%

Question 7

Reservation Price is

A. Maximum price that is fixed by the producer

B. Maximum price that a customer is willing to pay for a good

C. Minimum price that a customer is willing to pay for a good

D. Minimum Price that is fixed by the producer

Question 8

For a commodity, its demand schedule shifis to the left and its supply schedule also shifts to the lent. How do equilibrium price and quantity change?

A. Price and quantity both remain the same, i.e. no change.

B. Impact on price is ambiguous but quantity becomes higher after the shift.

C. Price goes down and impact on quantity is ambiguous.

D. Impact on price is ambiguous but quantity becomes lower after the shift.

Question 9

If cquilibrium price is below price ceiling fixed by the government, then

A. price ceiling is not binding

B. price ceiling is binding

C. need more information

D. there would be shortages at the price fixed by government

Question 10

Supposc the government proposes a luxury tax on private jets. The demand for private jets is elastic and the supply is inelastic, at least in the short run. The tax burden will fall on:

A. demanders

B. supplier

C. government

D. need more information

Question 11

If the savings rate in an economy is 36% and the incremental output ratio is 4 then the growth rate of the economy will be

A. 10%

B. 9%

C. 5.5%

D. 9.5%

Question 12

Which of the following is NOT a theory of term structure of interest rate?

A. Expectations theory

B. Quantity theory of money

C. Segmented markets theory

D. Liquidity premium theory

Question 13

The movement to free international trade is most likely to generate short-term unemployment in which industries?

A. Industries in which there are neither imports nor exports

B. Import-competing industries.

C. Industrics that sell to domestic and foreign buyers

D. Industries that sell to only foreign buyers

Question 14

According to the Heckscher-Ohlin model, the source of comparative advantage is a cotintry's:

A. technology

B. advertising

C. factor endowments

D. entrepreneurship

Question 15

Uncler perfect capital mobility and fixed exchange rate

A. monetary policy is highly effective

B. monetary policy is effective to some extent

C. monetary policy completely looses its effectiveness

D. NONE OF THE ABOVE

Question 16

A bag contains 4 black and 3 white identical balls. Two balls are drawn in succession at random without replacement. Consider the following events: Event A is that both the balls are black; event B is that both the balls are white; event C is that the first ball is black and the second ball is white. Consider statements about probabilities of occurrence of A, B, and C : [. P[C] = P[A] > P[B] II. P[A] = P[B] III. P[A] = P[C] TV. P[B] = P[C]

A. I and III are truc

B. II and TV are truc

C. III and IV are true

D. II, III and IV are true

Question 17

Consider an economy with 2 -goods. The set of all possible positive relative prices is given as: $p' = \{(p_t, p_2) \mid p_t, p_2 > 0, \text{ and } p_1 + p_2 = 1\}$. Identify the correct statements about the properties of set P : I. P is convex. II. P is bounded. III. P is closed. IV. P is compact. V. P is empty.

A. III only is true

B. III and IV are true

C. I and II are truc

D. V only is true.

Question 18

$f(x) = \log\left(x^2 - 3\right), x > \sqrt{3}$. Then, $f(x) = 0$, when, I. $x = -\sqrt{3}$; II. $x = +2$; III. $x = +\sqrt{3}$; IV. $x = -2$.

A. I and III

B. III

C. II and IV

D. II

Question 19

The domain of the real valued function f(x) = $\sqrt{2x+4}$ is the interval

A. $[2, \infty)$

B. $[-2, \infty)$

C. $[0, \infty)$

D. Is not defined

Question 20

Which one of these statistics is unaffected by outliers?

A. Mean

B. Standard deviation

C. Range

D. Interquartile range

Question 21

A result is called "statistically significant" whenever

A. The null hypothesis is true

B. The p-value is less than or equal to the significance level

C. The alternative hypothesis is true

D. The p-value is larger than the significance level

Question 22

The GDP deflator is a Price Index that measures

A. The price level of a basket of consumer goods and services included in GDP

B. The value of an economy's final output measured at current market prices

C. The overall price level of goods and services included in GDP

D. The economy's final output valued in terms of prices in a base year

Question 23

The Phillips curve provides a theoretical link between

A. the liquidity preference and investment demand schcdules.

B. the goods market and productivity.

C. the goods market and the labour market.

D. inflation and the demand for money

Question 24

According to the Neoclassical growth theory, sustained growth can only be explained by

A. growth in physical capital.

B. growth in the labour force.

C. balanced growth of labour and capital.

D. exogenous technological change

Question 25

Consider the following statements:

(i) Todaro model explains rural to urban migration.

(ii) Joan Robinson model of growth has the concept of 'Golden age growth path'.

(iii) Actual and warranted growth rates are found in the Harrod model of growth.

(iv) Solow model of economic growth explains the knife-edge equilibrium point.

Then, which of the above statement(s) is/are correct? Choose your option:

A. Only (i) is correct

B. Only (iv) is correct

C. Only (ii), (iii) and (iv) are correct

D. Only (i), (ii) and (iii) are correct

Question 26

In a college, 25% of the students failed in Economics, 15% of the students failed in English and 10% of the students failed in both Economics and English. A student is selected at random. If he failed in English, what is the probability that he failed in Economics?

A. 2/5

B. 2/3

C. 3/10

D. 2/10

Question 27

If the first quartile is 142 and the semi-interquartile range is 18 , what is the value of median assuming that the distribution is symmetrical?

A. 140

B. 150

C. 160

D. 170

Question 28

According to the advance estimates given in the Economic Survey 2020 – 21, India, the real Gross National Income for the year 2020 – 21 is projected

A. to contract by 4.2 percent.

B. to grow by 7.9 percent.

C. to contract by 7.9 percent.

D. to grow by 10.4 percent.

Question 29

According to the Mahatma Gandhi National Rural Employment Guarantee Act 2005

A. Every rural labourer is entitled for 100 days of employment

B. Every applicant to which employment is not shown in 15 days, is entitled for unemployment allowance

C. Every worker under the Act should be paid at least market wage

D. Every worker should be paid wages in kind

Question 30

PM CARES fund is created by Government of India with an objective to fight:

A. Poverty

B. Comuption

C. Black money

D. Covid 19

Question 31

Let V and W be ranciom variables such that the correlation between these two variables is positive but less than 1($0 < \text{Corr(V, W)} < 1$). Let X = 2(V − 4) and Y = −0.5 W + 2. Arrange the following in increasing order of magnitude of correlation:

I. Corr(X, W)

II. Corr (Y, V)

III. Corr (X,V)

IV. Corr (Y, W)

A. I-II-IV-III

B. II-I-III-IV

C. III-IV-I-II

D. IV-II-I-III

Question 32

Consider rolling of two fair dice (one White and one Blue), all outcomes being equally likely. Let n_I be number that came up on the White die and let n_2 be the number that came up on the Blue die. Define the random variables: $Y = (n_2 - n_1)\,; Z = (|n_2 - n_1|)$. Let μ_γ, μ_Z be means and σ_Y^2, σ_Z^2 be variances respectively of random variables Y and Z. Then,

A. $\mu_Y > \mu_Z$ and $\sigma_Y^2 > \sigma_Z^2$.

B. $\mu_Y > \mu_Z$ and $\sigma Y^2 < \sigma_Z^2$.

C. $\mu_Y < \mu_z$ and $\sigma Y^2 < \sigma_Z^2$.

D. $\mu_Y < \mu_Z$ and $\sigma_Y{}^2 > \sigma_Z{}^2$.

Question 33

Identify the correct statement about the function given below:

$$f(x) = \begin{matrix} x^2 & x \le 0 \\ 0, & 0 < x < 5 \\ (5-x)^2 & x \ge 5 \end{matrix}$$

A. The function is continuous as well as differentiable cverywhere.

B. The function is neither continuous everywhere nor differentiable everywhere.

C. The function is continuous everywhere but is not differentiable everywhere.

D. The function is not continuous everywhere but is differentiable everywhere.

Question 34

For an m by n matrix S having full column rank, $m > n$, let $X = S^{T}.S$; and $Y = S.S^{T}$. Then, which of the following are true?

I. X and Y are both of the same order.

II. X and Y are both of the same rank.

III. X and Y are both symmetric matrices.

IV. X and Y are both non-singular.

A. I and II are true

B. II and III are true

C. III and IV are true

D. 1 and IV are true

Question 35

Given $x = 2$ is a root of the equation: $x^3 - 3x - 2 = 0$, then the other two roots are:

A. $x = -1$, these two roots being identical real roots.

B. $x = +1$; and $x = -1$.

C. two complex roots.

D. $x = +l$; and $x = -2$.

Question 36

What is the difference, Erom a Marxian point of view, between the modes of exchange of 'Traditional Economic system' and 'Capitalist economic system'?

A. The transmission process noted as C-M-C in the traditional economy and as $M - C$ - M in the capitalist economy

B. The transmission process noted as C-M-C in the traditional economy and as $M - C$ - M in the capitalist economy

C. The transmission process noted as C-M-C' in the traditional economy and as M-C- M' in the capitalist economy

D. The transmission process noted as C-M'-C in the traditional economy and as M - $C' - M$ in the capitalist economy

Question 37

Which of the following best captures the basic idea of the Mercantilist school?

A. Accumulation of wealth in terms of bullion or precious metals

B. Generation of surplus

C. Growth of wealth in terms of output

D. Growth of productive labour

Question 38

The book, Asian Druma: An Inquiry into Poverty of Nations is authored by which of the following scholars?

A. Amartya Sen

B. Thomas Piketty

C. Gunnar Myrdal

D. Joseph Stiglitz

Question 39

According to W. W. Rostow, a sludent of underdeveloped areas is more likely to be concerned with the economics of which two stages of growth?

A. Economics of High Mass Production and Consumption stages

B. Economics of Take-off and High Mass Consumption Stages

C. Economics of Sustained Economic Growth and High Mass Consumption Stages

D. Economics of Preconditions and the Take-off Stages

Question 40

The Gross Fixed Capital Formation in India during 2012-21, according to the Economic Survey,

A. Has fallen from 34.31% to 27.59%

B. Has fallen from 27.59% to 21.34%

C. Has fallen from 21.34% to 17.8%

D. Increased from 21.34%1027.59%

Question 41

The argument that market failures may be an cndemic feature and therefore requires government intervention is due to

A. New classical macroeconomics

B. New Keynesian macroeconomics

C. Rational Expectations school

D. Milton Friedman

Question 42

De-industrialisation in colonial India stands for

A. Discouragement of modern industry

B. Acquisition of Indian companies by British companies

C. Exclusive focus on railways, banking and plantations

D. Destruction of traditional craft industries

Question 43

Political economy is primarily a study of

A. Socialism

B. Feudalism

C. Capitalism

D. Mercantilism

Question 44

Which among the following eminent Indian economists put forward the "drain of wealth theory" with respect to the British rule in India?

A. Dada Bhai Naoroji

B. Gopal Krishna Gokhale

C. Radhakamal Mukherjee

D. Mahader Govind Ranade

Question 45

Consider a society of a finite number of individuals $(1, 2, \ldots n)$ facing a finite number of states (i.e. alternatives), $Z_1, Z_2, \ldots Z_1 (t \geq 3)$. Every individual in this society is always able to unambiguously rank all these states with each other. We say that an alternatives Z_k is Pareto optimal, iff,

A. Every individual in the society considers Z_k to be superior to any other state

B. Every individual in the society considers Z_k to be at least as good as any other state

C. There is no other state which is considered at least as good as Z_k by everyone and strictly better than Z_k by at least one individual.

D. Every individual in the society considers Z_k to be at least as good as any other state and with respect to every other state, $Z_i (i \neq k)$, there is at least one individual who strictly prefers Z_k to this state Z_i.

Question 46

Prefercnces of an individual are represented by the utility function: $u(x, y) = 1000 \left(10 + (x - 15)^2 + (y$ $0, y \geq 0$. Then this utility function,

A. is strictly quasi-concave

B. satisfies non-satiation condition

C. is monotonous increasing

D. is continuous

Question 47

When firms get together and attempt to set prices and outputs so as to maximize total industry profits, they are known as a

A. Nash equilibrium collusion

B. model of price and output leadership

C. Cartel

D. Stackelberg model

Question 48

A person purchased 8 units of sugar when his income was Rs. 2000. As his income has risen to Rs 2500 , he has purchased 12 units of sugar. Then, the income elasticity of demand will be

A. 8

B. 2

C. 5

D. 20

Question 49

Given the matrix $E = \begin{bmatrix} 2 & 5 & 1 \end{bmatrix}$, let matrix $B = \underline{E^T E}$. The determinant value of B is

A. Zero

B. 8

C. 30

D. 16

Question 50

Based on the following paragraph, answer the question that follows it.

"In this model, one person, M, wants to induce another person, N to take some action which is costly to N. It is given that M may be unable to directly observe the action of N, but instead observes some output, x, that is determined, at least in part, by actions of N. "

Which of the following statements best describes the model given in the paragraph above?

A. M is the worker and N is the manager

B. M is the principal and N is the agent

C. It is a price leadership problem where M is the price leader and N is a follower.

D. It is a resource allocation model where M is the government and N is the family.

Question 51

An increase in money supply and a drop in the consumer confidence will lead to

A. A decrease in output and an increase in the interest rate.

B. An increase in output and a decrease in the interest rate.

C. An ambiguous effect on output and a decrease in the interest rate.

D. An ambiguous effect on output and an increase in the intercst rate.

Question 52

The investment trap is a situation whcre investment demand is

A. Perfectly interest inelastic

B. Perfectly interest elastic

C. Highly interest elastic

D. Unitary interest clastic

Question 53

The market demand curve for a public good

A. Is the horizontal sum of all individual demand curves

B. Is the vertical sum of all individual demand curves

C. Is upward sloping

D. Is always horizontal

Question 54

Given r = domestic interest rate, r^* = foreign interest rate, d = forward discount on the home currency, which of the following expression represents the Covered Interest Parity?

A. $r = r^*$

B. $r = r^* + \mathrm{d}$

C. $r = (r^* + d)^2$

D. $r = r^*/d$

Question 55

Assume B is social benefit, C is social cost, r is the social discount rate, t is the time and T is the life of an investment project. The Net Present Value (NPV) of this project is:

A. NPV $= \sum_{t=0}^{T} \frac{B_t - C_t}{(1+r)^t}$

B. NPV $= \sum_{t=0}^{T} \frac{C_t - B_t}{(1+r)^t}$

C. NPV $= \sum_{t=0}^{T} \frac{(1+r)^t}{B_t - C_t}$

D. NPV $= \sum_{t=0}^{T} \frac{B_t - C_t}{(C_t)^t}$

Question 56

The policy corridor in monetary policy conducted by the RBI in present day consists of the following

A. Repo rate and bank rate

B. Repo and reverse repo rate

C. Repo rate, reverse repo rate, and Marginal standing facility

D. repo rate and call moncy rate

Question 57

Which of the following is true, if the Tobin's q is greater than one?

A. It is profitable for firms to create additional capital.

B. Investment in the economy falls.

C. For firms, the value of additional capital falls short of acquiring it.

D. Expansionary monetary policy is ineffective.

Question 58

If a project costs Rs. 100 at $t = 0$, yields Rs.60 at t = 1, and Rs.80at$t = 2$, and the compound rate of interest is 10% per period, then the NPV equals

A. 20.7

B. 25

C. 10

D. 10.7

Question 59

The "iron law of wages" is

A. The wage-fund theory

B. The marginal productivity theory of wages

C. Collective bargaining

D. The subsistence theory of wages

Question 60

Malthusian theory of population explored the relationship between:

A. food supply growth and population growth

B. food supply growth and technology

C. population growth and development

D. optimum growth and resources

Question 61

Arrange the following commodities according their all India production in million tonnes in recent ycars (say, in years 2017-18 onwards) from highest production to the lowest: I. Wheat: II. Rice; III. Potato: IV. Milk.

A. II –1 – IV – III

B. IV-II - I - III

C. II –III – I – IV

D. I – 11 – IV – III

Question 62

Due to a negative shock in the exlernal sector, the demand forecast has become more pessimistic. How does this influence the marginal efficiency of capital (MEC) ?

A. No change in MEC

B. An increase in MEC

C. A decrease in MEC

D. Cannot say due to insufficient information

Question 63

Leontief's results were considered paradoxical because the United States of America was believed to be

A. technologically efficient relative to the rest of the world

B. capital abundant relative to the rest of the world

C. labour abundant relative to the rest of the world

D. all of the above

Question 64

Nontariff trade barriers could include all of the following except

A. domestic content laws

B. government procurement policies

C. health, safety, and cnvironmental standards

D. antidumping/countervailing duties applied to imports

Question 65

Import substitution is an example of

A. the principle of comparative advantage

B. the principle of absolute advantage

C. an outward-looking growth strategy

D. an inward-looking growth strategy.

Question 66

The NAFTA is a:

A. monetary union

B. free trade area

C. common market

D. customs union

Question 67

The current account includes

A. the value of trade in merchandise

B. services

C. unilateral transfers

D. all of the above

Question 68

If a Carmer sells wheat to the miller for Rs. 500 and the miller sells flour to the baker for Rs. 700 and finally, the baker sells bread to the consumer for Rs. 1000 , then total value added by miller and baker is:

A. Rs. 500

B. Rs. 300

C. Rs. 1700

D. Rs. 1200

Question 69

The crawling peg is

A. An automatic system for revising the exchange rate

B. Relatively long periods of constant rates punctuated by sharp devaluations

C. When the Central Bank uses quantitative measures to adjust exchange rates

D. When the Central Bank uses qualitative measures to adjust exchange rates

Question 70

Which of the following tax has 'announcement effect'?

A. Income Tax

B. Property Tax

C. Excise Duty

D. Capital Gains Tax

Question 71

Efficiency requires that the production of pure public goods be undertaken to the point where,

A. The sum of marginal private benefits is equal to the marginal social cost of production.

B. The marginal private benefit is equal to the marginal social cost of production.

C. The marginal social cost exceeds the sum of the marginal private benefits.

D. None of the above

Question 72

The equilibrium level of output and price

A. in monopoly is greater than that in perfectly competitive market

B. is less in monopoly when compared to perfectly competitive market

C. equilibrium output is lower and price higher in monopoly when compared to perfectly competitive market

D. equilibrium output is higher and price lower in monopoly when compared to perfectly competitive market

Question 73

Degree of monopoly power, L, is given by

A. $L = (P - MC)/P$

B. $L = (MC - P)P$

C. L = (P − MC)/MC

D. $L = (P - MC)^2$/P

Question 74

Consider a duopoly with the following market demand function: $P = 30 - Q$. Each firm is having a zero marginal cost. Then, in the Coumot cquilibrium, the firm outputs and the market price are:

A. output produced 10 by each firm and P is 10

B. output produced 9 by each firm and P is 12

C. output produced 11 by each firm and P is 8

D. output produced 12 by hoth firm and P is 6

Question 75

The demand and supply functions for a commodity are given by $p = 120 - 5q_d$ and $p = 24 + \frac{q_s}{3}$, where p is price, q_d is quantity demanded and q_s is quantity supplied. Find the equilibrium quantity and price.

A. $q = 18$ and $p = 5$

B. $q = \frac{5}{3}$ and $p = 30$

C. $q = 18$ and $p = 30$

D. $q = 120$ and $p = 24$

Question 76

If the demand function for the product of a firm is $p = \sqrt{1350 - 6q}$, find the output level that maximizes total revenue.

A. $q = 1350$

B. $q = 150$

C. $q = 225$

D. $q = 36.74$

Question 77

Suppose the demand functions for goods 1,2 , and 3 have the following functional forms, where Q denotes quantity demanded, P denotes price, and H denotes income: (i). $Q_1 = 120 - 3.5P_1 - 6P_2 + 14H$ (ii). $Q_2 = 100 - 2P_2 + 3P_3 + 1.1H$ (iii). $Q_3 = 1500 - 0.5P_3 - 30$H

Based on these demand functions, which of the following goods are known to be nomal goods?

A. (i), (ii) and (iii).

B. only (i)

C. only (iii).

D. (i) and (ii) only

Question 78

Which of the following economists proposed the idea of Balanced Growth in development theory?

A. Rosenstein Rodan

B. Ragnar Nurkse

C. Arthur Lewis

D. Harvey Liebenstein

Question 79

Amartya Sen argues in his work on Commodities and Capabilities that 'in judging the weli-being of the person, it would be premature to limit the analysis to the characteristics of goods possessed. We have to consider ... Choose the correct option.

A. 'Functionings' of Persons

B. 'Entitlements' of Persons

C. 'Endowments' of Persons

D. 'Lackings' of Persons

Question 80

According to Thomas Piketty, in the post-1970s and 80s the factor which to much greater extent determines who owns property, to what extent and who does not is:

A. Intellectual Property Rights;

B. Information Technology

C. Digital Money

D. Inheritance

Question 81

Given the function $W(x_1, x_2) = \log\left({x_1}^2 - {x_2}^2\right) - \log\left({x_1}^2 + {x_2}^2\right)$, the value of the function, $Y = x_1 W_1 + x_2 W_2$ (where, W_1 and W_2 are first order partial derivatives w.r.t. x_1 and x_2 respectively), is:

A. Zero

B. 25

C. +1 or −1

D. can not be determined

Question 82

If the utility function $U(x, y) = \sqrt{x^2 + y^2}$, for x and $y \geq 0$, then the indifference curves are

A. Convex

B. Concave

C. Quasi-concave

D. Not enough information

Question 83

For an industry with 11 firms, one with 50% market share and the other ten firms with 5% market share each, the Herfindahl index is equal to:

A. 2,750

B. 2,550

C. 650

D. 550

Question 84

A common fishing ground is:

A. Exclusive and Rival

B. Nonexclusive and Nonrival

C. Exclusive and Nonrival

D. Rival and Nonexclusive

Question 85

Chi-square test is used for

A. Association between attributes

B. Significance of correlation co-efficient

C. Slope of regression line

D. Equality between two means

Question 86

Estimator is defined as

A. Sampling mean of a distribution

B. A specific observed value

C. Sample statistic to estimate a population parameter

D. None of the above

Question 87

Bilateral Monopoly is

A. Market with only one seller and two buyers

B. Market with two buyers only

C. Market with one seller and one buyer

D. Market with two sellers only

Question 88

An increase in real interest rate causes desired investment to fall. Why?

A. The user cost increases which reduces desired capital stock

B. The tax-adjusted user cost increases, which increases desired capital stock

C. The user cost decreases which increases desired capital stock

D. The desired capital stock increases

Question 89

The differemce between the actual unemployncnt rate and the natural rate of unemployment is called

A. Structural Unemployment

B. Seasonal Unemployment

C. Frictional Unemployment

D. Cyclical Unemployment

Question 90

The type of monetary policy that is used in India, Now Zealand, and the United Kingdom is:

A. monetary targeting.

B. inflation targeting.

C. GDP growth targeting.

D. interest-rate targeting.

Question 91

Universal Basic Income Transfer, a conccpt much discussed in the literature, aims to rectify

A. Exclusion of precarious labour under unemployment

B. Exclusion of housewives, old people and differently-abled people from the market

C. Social exclusion of minorities

D. All of the above

Question 92

In fiscal year 2018 , the aggregate public health expenditure as percentage of GDP was:

A. 0.78 percent

B. 4.61 percent

C. 1.28 percent

D. 8.23 percent

Question 93

Suppose the probabilities of two independent events A and B are equal to 0.2 and 0.4. Then the conditional probability, $P(A \mid B)$ is:

A. 0.2

B. 0.5

C. 0.08

D. 0.02

Question 94

Consider two samples. Sample A has the following observations: $-6, -6, -1, 0, 1, 6, 6$; and sample B has the following observations: $521, 524, 526, 527, 528, 530, 533$. Then,

A. Range of A is greater than range of B

B. Variance of A is greater than variance of B

C. Range of A is smaller than range of B

D. Variance of A is smaller than variance of B

Question 95

Unemployment resulting from a mismatch of workers' skills and job requirements is called

A. frictional unemployment.

B. structural unemployment.

C. seasonal unemployment.

D. cyclical unemployment.

Question 96

If the aggregate price level at time t is denoted by CPI_t, the inflation rate from time $t-1$ to t is defined as:

A. $\pi_t = (\text{CPI}_t - \text{CP}_{t-1})/\text{CP}_{t-1}$.

B. $\pi_1 = (\text{CPI}_{1-1} - \text{CPI}_{L\cdot 1})/\text{CPI}_1$. .

C. $\pi_t = (\text{CPI}_{t+1} - \text{CPI}_t)/\text{CPI}_{t+1}$

D. $\pi_t = (\text{CPI}_l - \text{CPI}_{t-1})/\text{CPI}_t$.

Question 97

What is the interest rate at which the Reserve Bank of India lends money to commercial banks?

A. repo rate

B. reverse repo

C. call money rate

D. prime rate

Question 98

A rise in the price level causes the demand for money to and the interest rate to , everything else held constant.

A. decrease; decrease

B. decrease; increase

C. increase; decrease

D. increase; increase

Question 99

As per the India's union budget 2021-22, the Fiscal Deficit is estimated to be:

A. 7.4 percent of GDP

B. 8.5 percent of GDP

C. 9.1 pcrcent of GDP

D. 9.5 percent of GDP

Question 100

What is the disinvestment target for financial year 2021-22 for India?

A. 1.60LAKHCR

B. 1.70LAKHCR

C. 1.75LAKHCR

D. 2.00LAKHCR

SNU 2020

Question 1

Assuming an economy with representative agents, competitive factor markets, and a production function of $Y = AK^{\alpha}L^{1-\alpha}$, what is the wage paid to a unit labor?

A. $\left(\frac{Y}{AK^{\alpha}}\right)^{\frac{1}{1-\alpha}}$

B. $\alpha A \left(\frac{L}{K}\right)^{1-\alpha}$

C. $(1-\alpha)A \left(\frac{L}{K}\right)^{\alpha}$

D. $A \left(\frac{L}{K}\right)^{\alpha}$

Question 2

We denote as R^{in}, the relative return on assets held in Indian rupees compared to assets denominated in US dollars. Call the prevailing interest rates in the two countries i_{in} and i_{us}. The expected annual change in the rupee-dollar exchange rate is e. Assuming complete mobility of financial capital between the two countries, an expected 3% decline of rupee, and $i_{us} = 4\%$, what would the prevailing interest rate in India be

A. $i_{in} = 7\%$

B. $i_{in} = 1\%$

C. $i_{\text{in}} = -1\%$

D. $i_{\text{in}} = 4\%$

Question 3

$f : [1, 0] \to [1, 0]$ is continuous. Then it is true that

A. $f(0) = 0, f(1) = 1$

B. f is differential only at $x = 1/2$

C. $f'(x)$ is continuous for all $x \in (0, 1)$

D. $f(x) = x$ for at least one $x \in [0, 1]$

Question 4

Consider an inferior good. The price of this good decreases while the price of all other goods remain the same. Which of the following is correct?

A. The Hicksian compensated demand curve never lies to the right of the Slutsky compensated demand curve.

B. The Hicksian compensated demand curve never lies to the left of the Slutsky compensated demand curve.

C. The Hicksian compensated demand curve coincides with Slutsky compensated demand curve.

D. The question lacks sufficient information to infer the position of the Hicksian compensated demand curve vis-a-vis the Slutsky compensated demand curve.

Question 5

Consider a two good utility maximization where the utility function is additive separable, and takes the specific form: $U = x_2 + \ln x_1$. The prices of two goods x_1 and x_2, and money income are given by p_1 and p_2, and M respectively. Then, the amount of x_2 consumed in equilibrium, given by the demand function $x_2\left(p_1, p_2, M\right)$ is:

A. a linear function of price of good 1 .

B. positively related to price of good 1

C. independent of price of good 1 .

D. none of the above

Question 6

Consider a situation where the price of exactly one good changes (for example, due to a tax or a subsidy). All other relevant factors remain the same. The compensating variation measures how much extra money the government would have to give a consumer if it wanted to exactly compensate the consumer for the price change. The equivalent variation measures the maximum amount of income that the consumer would be willing to pay to avoid the price change. In this context, which of the following is correct?

A. The absolute magnitude of compensating variation cannot be greater than the absolute magnitude of equivalent variation.

B. The absolute magnitude of compensating variation cannot be lower than the absolute magnitude of equivalent variation.

C. The absolute magnitude of compensating variation and equivalent variation depends only on whether the price of the good has increased or decreased.

D. None of the above three options are correct.

Question 7

Consider a the preference ordering of a drunkard. He always prefers the consumption bundle with more alcohol regardless of the amount of the other commodity. The other commodity only matters when there is a tie in the amount of the alcohol between two bundles. We define the preference ordering more explicitly as follows. Say commodity 1 is alcohol and commodity 2 is other good. The drunkard ranks two bundles $X = (x_1, x_2)$ and $Y = \left(y_1, y_1\right)$ in the following way: X is preferred to Y if and only if $(i) x_1 > y_1$ or $(ii) x_2 > y_2$ when $x_1 = y_1$. Suppose the price of the commodity 1 and commodity 2 are INR 4 and INR 1 per unit respectively and income is INR 100 . If drunkard's income increases to INR 150 , then the optimal consumption for commodity 2

A. will increase by 10 units

B. will remain same

C. will decrease by 10 units

D. will increase by 2 units

Question 8

In a school, 60% of pupils have access to the internet at home. A group of 8 students is chosen at random. Find the probability that: At least 6 students have access to the internet.

A. 0.382
B. 0.315
C. 0.412
D. 0.345

Question 9

In a school, 60% of pupils have access to the internet at home. A group of 8 students is chosen at random. Find the probability that: Exactly 5 students have access to the internet.

A. 0.210
B. 0.279
C. 0.350
D. 0.345

Question 10

How many roots does the following equation have between 3 and 5? (Note $e \approx 2.718$)

$$(x-2)^2 + e^x = 7$$

A. 0
B. 1
C. 2
D. none of the above

Question 11

Consider the following two arguments: Argument I: Some Spanish speakers are Europeans. All Argentinians speak Spanish. Therefore, some Argentinians are Europeans. Argument II: No Argentinian is a European. Some people who speak Spanish are Europeans. Therefore, some people who speak Spanish are not Argentinians.

A. Argument I is valid and Argument II is invalid.
B. Argument I is invalid and Argument II is valid.
C. Both arguments are invalid.
D. none of the arguments are invalid.

Question 12

Define the total money supply (M) as the product of the monetary base (MB) and the money multiplier (m). The money supply has two components, currency in circulation (c), and the demand deposits in banking system (D). The monetary base is composed of currency plus reserves held in the banking system. Express the reserve ratio as r, and the ratio of currency to deposits as k. What is the expression for money multiplier?

A. $m = (1 - r)D$

B. $m = 1 + \frac{1-r}{k}$

C. $m = 1 + \frac{k}{r}$

D. $m = \frac{k+1}{k+r}$

Question 13

The quantity theory of money ($MV = PY$) describes a relationship between money supply, the velocity of money, the price level and the output. Assuming constant velocity, an inflation rate of 4%, and a GDP growth rate of 6%, what is the implied rate of growth of money supply? But if this was incorrect, and money growth was observed to be 3%, what does that imply about transaction velocity? 4

A. implied money growth is −2%, and that means velocity increased by 5%.

B. implied money growth is −2%, and that means velocity decreased by 5%.

C. implied money growth is 10%, and that means velocity increased by 7%.

D. implied money growth is 10%, and that means velocity decreased by 7%

Question 14

An opinion poll was conducted to gauge public opinion about a candidate running for an election. It asked two questions: (1) Do you support the candidate's position on taxes? and (2) Do you support the candidate's position on employment? A total of twelve hundred responses were received; six hundred said "yes" to the first question and four hundred said "yes" to the second. If three hundred respondents said "no" to the first question and "yes" to the second question, how many said "yes" to the first question, but said "no" to the second question?

A. 200

B. 500

C. 300

D. insufficient information

Question 15

The function $f : R \rightarrow R$ satisfies $F(x + y) = f(x) + f(y) \forall, y \in R$, where R is the real line, and $f(1) = 5$. Then $\Sigma_{i=1}^{n} f(i)$ is equal to

A. 5n/2

B. 5(n + 1)/2

C. 5n(n + 1)/2

D. 5n(n + 1)

Question 16

It is exactly 24 hours before Gibbard's Philosophy exam. He has an Economics exam directly after the Philosophy exam and has no time to study in between. Gibbard wants

to be a Philosopher, so he places more weight on his Philosophy test score. His utility function is given by:

$$u(p, e) = 0.6 \ln(p) + 0.4 \ln(e)$$

Where p is the score on Philosophy exam and e is the score on Economics exam. Although he cares more about Philosophy, he is better at Economics; for each hour spent studying economics he will increase his core by 3 points, but his philosophy score will only increase by 2 points for every hour spent studying philosophy. Studying zero hours results in a score of zero on both subjects (although ln(0) is not defined, assume her utility for a score of zero is negative infinity). So, how many hours should Gibbard optimally spend studying Philosophy?

A. 9.6

B. 14.4

C. 5

D. 10

Question 17

Consider the labour-leisure choices of a daily wage labourer whose utility function is given by: $u(c, l) = c - \frac{l^2}{2}$, where c represents consumption and l denotes the labour hours worked. Suppose that the only income she has is labour income and she works at an hourly wage of INR $w = 20$ per hour, and she get paid at the end of the day at each day for the hours worked. Denote the labour hours she chooses to supply in this situation as l^*. Suppose, a one-time lum-sum transfer of INR 1000 gets credited to her Jan-Dhan account. This question studies the effect of that cash transfer on her labour supply decision. In particular, after having that cash transfer,

A. she will work lesser hours than before.

B. she will work same hours as before.

C. she will work higher hours than before.

D. None of the above is true - the information is insufficient to find out the effects of transfer on labour supply. 0

Question 18

What is the solution to the following minimization problem,

$$\min_{x,y} \left(x^2 + 3y^2\right)$$
$$\text{s.t } x + y \leq 1, x \geq 0, y \geq 0$$

A. $x = 0, y = 1$

B. $x = 1, y = 1$

C. $x = \frac{3}{5}, y = \frac{2}{5}$

D. None of the above.

Question 19

Consider a two-good utility maximization problem, where the (Marshalian) demand

functions of the two goods denoted by x_1 and x_2 and the prices by p_1 and p_2 respectively. Assume, x_1 is a giffen good, i.e., $\frac{\partial x_1}{\partial p_1} > 0$. Let us denote the compensated demand functions (that minimises expenditure ensures minimum utility level) of good j by x_j^U. Then, $\frac{\partial x_2}{\partial p_2}$ (the cross price responsiveness for good 2) $\frac{\partial x_1}{\partial p_1}$ must have:

A. same signs

B. same values

C. opposite signs

D. None of the above.

Question 20

In how many ways can three persons, each throwing a single die once, make a score of 10 ?

A. 6

B. 8

C. 27

D. 36

Question 21

If the sum of two non-zero numbers is 100 , then what is the minimum of the sum of their reciprocals?

A. 3/25

B. 6/25

C. 1/25

D. None of the above.

Question 22

Matrix A, satisfies the property P if it satisfies Q, then which of the following statements is correct?

A. $P \Rightarrow Q$

B. $\neg P \Rightarrow \neg Q$

C. $\neg Q \Rightarrow \neg P$

D. None of the above

Question 23

Consider a three-sector closed economy with the following specifications:

$$Y = C + I + G$$
$$C = \bar{C} + cY_d$$
$$I = \bar{I} - br$$
$$G = \bar{G}, \quad T = \bar{T}$$

Where, Y is output, C is consumption expenditure, Y_d is disposable income, I is investment expenditure, $\bar{G}$ is autonomous government expenditure, $\bar{T}$ is autonomous tax and c is marginal propensity to consume. For this economy, the investment multiplier and tax multiplier are given by:

A. $\frac{1}{1-c}, \frac{-1}{1-c}$

B. $\frac{1}{1-c}, \frac{-c}{1-c}$

C. $\frac{1}{1-c}, \frac{c}{1-c}$

D. $\frac{1}{1-c}, \frac{1}{1-c}$

Question 24

Given below is the PMF of a discrete random variable X

$$P_x(k) = \begin{cases} 1/10 & , k = -2 \\ 1/5 & , k = -1 \\ 2/5 & , k = 0 \\ 1/5 & , k = 1 \\ 1/10 & , k = 2 \\ 0 & , \text{ otherwise} \end{cases}$$

If $Y = (X+1)^2$, then what is the range of Y?

A. $(1, 1, 4, 9)$

B. $(1, 3, 4, 9)$

C. $(0, 1, 4, 9)$

D. $(1, 3, 4, 12)$