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PUMDET 2024 Question Paper Applied Economics

EXAM	YEAR	TYPE
PUMDET	2024	Question Paper

PUMDET-2024

Subject : APPLIED ECONOMICS 4031100653

(Booklet Number)

Duration : **90** Minutes No. of Questions : **50** Full Marks : **100**

INSTRUCTIONS

1. All questions are of objective type having four answer options for each. Only one option is correct. Correct answer will carry full marks 2. In case of incorrect answer or any combination of more than one answer, ½ mark will be deducted.
2. Questions must be answered on OMR sheet by darkening the appropriate bubble marked A, B, C or D.
3. Use only **Black/Blue ink ball point pen** to mark the answer by complete filling up of the respective bubbles.
4. Mark the answers only in the space provided. Do not make any stray mark on the OMR Sheet.
5. Write question booklet number and your roll number carefully in the specified locations of the **OMR Sheet**. Also fill appropriate bubbles.
6. Write your name (in block letter), name of the examination centre and put your signature (as is appeared in Admit Card) in appropriate boxes in the OMR Sheet.
7. The OMR Sheet is liable to become invalid if there is any mistake in filling the correct bubbles for question booklet number/roll number or if there is any discrepancy in the name/signature of the candidate, name of the examination centre. The OMR Sheet may also become invalid due to folding or putting stray marks on it or any damage to it. The consequence of such invalidation due to incorrect marking or careless handling by the candidate will be sole responsibility of candidate.
8. Candidates are not allowed to carry any written or printed material, calculator, pen, docu- pen, log table, wristwatch, any communication device like mobile phones, bluetooth devices etc. inside the examination hall. Any candidate found with such prohibited items will be **reported against** and his/her candidature will be summarily cancelled.
9. Rough work must be done on the question booklet itself. Additional blank pages are given in the question booklet for rough work.
10. Hand over the OMR Sheet to the invigilator before leaving the Examination Hall.
11. Candidates are allowed to take the Question Booklet after examination is over.

Signature of the Candidate : _____
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Applied Economics

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SPACE FOR ROUGH WORK

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1. Which of the following axioms of preferences are essential to ensure that marginal utilities are positive ?

(A) transitivity (B) continuity

(C) monotonicity (D) concavity

2. Given the utility function $u(x, y) = \sqrt{xy}$ x and y are

(A) Net and Gross substitutes

(B) Net substitutes and gross complements

(C) Net substitutes but neither gross substitutes nor complements

(D) Net and gross complements

3. An individual's utility function is $U(x_1, x_2) = \log x_1 + \log x_2$. Her expenditure function is given as

(A) $\log \frac{m^2}{4P_1P_2}$ (B) $\log\left(\frac{m}{2P_1}\right) + \log\left(\frac{m}{2P_2}\right)$

(C) $2\sqrt{P_1P_2 \exp^{\overline{U}}}$ (D) $2\sqrt{P_1P_2m}$

4. In a competitive market, at equilibrium, the quantity and price are 15.75 and 5 respectively. Further, at equilibrium, elasticity of demand is 0.4 and elasticity of supply is 0.5. The market demand function and market supply function are

(A) $Q_S = 22 + 1.26\ P$ and $Q_D = 7.875 - 1.575\ P$

(B) $Q_S = 20 + 2.52\ P$ and $Q_D = 8.35 - 1.891\ P$

(C) $Q_D = 7.375 - 2.26\ P$ and $Q_S = 22.291 + 3.578\ P$

(D) $Q_D = 22 - 1.26\ P$ and $Q_S = 7.875 + 1.575\ P$

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5. The optimal two-part tariff charged by a monopolist practising second-degree price discrimination will be characterised by

(A) The same price and same entry fee charged to every customer.

(B) The same price but a different entry fee charged to every customer (differentiated by demand "type")

(C) A different price (differentiated by demand "type") but the same entry fee charged to every customer.

(D) A different price and a different entry fee charged to every customer (differentiated by demand "type")

6. Consider the following utility function : $U = A + Bx^2y^6$. Which of these is true of the equilibrium share of y in total expenditure ?

(A) 50% (B) 75%

(C) 100% (D) 25%

7. Ravi is given ₹ 100 to spend on two bads (goods associated with negative utility), A and B, each having a per unit price of ₹ 2. What is the equilibrium consumption of A and B ?

(A) (25, 25) (B) (0, 50)

(C) (0, 0) (D) (50, 0)

8. Which of the following statements is correct ?

(A) All Nash equilibria survive IESDS.

(B) Any strategy which survives IESDS will be a Nash equilibrium.

(C) In a game where there is a unique pure strategy Nash equilibrium, IESDS will also yield that unique equilibrium.

(D) Both (A) and (B) are true.

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9. A monopolist sells in two markets. The demand for the monopolist's product in market 1 is $x_1 = a_1 - b_1p_1$ and that in market 2 is $x_2 = a_2 - b_2p_2$. The monopolist has zero marginal cost. Under what condition will the monopolist decide not to price discriminate ?

(A) $a_1 = a_2$ (B) $b_1 = b_2$

(C) $a_1b_2 = a_2b_1$ (D) $a_1b_1 = a_2b_2$

10. Consider the following description of production technology of a firm :

$y = \min\{x_1, x_2\} + \min\{x_3, x_4\}$ where x_is are inputs. Suppose the input price vector is (4, 3, 2, 1). The cost minimizing demand for the inputs for $y = 1$ will be :

(A) $x_1 = 1, x_2 = 0, x_3 = 1, x_4 = 0$ (B) $x_1 = 1, x_2 = 1, x_3 = 1, x_4 = 1$

(C) $x_1 = 0, x_2 = 0, x_3 = 1, x_4 = 1$ (D) $x_1 = 0, x_2 = 1, x_3 = 1, x_4 = 1$

11. Consider a standard Cournot duopoly (complete information) : two firms simultaneously choose output levels to maximize their profits. The market inverse demand is $P = 1 - q_1 - q_2$ where q_i is firm i's output. Each firm incurs a fixed cost of $\frac{1}{8}$ if it produces positive output (otherwise, its costs are zero). Once the fixed cost is paid it costs each firm zero to produce each additional unit i.e. variable costs are zero. Find the pure strategy Nash equilibrium (or Equilibria) of this game.

(A) $\left\{q_1^* = \frac{1}{3}, q_2^* = 0\right\}$

(B) $\left\{q_1^* = \frac{1}{3}, q_2^* = \frac{1}{3}\right\}$

(C) Both $\left\{q_1^* = \frac{1}{2}, q_2^* = 0\right\}$ and $\left\{q_1^* = 0, q_2^* = \frac{1}{2}\right\}$

(D) $\left\{q_1^* = \frac{1}{2}, q_2^* = 0\right\}$ only

12. Supply of labour is given by $L^S = 10w$ and demand for labour is given by $L^D = 80 - 10w$. The government pays a subsidy of 1 per hour. The level of employment will be

(A) 55 (B) 45

(C) 65 (D) 50

13. A monopolist has two plants with marginal costs given by $MC_1 = 20 + 2Q_1$ and $MC_2 = 10 + 5Q_2$. The market demand curve is given by $P = 20 - 3Q$. Find the optimum allocation in the two plants.

(A) $Q_1 = 0.45 = Q_2$ (B) $Q_1 = 0.55; Q_2 = 0.4$

(C) $Q_1 = 0; Q_2 = 0.91$ (D) $Q_1 = 0.35; Q_2 = 0.06$

14. The Nash equilibrium in the following game :

	B_1	B_2	B_3	B_4
A_1	66, 90	68, 199	70, 198	73, 191
A_2	79, 201	82, 211	85, 214	89, 208
A_3	82, 212	86, 224	90, 229	95, 225
A_4	75, 223	80, 237	85, 244	91, 245

(A) A_1, B_4 (B) A_2, B_3

(C) A_4, B_2 (D) A_3, B_3

15. Suppose W_c, W_d and W_m represent the total welfare (Consumers' surplus + Producers' surplus) of a firm in perfectly competitive market, duopoly market and a perfectly discriminating monopoly market respectively. Then which of the following is true ?

(A) $W_c > W_d > W_m$ (B) $W_c < W_d < W_m$

(C) $W_c > W_d < W_m$ (D) $W_d < W_c = W_m$

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16. If a government increases its spending on domestically produced goods by an amount (G) which is financed by an equivalent increase in taxes (T), the aggregate demand will most likely

(A) decrease by the same amount as the increase in G and T.

(B) remain unchanged.

(C) increase by the same amount as the increase in G and T.

(D) increase by a loss amount as the increase in G and T.

17. Personal income of a country in a given period does not include

(A) Undistributed profit of the corporates.

(B) Transfer income received by the residents of a country from the government in the given year.

(C) Dividends paid by the corporates.

(D) All of the above

18. It does not matter if government spending is financed by current taxes or future taxes. Such proposition is explained by :

(A) The life cycle hypothesis (B) The Ricardian equivalence

(C) The permanent income hypothesis (D) The Ratchet effect

19. The 'Shoe leather' cost of inflation include all of the following except

(A) The cost of more frequent trips to the bank

(B) The lost purchasing power of cash

(C) The extra costs incurred to avoid holding cash

(D) Costs associated with having to hold small amounts of cash when there is high inflation.

20. Individual A buys a one year government bond on January 1, 2023 for $500. He receives principal plus interest totalling $545 on January 1, 2024. Suppose that the CPI is 200 on January 1, 2023 and 214 on January 2024. This increase in prices is more than individual A had anticipated; his guess was that CPI would be at 210 by the beginning of 2024. Then his expected real interest rate would be :

(A) 9%
(B) 5%
(C) 4%
(D) 2%

21. Suppose Japanese shareholders own 49% and Indian shareholders 51% of the shares of a firm producing automobiles in India. The profits earned by Japanese shareholders of the firm form

(A) Part of Indian GDP and part of Japanese GNP
(B) Part of Indian GDP and part of Indian GNP
(C) Part of Indian GNP and part of Japanese GNP
(D) None of the above

22. In the fixed price IS-LM model, which of the following is true if we compare the effects of an increase in government expenditure (X) with that of a reduction in money supply (Y) ?

(A) Both will result in an increase in output but while X will be accompanied by a rise in the interest rate Y will reduce the interest rate.
(B) X and Y will have opposite effects on output but the same effect on the interest rate
(C) X and Y will have the same effect on output but opposite effects on the interest rate
(D) X will have an adverse effect on output because it will raise the level of the fiscal deficit while Y will result in an increase in output by reducing the interest rate.

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23. Consider a Simple Keynesian Model for a closed economy with government. Suppose there does not exist any public sector enterprise in the economy. Income earners are divided into two groups, Group 1 and Group 2, such that the saving propensity of the former is less than that of the latter.

Aggregate planned investment is an increasing function of GDP (Y). Start with an initial equilibrium situation. Now, suppose the government imposes and collects additional taxes from group 1 and uses the tax revenue so generated to make transfer payments to Group 2. Following this :

(A) aggregate saving in the economy remains unchanged.

(B) aggregate saving in the economy declines.

(C) aggregate saving in the economy rises.

(D) aggregate saving in the economy may change either way.

24. Suppose the penalty imposed for premature withdrawal of a time deposit from any bank in an economy increase from 1% to 2.5% of the amount of the deposit. Everything else remaining constant, what will happen to the transactions demand for money in the economy ?

(A) Remain unchanged

(B) Increase

(C) Decrease

(D) Cannot be determined

25. Suppose the real wage in a country is at the equilibrium level, but there is some natural unemployment. Which of the following does not help to explain this natural unemployment ?

(A) At the equilibrium wage, some people will prefer to stay at home with their families than have paid employment.

(B) At the equilibrium wage, some people who recently returned to the labour force after caring for young children will be unemployed while they wait for what they feel is the right job.

(C) At the equilibrium wage, some people may be unemployed because the demand for their skills has fallen and there are no suitable jobs available.

(D) At the equilibrium wage, some new graduates will be unemployed while they wait for what they feel is the right job.

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26. Monetary policy is likely to be least responsive to domestic economic conditions if policy makers employ :

(A) inflation targeting
(B) interest rate targeting
(C) exchange rate targeting
(D) price targeting

27. In Solow model of growth or change in the savings ratio has a

(A) Level effect
(B) Growth effect
(C) Both level and growth effect
(D) None of the above

28. If the government of India prohibits the import of foreign car, which of the following is certainly true ?

(A) Real exchange rate depreciates
(B) Real exchange rate appreciates
(C) Net exports increase
(D) Net exports remain unchanged

29. The currency to deposit ratio in an economy is 0.2 and the reserve to deposit ratio is 0.1. The value of money multiplier is

(A) 0.25
(B) 0.33
(C) 3
(D) 4

30. Lucas critique entails that

(A) Usual policy analysis ignores the role of expectation.
(B) Devaluation does not raise export.
(C) Crowding out is a hypothetical situation.
(D) Tax revenue does not rise with an increase in tax rate.

31. If $P(A) = \frac{1}{12}$, $P(B) = \frac{5}{12}$ and $P(B / A) = \frac{1}{15}$, then $P(A \cup B)$ is equal to

(A) $\frac{89}{180}$
(B) $\frac{90}{180}$
(C) $\frac{91}{180}$
(D) $\frac{92}{180}$

32. The distribution of heights of American women aged 18 to 24 is approximately normally distributed with a mean of 65.5 inches and standard deviation of 2.5 inches. Calculate the z-score for a woman six feet tall.

(A) 1.04
(B) 1.33
(C) 2.6
(D) 4.11

33. A study was done to examine the effect of pollution on the health of workers in a steel factory. Data was collected on age, sex, educational qualification, hours of work per week, years of experience in the factory, number of days of medical leave taken in the last year. Which of these would you choose as the dependent variable ?

(A) Age
(B) Hours of work per week
(C) Years of experience in the factory
(D) Number of days of medical leave taken in the last year

34. A histogram showing the distribution of marks and obtained marks for 205 students is positively skewed. In this sample,

(A) the mean is equal to the median which is equal to the mode.
(B) the mean is greater than the median but less than the mode.
(C) the mean is less than both the median and the mode.
(D) the mean is greater than the median which is greater than the mode.

35. A researcher asked some residents of a locality how much they would be willing to pay for the renovation of a local park. This researcher was trying to estimate the valuation of the park using

(A) Hedonic price model
(B) Contingent valuation method
(C) Travel cost method
(D) Optimal valuation method

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36. Which of the following is a means of coping with air pollution emitted by a factory ?

(A) Emission subsidies
(B) Patents
(C) Consumption taxes
(D) Pigouvian taxes

37. X_1, X_2, X_3 and X_4 are independent standard normal variates. Let, $Y = (X_1 + X_2)^2 + (X_3 + X_4)^2$. Variance of Y is _____. Fill up the blanks.

(A) 30
(B) 31
(C) 32
(D) 33

38. Suppose $Y_t = \alpha + \beta_1 t + \sum_{i=1}^{4} \beta_i^* D_i + \varepsilon_i$. Y_t is a quarterly time series data on a company's profit. D_i is the quarterly dummy such that, $D_i = 1$ if the data point belongs to i^{th} Quarter i = 1, 2, 3 and 4

The linear regression output will be

(A) Unbiased, Efficient and Consistent
(B) Biased, but inefficient
(C) Biased, but inconsistent
(D) The regression output can not be obtained at all

39. Suppose $Y_t = Y_t - 1 + \varepsilon_t$, where $\varepsilon_t \sim (0, \sigma^2)$ then, this time series model is

(A) stationary
(B) non-stationary
(C) having structural break
(D) auto regressive process

40. Two independent random variables X and Y are binomial; $X \sim B\left(3, \frac{1}{3}\right)$ and $Y \sim B\left(5, \frac{1}{3}\right)$. Find $P(X + Y \geq 1)$.

(A) $\left(\frac{2}{3}\right)^8$

(B) $\left(\frac{1}{3}\right)^8$

(C) $1 - \left(\frac{1}{3}\right)^8$

(D) $1 - \left(\frac{2}{3}\right)^8$

41. A consignment of 15 record players contains 4 defectives. A record player is selected randomly one by one and examined. Those examined are not returned back. What is the probability that 9th one examined will be the last defective one ?

(A) $\frac{8}{195}$

(B) $\frac{11}{195}$

(C) $\frac{9}{195}$

(D) $\frac{13}{195}$

42. Consider a matrix $\begin{bmatrix} 2 & 2 \\ 2 & -1 \end{bmatrix}$ the characteristic vector of this matrix

(A) $\begin{bmatrix} \frac{2}{\sqrt{5}} \\ \frac{1}{\sqrt{5}} \end{bmatrix}$ and $\begin{bmatrix} \frac{-1}{\sqrt{5}} \\ \frac{2}{\sqrt{5}} \end{bmatrix}$

(B) $\begin{bmatrix} \frac{-2}{\sqrt{5}} \\ \frac{-1}{\sqrt{5}} \end{bmatrix}$ and $\begin{bmatrix} \frac{2}{\sqrt{5}} \\ \frac{1}{\sqrt{5}} \end{bmatrix}$

(C) $\begin{bmatrix} \frac{-1}{\sqrt{5}} \\ \frac{-2}{\sqrt{5}} \end{bmatrix}$ and $\begin{bmatrix} \frac{-2}{\sqrt{5}} \\ \frac{2}{\sqrt{5}} \end{bmatrix}$

(D) $\begin{bmatrix} \frac{1}{\sqrt{5}} \\ \frac{2}{\sqrt{5}} \end{bmatrix}$ and $\begin{bmatrix} \frac{-1}{\sqrt{5}} \\ \frac{-2}{\sqrt{5}} \end{bmatrix}$

43. Consider $y = \beta x + \varepsilon$ is a regression equation, but y has error such that $y = \tilde{y} + u$; $\tilde{y}$ is the true value. OLS in the regression equation will produced.

(A) biased estimator.

(B) unbiased estimator

(C) biased but efficient estimator.

(D) unbiased but inefficient estimator

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44. Suppose, in a linear regression, the error does not follow normal distribution, then choose the correct option.

(A) $\frac{\hat{\beta}}{SE(\hat{\beta})} \sim t_{n-2}$

(B) $\hat{\beta} \sim N(\beta, \text{var}(\beta))$

(C) $\frac{\hat{\beta}}{SE(\hat{\beta})}$ will not follow t-distribution

(D) $\hat{\beta} \sim$ uniform distribution

45. Suppose the true relationship between y_t and x_t is,

$$y_t = \beta_1 + \beta_2 x_t + \beta_3 y_{t-1} + u_t$$

but a researcher has used

$$y_t = \beta_1 + \beta_2 x_t + v_t$$

then the problems in estimation will be

(A) biased estimation

(B) biased estimation due to autocorrelated term in the error

(C) unbiased but inconsistent

(D) unbiased and consistent

46. Two person A and B, make an appointment to meet on a certain day at a certain place between 4 P.M. to 5 P.M. at random points of time. They agree to wait not more than 15 minutes. Each individual is equally independently likely to arrive at any time during the hour, the probability that they will meet is,

(A) $\frac{9}{16}$

(B) $\frac{1}{2}$

(C) $\frac{7}{16}$

(D) $\frac{11}{16}$

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47. The interaction dummy age*mar where $15 \leq age \leq 18$ and mar = 1 if married and 0 otherwise would

(A) Change the slope of the regression line

(B) Create separate regression lines for married and unmarried with the married having a different intercept

(C) Create separate regression lines for married and unmarried with the married having a different slope

(D) Create separate regression lines for married and unmarried with the married having a different slope and intercept

48. If the Residual Sum of Squares (RSS) in a regression analysis is 34 and the Explained Sum of Squares (ESS) is equal to 40, what is the value of coefficient of determination ?

(A) 0.46

(B) 0.74

(C) 0.54

(D) 0.85

49. A differentiable function of one variable, $f(x)$ is showing $f(v) \geq f(u)$ and $f'(u)(v - u) \geq 0$ at two distinct points u and v in the domain, then $f(x)$ is

(A) quasi concave

(B) quasi convex

(C) concave strictly

(D) convex strictly

50. To reach an economically efficient output level, the size of an excise tax imposed on a firm generating a negative externality should be

(A) Firm's Private Marginal Cost (PMC)

(B) Firm's Social Marginal Cost (SMC)

(C) Difference between PMC and SMC

(D) Sum of PMC and SMC

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