

PUMDET-2023

Subject : **APPLIED ECONOMICS**

(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, $\frac{1}{2}$ 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.
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 : _____
(as in Admit Card)

Signature of the Invigilator : _____



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SPACE FOR ROUGH WORK



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1. An entrepreneur has the short-run cost function

$$C = q^3 - 10q^2 + 17q + 66$$

If the market price is 5, the profit maximizing output is

- (A) 6 (B) 4
(C) 3 (D) 2
2. An increase in output due to an increase in demand in a perfectly competitive and constant cost industry which is in the long-run equilibrium, will result from:
- (A) New firms only (B) Existing firms only
(C) Both new and existing firms (D) Any of the above
3. The market demand and the cost functions in a duopoly market are $q = (100 - P) \times 2$, $C_1 = 5q_1$ and $C_2 = 0.5q_2^2$. The Stacklberg solution for q_1 when firm 1 is the leader is given by
- (A) $q_1 = 93\frac{1}{3}$ (B) $q_1 = 90\frac{1}{3}$
(C) $q_1 = 89$ (D) $q_1 = 95$
4. A demand function is given as $X_1 = Ap_1^\alpha p_2^\beta M^\gamma$, where p_1 and p_2 are prices and M is money income. The relation between α , β and γ is
- (A) $\alpha + \beta + \gamma = 1$ (B) $\alpha + \beta + \gamma > 0$
(C) $\alpha + \beta + \gamma < 0$ (D) $\alpha + \beta + \gamma = 0$
5. When two firms are engaged in (Bertrand) price competition (with equal unit costs)
- (A) their outputs will be lower and prices higher than if they engaged in (Cournot) quantity competition.
(B) their outputs will be higher and prices lower than if they engaged in (Cournot) quantity competition.
(C) their outputs will be higher than Cournot quantity competition but nothing can be said about price.
(D) their price will be lower than Cournot quantity competition but nothing can be said about outputs.



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10. Consider the following two utility functions :

- (i) $u(x, y) = xy$
- (ii) $v(x, y) = x^2y^2 + \ln(x) + \ln(y)$

Which of the following are true ?

- (a) $v(x, y)$ is a positive monotonic transformation of $u(x, y)$.
- (b) In case of both $u(x, y)$ and $v(x, y)$, the utility maximizing choices remain same.
- (c) Both utility functions achieve same maximum values.
- (A) Both (a) and (b)
- (B) Both (a) and (c)
- (C) Both (b) and (c)
- (D) All (a), (b) and (c)

11. For the production function $y = K\left(\alpha x_1^\rho + (1-\alpha)x_2^\rho\right)^{\frac{1}{\rho}}$, if $\rho = 1$ then the isoquants become

- (A) L – shaped
- (B) Straight lines
- (C) Strictly Convex
- (D) Strictly Concave

12. Suppose that the consumer faces the demand $D(p) = 20 - 2p$. At price = 4, the consumer surplus will be

- (A) 16
- (B) 20
- (C) 36
- (D) 30

13. Which of the following is true for a sub-game perfect Nash equilibrium ?

- (A) It induces a Nash equilibrium in every subgame of the game.
- (B) It induces Dominant strategies in at least one subgame of the game.
- (C) Both (A) and (B)
- (D) None of the above

14. Which of the following assumptions is not satisfied by the lexicographic ordering ?

- (A) Completeness
- (B) Reflexivity
- (C) Transitivity
- (D) Continuity



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15. A monopolist has a demand curve with constant price elasticity with absolute value 4. The monopolist charges a price of ₹ 60 per unit of output. What will be her marginal cost at this level of output ?

- (A) 24 (B) 135
(C) 45 (D) 54

16. The market equilibria fail to be Pareto optimal in the presence of

- (A) Externalities (B) Market power
(C) Asymmetric information (D) All of these

17. Consider a two good economy where y is a numeraire good.

$$U(x, y) = x + 2y$$

$$Px + y = 100$$

If, $P = 2$, then find the optimal bundle.

- (A) (50, 50) (B) (0, 50)
(C) (0, 100) (D) (100, 0)

18. In the IS-LM model, when is the IS curve vertical ?

- (A) Consumption is interest inelastic.
(B) Consumption is a positive function of interest rate.
(C) Investment is a positive function of income.
(D) Investment is interest inelastic.

19. Consider a closed controlled economy with unlimited supplies of labour in which the incremental capital-output ratio is 4 and the rate of population growth is 1.5% per annum. If the economy wants to attain a growth rate of per capita income of 6% per annum, what must be the savings rate (in percent) in the economy ?

- (A) 24 (B) 27.5
(C) 30 (D) 36



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- 20.** If in an economy all production is undertaken by firms and the recorded sales of all firms in a year are less than their respective recorded costs, then which of the following statements is necessarily true ?
- (A) The total purchases of intermediates by firms were more than their total sales.
 - (B) At least some firms must have made accounting errors.
 - (C) The economy's GDP of that year was negative.
 - (D) Neither of the above
- 21.** In the AD-AS model, the level of aggregate demand can influence the level of output
- (A) If and only if the price level is constant.
 - (B) If and only if aggregate supply is not invariant with changes in the price level.
 - (C) If and only if aggregate supply has a positive relationship with the price level.
 - (D) If and only if aggregate supply is invariant with changes in the price level.
- 22.** "At current prices, the gross fixed capital formation of the public sector has increased by 23.5% from 6.4 lakh crore in 2011-12 to 7.9 lakh crore in 2012-13, that of private corporate sector by 0.8% from 8.5 lakh crore in 2011-12 to 8.6 lakh crore in 2012-13, and the household sector by 3.9% from 13.7 lakh crore in 2011-12 to 14.3 lakh crore in 2012-13". The government expenditure to GDP ratio in 2012-13 would then approximately be
- (A) 15%
 - (B) 20%
 - (C) 25%
 - (D) 30%
- 23.** When the central bank seeks to keep the interest rate at a target level
- (A) fiscal policy is ineffective.
 - (B) fiscal policy is fully effective.
 - (C) fiscal policy is only partially effective.
 - (D) fiscal policy variables become endogenous.
- 24.** Policy Trilemma refers to
- (A) Fixed exchange rate, independent monetary policy and perfect capital mobility
 - (B) Flexible exchange rate, independent monetary policy and imperfect capital mobility
 - (C) Fixed exchange rate, independent fiscal policy and perfect capital mobility
 - (D) Flexible exchange rate, independent fiscal policy and imperfect capital mobility



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25. Frictional unemployment arises because
- (A) Economy is forever changing
 - (B) Minimum wage laws persist
 - (C) Unions exercises their bargaining power
 - (D) Existence of efficiency wages
26. The J – curve effect of the depreciation of the exchange rate indicates trade balance to
- (A) Improve in the short-run
 - (B) Worsen in the short-run
 - (C) Worsen in the long-run
 - (D) None of the above
27. In IS-LM framework with an external sector, the IS equation includes
- (A) Capital account balance
 - (B) Net export term
 - (C) Money supply function
 - (D) Economic growth equation
28. Suppose the government increases expenditure by ₹ 1,000 crore in the budget and finances it by raising taxes by ₹ 1,000 crore so that the government budget remains balanced. Then which of the following is true ?
- (A) GDP will remain the same as before.
 - (B) GDP will rise by ₹ 1,000 crore.
 - (C) GDP will rise by less than ₹ 1,000 crore.
 - (D) GDP will fall by ₹ 1,000 crore.
29. Tobin’s q theory suggests that it is profitable for a firm to invest if Tobin’s q is
- (A) Greater than unity
 - (B) Less than unity
 - (C) Greater than zero
 - (D) Less than zero
30. National income is equal to
- (A) GDP at factor cost
 - (B) NNP at factor cost
 - (C) GNP at factor cost
 - (D) All of the above



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31. If the nominal gross domestic product is ₹ 10,000 crores and the money supply in the economy is ₹ 8,000 crores, the velocity of money is
- (A) 1.25 (B) 2
(C) 18 (D) 0.8
32. In a binomial distribution, the sum of mean (μ) and variance (σ^2) is 15 and product of mean and variance is 54. Then the number of observations is equal to
- (A) 27 (B) 30
(C) 24 (D) 33
33. What would be the consequence for the OLS estimator if heteroscedasticity is present in a regression model but ignored
- (A) it will be biased (B) it will be inconsistent
(C) it will be inefficient (D) all of (A), (B) and (C) are true
34. The probability that a family chosen randomly for a sample survey owns a television is 0.86, owns a mobile is 0.35 and owns both a television set and a mobile is 0.29. What is the probability that such a family will own either a television set or a mobile ?
- (A) 0.80 (B) 0.96
(C) 0.92 (D) 0.88
35. If everyone in a country had the same level of income, the value of the Gini coefficient would be
- (A) 0 (B) 0.5
(C) 1 (D) infinity
36. The covid database gives covid data from March 2020 to date. Which of the following will be most appropriate to analyse this data ?
- (A) Mean (B) Variance
(C) Moving average (D) Correlation analysis
37. If the mean and mode of a moderately skew distribution is 4.5 and 5, find the median.
- (A) 4.75 (B) 1.33
(C) 4.25 (D) 4.67



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38. One use of a regression line is
- (A) to estimate the change in y for a one-unit change in x .
 - (B) to determine if any x -values are outliers.
 - (C) to determine if any y -values are outliers.
 - (D) to determine if a change in x causes a change in y .
39. A type 1 error occurs when one
- (A) fails to reject a false null hypothesis
 - (B) rejects a true null hypothesis
 - (C) rejects a false alternative hypothesis
 - (D) accepts a true alternative hypothesis
40. Two events A and B will be independent if
- (A) A and B are mutually exclusive
 - (B) $P(A' \cap B') = [1 - P(A)][1 - P(B)]$
 - (C) $P(A) = P(B)$
 - (D) $P(A) + P(B) = 1$
41. A firm produces mobile phones in three plants A , B and C with daily production of 500, 1000 and 2000 units respectively. It is known that the fractions of defective items in the plants are 0.005, 0.008 and 0.01. A phone is selected at random from a day's total production and is found to be defective. What is the probability that it came from the first plant ?
- (A) 0.25
 - (B) 8/40
 - (C) 8/35
 - (D) 5/61
42. If the mean and variance of the binomial distribution are 2 and $4/3$ respectively, find the probability of obtaining exactly two successes.
- (A) $16/81$
 - (B) $6/81$
 - (C) $256/729$
 - (D) $80/243$
43. The violation of the assumption of constant variance of the residual is known as
- (A) homoscedasticity
 - (B) heteroscedasticity
 - (C) multicollinearity
 - (D) autocorrelation



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44. The intercept in linear regression represents :
- (A) the strength of the relationship between x and y
 - (B) the expected x value when y is zero
 - (C) the expected y value when x is zero
 - (D) a popular parameter
45. A parameter is :
- (A) a sample characteristic
 - (B) a population characteristic
 - (C) unknown
 - (D) normally distributed
46. What test should be used to check if the mean of a sample is equal to some specific value, when standard deviation is known ?
- (A) z test
 - (B) t test
 - (C) F test
 - (D) χ^2 test
47. The Durbin – Watson test statistic ‘d’ has a range of
- (A) [0, 4]
 - (B) [-2, 2]
 - (C) [-1, 1]
 - (D) [-4, 4]
48. Let us consider two random variables X and Y such that $E[X] = 0$, $E[Y] = 0$, $E[XY] = 5$. The minimum value of var [X + Y] is
- (A) 5
 - (B) 0
 - (C) 1
 - (D) 10
49. The GDP of a country is growing at 5%, its population growth rate is 2% and income elasticity for food is 0.5. The growth rate of food demand is
- (A) 5%
 - (B) 2.5%
 - (C) 2%
 - (D) 3.5%
50. The Lewis model of growth in a dual economy tells that the growth rate of the money wage in the modern sector is
- (A) Zero
 - (B) Constant
 - (C) Equal to rate of inflation
 - (D) Equal to the growth rate of labour



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