

SECOND MID TERM TEST - 2024

Standard XI

Reg.No.

BUSINESS MATHEMATICS AND STATISTICS

Marks : 45

10 x 1 = 10

Time : 1.30 hrs

Part - I

- I. Choose the correct answer:
1. If the demand function is said to be elastic, then
 a) $\eta_d > 1$ b) $\eta_d = 1$ c) $\eta_d < 1$ d) $\eta_d = 0$
 2. Profit $P(x)$ is maximum when
 a) $MR = MC$ b) $MR = 0$ c) $MC = AC$ d) $TR = AC$
 3. A company begins to earn profit at
 a) Maximum point b) Breakeven point
 c) Stationary point d) Even point
 4. The brokerage paid by a person on the sale of 400 shares of face value ₹100 at 1% brokerage
 a) ₹600 b) ₹500 c) ₹200 d) ₹400
 5. Example of contingent annuity is
 a) Installments of payment for a plot of land
 b) An endowment fund to give scholarships to a student
 c) Personal loan from a bank d) All the above
 6. A fee for their service is called.
 a) Stock exchange b) Dividend c) The brokerage d) Market price
 7. Probability of an impossible event is
 a) 1 b) 0 c) 0.2 d) 0.5
 8. The geometric mean of two numbers 8 and 18 shall be
 a) 12 b) 13 c) 15 d) 11.08
 9. Who was the first person to obtain a quantitative measure of uncertainty?
 a) James Bernoulli b) Sir Ronald Fisher c) Galileo d) Karl Pearson
 10. When calculating the average growth of economy, the correct mean to use is?
 a) Weighted mean b) Arithmetic mean c) Geometric mean d) Harmonic mean

Part - II

II. Answer any 4 questions. (Q.No.16 is compulsory) 4 x 2 = 8

11. The total cost C in Rupees of making x units of a product is $C(x) = 50 + 4x + 3\sqrt{x}$. Find the marginal cost of the product at 9 units of output.
12. Show that the function $f(x) = x^3 - 3x^2 + 4x$, $x \in R$ is strictly increasing function on R .
13. What is the amount of perpetual annuity of ₹50 at 5% compound interest per year?
14. A person buys 20 shares of par value of ₹10 of a company which pays 9% dividend at such a price that he gets 12% on his money. Find the market value of a share.
15. A person purchases tomatoes from each of the 4 places at the rate of 1kg., 2kg., 3kg., and 4kg. per rupee respectively. On the average, how many kilograms has he purchased per rupee? *If a die (i) prime num (ii) a no greater than or equal to 3.*
16. Let $P(A) = 3/5$, and $P(B) = 1/5$. Find $P(A \cap B)$ if A and B are independent events.

$$50 \times \frac{1}{100} = \frac{50}{100} = \frac{1}{2}$$

20 Find the annual rate of interest to get a perpetuity of ₹675 for every half yearly from the present value of ₹30,000.

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Part - III

4 x 3 = 12.

III. Answer any 4 questions. (Q.No.22 is compulsory)

17. A manufacturer has to supply 12,000 units of a product per year to his customer. The ordering cost (C3) is ₹100 per order and carrying cost is ₹0.80 per item per month. Assuming there is no shortage cost and the replacement is instantaneous, determine the (i) economic order quantity, (ii) time between orders (iii) number of orders per year.
18. A person purchases a machine on 1st January 2009 and agrees to pay 10 installments each of ₹12,000 at the end of every year inclusive of compound rate of 15%. Find the present value of the machine. $[(1.15)^{10} = 4.016]$.
19. Which is better investment? 7% of ₹100 shares at ₹120 (or) 8% of ₹100 shares at ₹135.
20. Calculate the Mean Deviation about mean and its coefficient of the income groups of five, given below.

Income Rs.	4000	4200	4400	4600	4800
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21. Calculate GM for the following table gives the weight of 31 persons in the sample survey.

Weight (lbs)	130	135	140	145	146	148	149	150	157
Frequency	3	4	6	6	3	5	2	1	1

22. Find out indicated Elasticity for the function $p = xe^x, x > 0; n_s \ 2 \ (i)$.

Part - IV

IV. Answer all the questions.

3 x 5 = 15

23. a) The demand for a commodity x is $q = 5 - 2p_1 + p_2 - p_1^2 p_2$. Find the partial elasticities

$\frac{Eq}{Ep_1}$ and $\frac{Eq}{Ep_2}$ when $p_1 = 3$ and $p_2 = 7$. (OR) Ex. 6.43.

- b) A man invest ₹96,000 on ₹100 shares at ₹80. If the company pays him 18% as dividend, find (i) the number of shares he bought (ii) the dividend (iii) percentage of return. Ex. 7.16.

24. a) Bag I contains 3 red and 4 blue balls while another Bag II contains 5 red and 6 blue balls. One ball is drawn at random from one of the bags and it is found to be red. Find the probability that it was drawn from second Bag. (OR) Ex. 8.31.

- b) Mohan invested ₹29,040 in 15% of ₹100 shares of a company quoted at a premium of 20%. Calculate (i) the number of shares bought by Mohan (ii) his annual income from shares (iii) the percentage return on his investment Ex. 7.2(A)

25. a) Verify the relationship among AM, GM and HM for the following data

X	7	10	13	16	19	22	25	28
f	10	22	24	28	19	9	12	16

(OR)

- b) The total cost function for the production of x units of an item is given by $C(x) = \frac{1}{3}x^3 + 4x^2 - 25x + 7$. Find (i) Average cost function (ii) Average variable cost function (iii) Average fixed cost function (iv) Marginal cost function and (v) Marginal Average cost function. Ex. 6.1
