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11

Reg. No.

Second Mid-Term Test - 2018

Time : 1.30 hrs. **BUSINESS MATHS** Max. Marks : 50

PART - A

Choose the correct answer **10 x 1 = 10**

1. Marginal revenue of the demand function $p = 20 - 3x$ is
   a) $20 - 6x$ b) $20 - 3x$ c) $20 + 6x$ d) $20 + 3x$

2. If $u = x^3 + 3xy^2 + y^3$ then $\frac{\partial^2 u}{\partial y \partial x}$ is
   a) 3 b) 6y c) 6x d) 2

3. A company begins to earn profit at
   a) maximum point b) break even point c) stationary point d) even point

4. A man purchases a stock of Rs.20000 at face value 100 at a premium of 20% then investment is
   a) Rs.20,000 b) Rs.25,000 c) Rs.22,000 d) Rs.30,000

5. The brokerage paid by a person on this sale of 400 shares of face value Rs.100 at 1% brokerage
   a) Rs.600 b) Rs.500 c) Rs.200 d) Rs.400

6. An annuity in which payments are made at the beginning of each payment period is called
   a) Annuity due b) an immediate annuity c) perpetual annuity d) none of these

7. The income on 7% stock at 80 is
   a) 9% b) 8.75% c) 8% d) 7%

8. The geometric mean of two numbers 8 and 18 shall be
   a) 12 b) 13 c) 15 d) 11.08

9. Median is same as
   a) Q_1 b) Q_2 c) Q_3 d) D_2

10. The probability of drawing a spade from a pack of card is

a) $\frac{1}{52}$ b) $\frac{1}{13}$ c) $\frac{4}{13}$ d) $\frac{1}{4}$

PART - D

Answer 5 questions. **5 x 2 = 10**

Question number 14 is compulsory

11. For the given demand function $p = 40 - x$ find the value of the output when $\eta d = 1$
12. For the function $y = x^3 + 19$, find the values of x when x equal to 27.
13. The cost function of a firm is $C = x^3 - 12x^2 + 48x$ find the level of output $(x > 0)$ at which average cost is minimum.
14. Find the market vlaue of Rs.325 shares of amount Rs.100 at a premium of Rs.18.
15. If the divided received from 10% of Rs.25 shares is Rs.2000. Find the number of shares.
16. Find the first quartile and third quartile for the given observations.
2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22
17. An unbiased die is thrown. If A is the event the number appearing is a multiple of 3 and B be the event the number appearing is even find whether A and B are independent.

PART - C

Answer 5 questions. **5 x 3 = 15**

Question number 22 is compulsory.

18. If $y = \frac{2x+1}{3x+2}$ then obtain the value of elasticity at x = 1
19. A manufacturer has to supply 12000 units of a product per year to his customer. The ordering cost (C_3) is Rs.100 per order

and carrying cost is Rs.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

20. A person pays Rs.64000 per annum for 12 years at the rate of 10% per year. Find the annuity $[(1.1)^{12} = 3.3184]$

21. Which is better investment 12% Rs.20 shares at Rs.16 (or) 15% Rs.20 shares of Rs.24.

22. Computer Q_1, D_2 and P_{90} from the following data.

Marks :	10	20	30	40	50	60
Number of students :	4	7	15	8	7	2

23. Calculate G.M for the following table gives the weight of 31 persons in sample.

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

24. Find the probability of drawinga queen, a king and a knave (Jack) in that order from a pack of cards in three consecutive draws. the card drawn not being replaced.

PART - C

Answer all questions. **3 x 5 = 15**

25. Verify the relationship of elasticity of demand, average revenue and marginal revenue for the demand law p = 50 – 3x. **(OR)**

Let $u = \log \frac{x^4 + y^4}{x + y}$, by using Euler's theorem.

Show that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = 3$

26. The age of the daughter is 2 years. Her father wants to get Rs.20,00,000 when his ward becomes 22 years. He opens an account with a bank at 10% rate of compound interest. What amount should be deposit at the end of every month in this recurring account. $[(1.0083)^{240} = 6.194]$.

(OR)

Sundar bought 4500 of 10 shares, paying 2% per annum. He sold them when the price rose to Rs.23 and invested the proceeds in Rs.25 shares paying 10% per annum at Rs.18. Find the change in his income.

27. Find out the coefficient of mean deviation about median in the following series.

Age in yrs	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No.of persons	20	25	32	40	42	35	10	8

(OR)

A factory has 3 machines A_1, A_2, A_3 producing 1000, 2000, 3000 screws per day respectively. A_1 produce 1% defectives A_2 produces 1.5% and A_3 produces 2% dfectives. A screw is chosen at random at the end of a day and found defective. What is the probability that it comes from machine A_1?