Model Question Paper

Application of differentiation- I - Part II

12th Standard

Business Maths

Reg.No. : | | | | | | |

I.Answer all the questions.
II.Use Blue pen only.
III.Question No 13 is compulsory.

Time : 01:00:00 Hrs

Total Marks : 75

Section-A

4 x 1 = 4

1) Given the demand equation $p = -x + 10; (0 \leq x \leq 10)$ Where p denotes the unit selling price and x denotes the number of units demanded of some product. Then the marginal revenue at x =3 units is

   (a) Rs.5 (b) Rs. 10 (c) Rs. 4 (d) Rs .30

2) The demand for some commodity is given by $q = -3p + 15 (0 < p < 5)$ Where p is the unit price . The elasticity of demand is

   (a) $\frac{9p^2+15}{p}$ (b) $\frac{9p-45}{p}$ (c) $\frac{15p-9}{p}$ (d) $\frac{p}{-p+5}$

3) For the function y = 3x + 2 the average rate of change of y and x increases from 1.5 to 1.6 is

   (a) 1 (b) 0.5 (c) 0.6 (d) 3.

4) If $y = 2x^2 + 3x$,the instantaneous rate of change of y at x = 4 is

   (a) 16 (b) 19 (c) 30 (d) 4

Section-B

5 x 6 = 30

5) If the total cost C of making x units is $C = 50 + 10x + 5x^2$. Find the average cost and marginal cost When x = 1.3 .

6) The total cost C of producing x units is $C = 0.00004x^3 - 0.002x^2 + 3x + 10,000$. Find the marginal cost of 1000 units output .

7) Show that the elasticity of demand at all points on the curve $xy = C^2$ (y being price, and c is the constant) will be numerically equal to one .

8) Show that the elasticity of demand function $p = \frac{100}{q}$ is unity for every value of q.

9) Find the elasticity of supply for the supply function $x = 2p^2 + 5$

Section-C

5 x 10 = 50

10) The supply of certain items is given by the supply function $x = a\sqrt{p-b}$, Where p is the price, a and b are positive constants. (p> b) . Find an expression for elasticity of supply η_s Show that it becomes unity When the price is 2b.

11) For the demand function $p = 550 - 3x - 6x^2$ Where x is the quantity demanded and p is the price per unit , find the average revenue and marginal revenue.

12) The sales S, for the product with price x is given by $S = 20,000\, e^{-0.6x}$ Find (i) total sales revenue R , Where R = x S (ii) Marginal revenue

13) a) The price and quantity q of a commodity are related by the equation $q = 32 - 4p - p^2$. Find the elasticity of demand and marginal revenue When p = 3 .

(OR)

   b) A point moves on the graph of xy = 8 in such a manner that its y- coordinate is increasing at a rate of 2 units per second, When the point is at (2, 4). Find the rate of change of the x - coordinate at the moment.

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