

Model Question Paper
Application of differentiation- I - Part I

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

4 x 1 = 4

Section-A

- 1) The average fixed cost of the function $C = 2x^3 - 3x^2 + 4x + 8$ is
(a) $\frac{2}{x}$ (b) $\frac{4}{x}$ (c) $\frac{-3}{x}$ (d) $\frac{8}{x}$
- 2) If 60 units of some product cost Rs.1400 and 40 units cost Rs.1200 to manufacture, then the variable cost per unit is
(a) Rs.100 (b) Rs.2600 (c) Rs.10 (d) Rs. 5
- 3) If 20 units of some product cost Rs.2500 and 50 units cost Rs. 3400 to produce, the linear cost function is
(a) $y = 30x + 1900$ (b) $y = 20x + 5900$ (c) $y = 50x + 3400$ (d) $y = 10x + 900$
- 4) Variable cost per unit is Rs. 40, fixed cost is Rs. 900 and unit selling price is Rs. 70. Then the profit equation is
(a) $P = 30x - 900$ (b) $P = 15x - 70$ (c) $P = 40x - 900$ (d) $P = 70x + 3600$

Section-B

5 x 6 = 30

- 5) A firm produces x tonnes of output at a total cost $C(x) = Rs. (\frac{1}{2}x^3 - 4x^2 + 25x + 8)$ Find (i) Average cost (ii) Average variable Cost and (iii) Average Fixed cost. Also find the value of each of the above when the output level is 10 tonnes.
- 6) The total cost C of making x units of product is $C(x) = 25 + 3x^2 + \sqrt{x}$. Find the marginal cost at output level of 100 units.
- 7) The total cost of making x units is given by $C(x) = 50 + 5x + 2\sqrt{x}$. What is the marginal cost at 100 units of output?
- 8) If the cost of making x units is $C = \frac{1}{2}x + 26\sqrt{x} + 4$. Find the marginal cost at output of 96 units.
- 9) The cost function for the production of x units of an item is given by $C = \frac{1}{10}x^3 - 4x^2 + 8x + 4$. Find (i) the average cost (ii) the marginal cost and (iii) The marginal average cost.

Section-C

4 x 10 = 40

- 10) If the total cost C of making x tonnes of a product is $C = 10 + 30\sqrt{x}$. Find the marginal cost at 100 tonnes output and find the level of output at which the marginal cost is Rs. 0.40 per ton
- 11) Find the elasticity of demand when the demand is $q = \frac{20}{p+1}$ and $p = 3$. Interpret the result.
- 12) Given the demand function $q = 165 - 3p - 2p^2$, find the elasticity of demand at the price $p = 5$. Interpret the result.
- 13) a) Find the elasticity of demand with respect to the price for the demand functions. (i) $p = \sqrt{a - bx}$, a and b are constants (ii) $x = \frac{8}{p^{3/2}}$
(OR)
b) A demand curve is $xp^m = b$ where m and b are constants. Calculate the price elasticity of demand.
