Model Question Paper

Applications of Integration - Part III

12th Standard

Business Maths

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

I.Answer all the questions.
II.Use blue pen only.
III.Question number 16 is compulsory.

Time : 01:30:00 Hrs

Total Marks : 95

Part-A

5 x 1 = 5

1) If the marginal cost function $MC = 2 - 4x$, then the cost function is

(a) $2x - 2x^2 + k$ (b) $2 - 4x^2$ (c) $\frac{2}{x} - 4$ (d) $2x - 4x^2$

2) The marginal revenue of a firm is $MR = 15 - 8x$. Then the revenue function is

(a) $15x - 4x^2 + k$ (b) $\frac{15}{x} - 8$ (c) -8 (d) $15x - 8$

3) The marginal revenue $R'(x) = \frac{1}{x+1}$ then the revenue function is

(a) $log|x+1| + k$ (b) $-\frac{1}{(x+1)}$ (c) $\frac{1}{(x+1)^2}$ (d) $log\frac{1}{(x+1)}$

4) The consumers' surplus for the demand function $p = f(x)$ for the quantity $x_o$and price p_o is

(a) $\int_0^{x_o} f(x)dx - p_o x_o$ (b) $\int_0^{x_o} f(x)dx$ (c) $p_o x_o - \int_0^{x_o} f(x)dx$ (d) $\int_0^{p_o} f(x)dx$

5) The producers' surplus for the supply function $p = g(x)$ for the quantity x_o and price p_o is

(a) $\int_0^{x_o} g(x)dx - p_o x_o$ (b) $p_o x_o - \int_0^{x_o} g(x)dx$ (c) $\int_0^{x_o} g(x)dx$ (d) $\int_0^{p_o} g(x)dx$

Part-B

5 x 6 = 30

6) Find the area under the demand curve $xy = 1$bounded by the ordinates $x = 3$, $x = 9$ and x-axis.

7) Find the area cut off from the parabola $y^2 = 4ax$by its latus rectum.

8) Find the area bounded by the curve $x = 3y^2 - 9$ and the lines $x = 0$, $y = 0$ and $y = 1$.

9) Find the area above the axis of x bounded by $y = \frac{4}{x}$, $x = 1$ and $x = 4$.

10) Find the area of the circle of radius 'a' using integration.

Part-C

7 x 10 = 70

11) The elasticity of demand with respect to price p for a commodity is $\frac{x-5}{x}$, $x > 5$ when the demand is 'x'. Find the demand function if the price is 2 when demand is 7. Also find the revenue function.

12) The elasticity of demand with respect to price for a commodity is a constant and is equal to 2. Find the demand function and hence the total revenue function, given that when the price is 1, the demand is 4.

13) The demand and supply function under pure competition are p_d=16-x^2 and p_s=$2x^2$+4. Find the consumers' surplus and producers' surplus at the market equilibrium price.

14) The marginal cost and marginal revenue with respect to a commodity of a firm are given by $C\prime(x) = 4 + 0.08x$ and $R\prime(x) = 12$. Find the total profit, given that the total cost at zero output is zero.

15) The marginal revenue function (in thousands of rupees) of a com m o d ity is 7+ $e^{0.05x}$ where x is the number of units sold. Find the total revenue from the sale of 100 units (e^{-5} = 0.0067)

16) a) The marginal cost C'(x) and marginal revenue R'(x) are given by C'(x) = 20 + $\frac{X}{20}$ and R'(x) = 30 The fixed cost is Rs. 200. Determine the maximum profit.

(OR)

b) A company determines that the marginal cost of producing x units is C'(x) = 10.6x. The fixed cost is Rs. 50. The selling price per unit is Rs. 5. Find (i) Total cost function (ii) Total revenue function (iii) Profit function.

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