

Model Question Paper
Applications of Integration - Part II

12th Standard

Business Maths

Reg.No. :

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I. Answer all the questions.

II. Use blue pen only.

Time : 01:30:00 Hrs

Total Marks : 85

5 x 1 = 5

Part-A

- 1) $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \cos x dx =$
(a) 2 (b) -2 (c) -1 (d) 1
- 2) The area under the curve $y = f(x)$, the x -axis and the ordinates at $x = a$ and $x = b$ is
(a) $\int_a^b y dx$ (b) $\int_a^b y dy$ (c) $\int_a^b x dy$ (d) $\int_a^b x dx$
- 3) The area under the curve $x = g(y)$, the y -axis and the lines $y = c$, $y = d$ is
(a) $\int_c^d y dy$ (b) $\int_c^d x dy$ (c) $\int_c^d y dx$ (d) $\int_c^d x dx$
- 4) The area bounded by the curve $y = e^x$, the x -axis and the lines $x = 0$ and $x = 2$ is
(a) $e^2 - 1$ (b) $e^2 + 1$ (c) e^2 (d) $e^2 - 2$
- 5) The area bounded by $y = x$, y -axis and $y = 1$ is
(a) 1 (b) $\frac{1}{2}$ (c) $\log 2$ (d) 2

Part-B

- 6) Evaluate the following using the properties of definite integral : $\int_0^1 x(1-x)^3 dx$
- 7) Find the area under the curve $y = 4x - x^2$ included between $x = 0$, $x = 3$ and the x -axis
- 8) Find the area of the region bounded by the curve $y = 3x^2 - 4x + 5$ the x -axis and the lines $x = 1$, $x = 2$.
- 9) Find the area under the curve $y = \frac{1}{1+x^2}$, x -axis, $x = -1$ and $x = 1$.
- 10) Find the area contained between the x -axis and one arch of the curve $y = \cos x$ bounded between $x = -\frac{\pi}{2}$, $x = \frac{\pi}{2}$

Part-C

- 11) The elasticity of demand with respect to price ' p ' is $\frac{3-x}{x}$, $x < 3$. Find the demand function and the revenue function when the price is 2 and the demand is 1.
- 12) The elasticity of demand with respect to price p for a commodity is $\frac{p}{x^2}$, when the demand is x . Find the demand function and revenue function if the demand is 2 when the price is 3.
- 13) The marginal cost of production of a firm is given by $C'(x) = 5 + 0.13x$. The marginal revenue is given by $R'(x) = 18$. The fixed cost is Rs.120. Find the profit function.
- 14) The marginal revenue (in thousands of rupees) of a commodity is $R'(x) = 4 + e^{-0.03x}$ where x denotes the number of units sold. Determine the total revenue from the sale of 100 units of the commodity ($e^{-3} = 0.05$)
- 15) The demand and supply function for a commodity are $p_d = 16 - 2x$ and $p_s = x^2 + 1$. Find the consumers' surplus and producers' surplus at the market equilibrium price.
