2/151

2001E1208

Candidate's Seat No :_____

IMBA in BI/APR (NEP) Sem.-1 Examination

MDC-BM-114

BM

Time : 2-00 Hours] **January-2025** **[Max. Marks : 50**

Instructions :(1) This paper contains **Five** questions.
(2) All questions are compulsory.
(3) Question No.**1,2, 3, 4** have internal options.
(4) Figures in the right side in parenthesis indicate marks.

Q:1 **(A)** If A= $\{0,1,2,3,4\}$ and B = $\{x/x^2+x-6=0, x \in A\}$ and $C = \{x/x^2+x-12=0, x \in A$ Obtain $(B-C) \cup (C-B)$ and $(B-C) \cap (C-B)$ **(05)**

(B) In a class of 42 students, each play atleast one of the three games cricket, hockey and football. It is found that 14 play cricket, 20 play hockey and 24 play football, 3 play both cricket and football, 2 play both hockey and football. None play all the three games. Find the number of students who play cricket but not hockey. **(05)**

OR

Q:1 Define the following and give one example of each: **(10)**

i. Set builder method
ii. Complement of a set
iii. Intersections of a sets
iv. Infinite set
v. Difference of sets

Q:2 Find $f(\frac{1}{a})$ in terms of a, when $f(x) = \frac{(2x-1)(x-2)}{(1-2x+x^2)}$ Hence show that $f(a) = f(\frac{1}{a})$ **(10)**

OR

Q:2 Find the value of: $\lim_{x \to 1} \frac{\sqrt{x-1}}{\sqrt{x^2-1}+\sqrt{x^3-1}}$ **(10)**

(P.T.O)

Q:3 If $y = \log\left[e^x \left(\frac{x-2}{x+2}\right)^{3/4}\right]$. Prove that $\frac{dy}{dx} = \frac{x^2-1}{x^2-4}$ **(10)**

OR

Q:3 If $y = xe^x$, prove that $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = 0$ **(10)**

Q:4 A radio manufacture produces x radio sets daily with a total cost of $\frac{x^2}{20} + 4x + 30$. The demand function for him is $x = 30 - 2p$. How many sets should be daily produce as a monopolist to get maximum profit? Also determine the price per set, for maximum profit. **(10)**

OR

Q:4 (A) For supply function $x = 5 + 2p^2$, find elasticity of supply at p =2 and p =3 **(05)**

(B) The demand function of a commodity is $x = 30 - \sqrt{p}$. Calculate elasticity of demand, when price of the commodity is 100. **(05)**

Q:5 Do as directed (Any TEN): **(10)**

1. If A=$\{a, b, c\}$, give power set of A.
2. Define break-even point.
3. What do you mean by $x \to a$.
4. Find the derivative of the $7x^2 - 9$.
5. Give necessary and sufficient condition for a function to be maximum.
6. State relationship between marginal revenue, average revenue and elasticity of demand.
7. State multiplication rule of derivative.
8. Draw venn-diagram of $A - (B \cup C)$.
9. What is set?
10. Give name of different types of function.
11. If $f(x) = 3x^2 + 2x + 5$, then find $f'(x)$.
12. Give formula of elasticity of supply.