Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐☐   Total No. of Pages : 02

Total No. of Questions : 07

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

2. SECTION-B contains SIX questions carrying TEN marks each and students has to attempt any FOUR questions.

SECTION-A

l. Write short notes on :

(a) Union of Sets.

(b) If *a, b, c, d* are +ve real numbers, then

$a > b,\ c > d\ \Rightarrow a + c > b + d$.

(c) Solve : $\dfrac{2}{x} + \dfrac{3}{y} = 18,\ \dfrac{4}{x} + \dfrac{9}{y} = 48$.

(d) How many permutations of the letter of word APPLE are there ?

(e) Define Conditional Statement.

(f) Show that $\underset{\sqrt{\ }}{\text{Lt}}\ \dfrac{x^2 - 2}{\sqrt{\ }} = 2\sqrt{2}$.

(g) Find derivative of $\dfrac{x + 2}{3 + \log x}$ w.r.t. *x*.

(h) Evaluate $\log_3 81$.

(i) Find *n*th term of an A.P. whose sum of *n* terms is $3n^2 + n$.

(j) Give example of a matrix to show that AB = 0 even if A ≠ 0, B ≠ 0.

SECTION-B

2. (a) Prove that $A \cup (B \backslash A) = A \cup B$.

   (b) If $f(x) = 2^x$ show that $f(x + 3) - f(x - 1) = \dfrac{15}{2} f(x)$.

3. (a) Find the 5th term in the expansion of $\left(\dfrac{4x}{3} - \dfrac{3}{2} \right)^7$.

   (b) If 14th term of an A.P. is 6 and 6th term is 14, find 95th term.

4. Find Maximum and Minimum value of the function :

   $$f(x) = x^3 + 15x^2 + 48x + 7.$$

5. (a) Prove that $\log \dfrac{75}{16} - 2\log \dfrac{5}{9} + \log \dfrac{32}{243} = \log 2$.

   (b) Find the truth table for $[p \rightarrow \sim q] \wedge (p \vee r] \rightarrow q$

6. How may different words containing all the letters of the word 'SOCIETY' can be formed ? Also find the number of different seven letter words formed from the letters of the/word 'SOCIETY' if each word :

   (i) Begins with S and ends with Y.

   (ii) To have vowels never together.

7. Use Cramer's Rule to find solution of the equations :

   $$2x - y + 3z = 9$$
   $$x + y + z = 6$$