First Terminal Examination-2079

Class : 11 **Full Marks : 37.5**

Time : 1.5 hrs. **Subject : Mathematics**

Group-A (1x5=5)

Rewrite the correct option in your answer sheet.

1. If A = [-3, 1) and B = [-2, 4] then B - A is

   a. [-3, 4] b. [-2, 1)

   c. [-3, -2) d. [1, 4]

2. Value of $\lim_{x \to p/2} \frac{1 + \cos 2x}{(p-2x)^2}$ is:

   a. $\frac{1}{3}$ b. $\frac{1}{6}$ c. $\frac{1}{2}$ d. $\frac{1}{4}$

3. If s ={a, b} then 2^s is:

   a. {Φ, {a}, {b}, {a, b}} b. { Φ, {a}}

   c. { Φ ,{b}, {a}} d. none of them

4. Value of $\lim_{n \to \infty} \frac{1 + 2 + 3 + ... + n}{n^2}$ is:

   a. $\frac{1}{2}$ b. 1

   c. $-\frac{1}{2}$ d. -1

5. Value of $\lim_{x \to 0} \frac{\sqrt{1+x} - 1}{(1+x)^{1/3} - 1}$ is:

   a. $\frac{1}{2}$ b. $\frac{3}{2}$ c. $-\frac{3}{2}$ d. $-\frac{1}{2}$

Group-B (5x5=25)

6. Prove geometrically, $\lim_{q \to 0} \frac{\sin q}{q} = 1$ [5]

7. Evaluate $\lim_{x \to 1} \frac{x - \sqrt{2 - x^2}}{2x - \sqrt{2 + 2x^2}}$ [5]

8. Define absolute value of a real number. Solve the inequality $|2x + 1| \geq 3$. Represent the solution in a real line. [1+3+1=5]

9. Define union and intersection of two sets. If A, B and C are any three non-empty sets. Prove that $A \cap (B \cup C) = (A \cap B \cup (A \cap C)$ [1+1+3=5]

10. Evaluate $\lim_{x \to y} \frac{x\cot y - y\cot x}{x - y}$ [5]

Group-C (1x7.5=7.5)

11. a. For non-empty sets A and B if $A \cap B = \theta$, prove that $B \subset \bar{A}$. [1]

b. Prove geometrically : $\lim_{q \to 0} \sin q = 0$ [3]

c. Solve the inequality : $6 + 5x - x^2 \geq 0$

OR

If a be any positive number and $x \in R$

Prove that $|x| < a \Leftrightarrow -a < x < a$ [3.5]

THE END