Group 'A' [1x4=4]

Rewrite the correct option in your answer sheet

1. Which of the following is not an indeterminate form?
   a. $\frac{\infty}{\infty}$ b. $\frac{0}{0}$ c. $\infty + \infty$ d. ∞^0
2. The statement $\sim(p \wedge q)$ is logically equivalent to
   a. $\sim p \wedge \sim q$ b. $\sim p \vee \sim q$ c. $\sim p \wedge q$ d. $p \vee \sim q$
3. The value of $\lim_{x\to 2} \frac{x^5-32}{x-2}$ is
   a. $\frac{0}{0}$ b. 80 c. 16 d. does not exist
4. Which points are the same sides of the line $x - y + 1 = 0$?
   a. (3,2), (−3,1) b. (−3,1), (3,−1)
   c. (2,2), (3,−1) d. (0,0), (−2,1)

Group 'B' [4x5=20]

5. Define limit of a function. Evaluate: $\lim_{x\to 2} \frac{x-\sqrt{8-x^2}}{\sqrt{x^2+12}-4}$. [1+4]
6. Verify with the truth table that $(p \to q) \leftrightarrow [p \wedge (\sim q) \to c]$ is a tautology, where p & q are the statements and c stands for contradiction. [5]
7. a. Find the value of k if the length of perpendicular from (2,-3) on the line $2x + ky + 3 = 0$ is 3. [2]
   b. If p be the length of perpendicular dropped from the origin on the line $\frac{x}{a} + \frac{y}{b} = 1$, prove that $\frac{1}{a^2} + \frac{1}{b^2} = \frac{1}{p^2}$. [3]
8. Find the equation of bisectors of the angle between the straight lines $3x - 4y + 3 = 0$ & $12x - 5y - 1 = 0$ and point out the bisector of the angle in which origin lies. [3+2]

Group 'C' [2x8=16]

9. a. What are the indeterminate form? [1]
   b. If $A = \{a, b, c\}$, find the subsets of A. [1]
   c. Evaluate: $\lim_{x\to\infty} \sqrt{x}(\sqrt{x} - \sqrt{x-a})$. [2]
   d. If p & p' be the length of perpendiculars from the origin upon the straight lines $x \sec\theta + y \operatorname{cosec}\theta = a$ & $x\cos\theta - y\sin\theta = a\cos 2\theta$, prove that $4p^2 + p'^2 = a^2$ [4]
10. a. Evaluate: $\lim_{x\to 2} \frac{x^2-x+6}{x^2-x-2}$. [2]
    b. Define tautology and contradiction with example. Show that the compound statement $(p \to r) \wedge (q \to r) \to (p \to r)$ is a tautology. [1+1+4]

End of Question