

# MATHEMATICS

Time: 2 ½ Hours 10th Class Karachi Board Max. Marks: 60

## SECTION B (SHORT-ANSWER QUESTIONS)(36)

NOTE: Attempt 9 questions from this Section.

2. If  $A = \{1, 2, 3, 4\}$  and  $B = \{2, 4, 6, 8\}$ , prove that  $(A \cup B) = (A \cap B) \cup (B \Delta A)$ .

3. Simplify  $\left(\frac{x^a}{x^b}\right)^{a+b} \times \left(\frac{x^b}{x^c}\right)^{b+c} \times \left(\frac{x^c}{x^a}\right)^{c+a}$

4. If  $x = 2 + \sqrt{3}$ , then find the value of  $x^2 + \frac{1}{x^2}$

5. Find the value of  $\frac{85.7 \times 2.47}{8.89}$  with the help of logarithmic table

6. Find the value of  $x^2 + y^2 + z^2$  when  $x + y + z = \sqrt{7}$  and  $xy + yz + zx = 2$

7. Resolve into factors:  $x^2(y - z) + y^2(z - x) + z^2(x - y)$

8. If two angles of a triangle are congruent, prove that the sides opposite to them are also congruent.

9. For what value of "q"  $4x^4 + 12x^3 + 25x^2 + 24x + q$  will be a perfect square?

10. Eliminate x from the following equations:

$$x + \frac{1}{x} = 2p, x - \frac{1}{x} = 2q + 1$$

11. Solve the equation  $x^2 - x - 56 = 0$  by using quadratic formula.

12. If  $\frac{a}{b} = \frac{c}{d} = \frac{e}{f}$ , Prove that  $(a^2 + c^2 + e^2)(b^2 + d^2 + f^2) = (ab + cd + ef)^2$

13. If a perpendicular is drawn from the centre to a chord of a circle, it bisects the chord. Prove.

14. Find all the trigonometric ratios of  $30^\circ$ .

15. If  $A = \begin{bmatrix} 3 & 2 \\ 1 & 0 \end{bmatrix}$ ; then find  $A^{-1}$  and verify that  $A.A^{-1} = 1$

16. Prove that  $\frac{1 - \sin \theta}{\cos \theta} = \frac{\cos \theta}{1 + \sin \theta}$

## SECTION C (DETAILED-ANSWER QUESTIONS)(24)

NOTE: Attempt 3 questions from this Section including the compulsory question No. 19.

17. Factorize the following:

(i)  $6a^2 - 11a - 10$

(ii)  $a^3 - a^2 + 2$

(iii)  $a^3 - 8b^3 + 27c^3 + 18abc$

(iv)  $4a^2 + 625b^2$

18. Find the solution set of the following equations graphically: (Find four ordered pairs for each equation.)

$$x - 2y = -3$$

$$2x + y = 14$$

19. In a correspondence of two triangles, if three sides of one triangle are congruent to the corresponding three sides of the other, the two triangles are congruent. Prove it.

20.(a) Find the variance of the following set of observations:

$$x = 11, 13, 25, 15, 12, 18, 17, 23, 20, 16$$

(b) Find the factors by means of Remainder Theorem:

$$x^3 + 7x^2 + 14x + 8$$

21. Construct a triangle ABC in which  $m\overline{AB} = 4\text{cm}$ ,  $m\overline{BC} = 5\text{cm}$ , and  $m\angle B = 60^\circ$ . Draw the circum circle of the triangle and write the steps of construction.