# MATHEMATICS 2013

**Time: 2 ½ Hours** **10th Class Karachi Board** **Max. Marks: 80**

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

**Note: Answer any 10 questions from this section. (50)**

2. If A = {1, 2, 3, 4} B = {2, 4, 5, 6} and C = {2, 3, 6, 8} then find (A – B) x (B – C).

3. Simplify: $\sqrt[4]{\frac{a^x}{a^y}} \times \sqrt[4]{\frac{a^y}{a^r}} \times \sqrt[4]{\frac{a^r}{a^x}}$

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

5. Find the value of $\frac{(86.2)^2 (37.37)}{591}$ With help of logrithmetic table.

6. Resolve into factors. $a^2 (b - c) + b^2 (c - a) + c^2 (c - b)$

7. If a transversal intersects two coplanar lines such that the pair of alternate angles are congruent. Prove that the lines are parallel.

8. What should be added to $4a^4 + 4a^3 + 5a^2 + 2a + 5$ so that it becomes a perfect square?

9. Solve, if possible by using Cramer's rule:

$$2x + 3y = -3$$
$$4x + 3y = 5$$

10. Solve the equation $2x^2 - 7x + 6 = 0$ by using quadratic equation.

11. Find all the trigonometric ratios of $45^\circ$.

12. Eliminate 'y' from the equations:

$$y = \frac{1}{y} = a, \; y^2 + \frac{1}{y^2} = 4a^2$$

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

14. If $\frac{a}{b} = \frac{c}{d} = \frac{e}{f}$ then prove that $\frac{a^4b^2 + a^2e^2 - e^4f}{b^6 + b^2f^2 - f^5} = \frac{a^4}{b^4}$

Prove that a = b = c.

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

16. A pole 14 metres high on the bank of a stream makes an angle of $30^\circ$ with a place on the opposite bank. Find the breadth of the stream.

## SECTION 'C' (DETAILED – ANSWER QUESTION)

**NOTE: Attempt 3 questions from this section. Including Q.no.19 which is compulsory. (30)**

17. Factorize the following:

(i) $x^4 + 4y^4$ (ii) $18y^2 + 9y - 20$

(iii) $x^3 - x - 2y + 8y^3$ (iv) $a^3 - 8b^3 + 27c^3 + 18abc$

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

$$2x - y = 5$$
$$x - 2y = 1$$

19. In a correspondence of two right angled triangles. If their hypotenuses are congruent and more side of one triangle is congruent to the corresponding 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 of $x^3 - 4x^2 + 5x - 2$ by means of Remainder Theorem.

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