# MATHEMATICS 2019

**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.(i) If A = {1, 2, 3, 4, 5, 6, 7, 8} and B = {2, 4, 6, 8, 10} then prove that: $A \Delta B = (A \cap B) - (A \cup B)$

(ii) Simplify: $\left(\frac{a^x}{a^y}\right)^{x+y} x \left(\frac{a^y}{a^z}\right)^{y+z} x \left(\frac{a^z}{a^x}\right)^{z+x}$

(iii) Find the value of the following with the helpof logarithmic table: $\frac{57.26}{\sqrt[3]{0.382}}$

3.(i) Find the value of $x^3 + y^3$ when $x + y = -5$ and $xy = 8$.

(ii) Find the solution set of the following equation and also verify the answer $\sqrt{25y-6} + 4\sqrt{y+3}$

(iii) For what values of a and b. $x^4 + 4x^3 + 10x^2 + ax + b$ will be a perfect square?

4.(i) Solve triangle ACB when $m\angle C = 90°$, c= Bcm, b=$4\sqrt{3}$ cm

(ii) Eliminate 'x' from the following equation:

$$x + \frac{1}{4} = 2p,\ x - \frac{1}{x} = 2q + 1$$

(iii) If $A = \begin{bmatrix} 3 & 2 \\ 5 & 4 \end{bmatrix}$ then find $A^{-1}$ and verify that $A.A^{-1} = 1$

5.(i) If a transversal intersects two coplanar lines such that the pair of alternate angles are congruent, then the lines are parallel. Prove it.

(ii) Prove that: $\frac{\sin\theta}{1-\cos\theta} = \frac{1+\cos\theta}{\sin\theta}$

(iii) Find the factors with the help of Remainder Theorem.

$X3 - 4x^2 + 5x - 2$

6.(i) Find the variance of the following observations:

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

(ii) If a:b = c:d then prove that $\frac{a^2+b^2}{a^2-b^2} = \frac{ac+bd}{ac-bd}$

(iii) The measure of a central angle of a minor arc of a circle is double that of the inscribed angle of the corresponding major arc. Prove it.

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

**NOTE: Attempt 3 questions from this Section including the compulsory question No. 7.**

7. 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.

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

$4x - y - 10 = 0;\ 3x + 5y - 19 = 0$

9.(a) If one pair of opposite sides of a quadrilateral are congruent and parallel, it is a parallelogram. Prove it.

(b) One and only one circle can pass through three non-collinear points. Prove it.

10. Factorize the following:

(i) $4a^4 + 325b^4$ (ii) $5x^2 - 13x - 6$

(iii) $27x^3 - 1 + 8y^6 + 18xy^2$ (iv) $x^6 - y^6$

11. The distance between two points P and Q is 7.5 cm. With the centre P, draw a circle of radius 4.5 cm. From the point Q draw a tangent to the circle. Measure the segment of the tangent. Also write steps of construction.