Mathematics (Science)	Tenth, 2025 Lahore Board	Group – I
Time: 20 Min.	Objective Type	Marks : 15

Note:

Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer book. Cutting or filling two or more circles will result in zero mark in that question.

1.1 $\text{Cosec}^2\theta - \cot^2\theta =$ -------- :

Ⓐ 0 Ⓑ –1
Ⓒ tan θ Ⓓ 1

2 Value of x in 4 : x : : 5 : 10 is:

Ⓐ 4 Ⓑ 8
Ⓒ 12 Ⓓ 16

3 $(A \cup B) \cup C =$ - - - - - :

Ⓐ $A \cap (B \cup C)$ Ⓑ $(A \cup B) \cap C$
Ⓒ $A \cup (B \cup C)$ Ⓓ $A \cap (B \cap C)$

4 The lengths of two transverse tangents to a pair of circle is:

Ⓐ Over-lapping Ⓑ Parallel
Ⓒ Unequal Ⓓ Equal

5 Identity $(5x + 4)^2 = 25x^2 + 40x + 16$ is true for:

Ⓐ One value of x Ⓑ Two values of x
Ⓒ Three values of x Ⓓ All values of x

6 $\alpha^2 + \beta^2 =$ --------:

Ⓐ $\alpha^2 - \beta^2$ Ⓑ $\frac{1}{\alpha^2} + \frac{1}{\beta^2}$
Ⓒ $(\alpha + \beta)^2 - 2\alpha\beta$ Ⓓ $\alpha + \beta$

7 The tangents drawn at the ends of diameter of circle are ---- to each other.

Ⓐ Parallel Ⓑ Non-parallel
Ⓒ Collinear Ⓓ Perpendicular

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8 Two linear factors of $x^2 - 15x + 56$ are:

Ⓐ $(x + 7)$ & $(x + 8)$ Ⓑ $(x - 7)$ & $(x + 8)$
Ⓒ $(x + 8)$ & $(x + 7)$ Ⓓ $(x - 7)$ & $(x - 8)$

9 The third proportional of x^2 and y^2 is:

Ⓐ $\frac{y^2}{x^2}$ Ⓑ x^2y^2
Ⓒ $\frac{y^4}{x^2}$ Ⓓ $\frac{y^2}{x^3}$

10 The quadratic formula of $ax^2 + bx + c = 0$ is:

Ⓐ $\frac{b \pm \sqrt{b^2 - 4ac}}{2a}$ Ⓑ $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Ⓒ $\frac{b \pm \sqrt{b^2 + 4ac}}{2a}$ Ⓓ $\frac{-b \pm \sqrt{b^2 + 4ac}}{2a}$

11 The number of elements in power set of {1, 2, 3} is:

Ⓐ 8 Ⓑ 6
Ⓒ 4 Ⓓ 2

12 An arc subtended a central angle of 40° then the corresponding chord will subtend central angle of -------:

Ⓐ 20° Ⓑ 40°
Ⓒ 60° Ⓓ 80°

13 The measure that determines the middle most observation in a data set is called:

Ⓐ Median Ⓑ Mode
Ⓒ Mean Ⓓ Geometric mean

14 The square roots of unity are:

Ⓐ 1, –1 Ⓑ 1, ω
Ⓒ 1, –ω Ⓓ ω, ω^2

15 A complete circle is divided into:

Ⓐ 90° Ⓑ 360°
Ⓒ 270° Ⓓ 180°

Mathematics	Tenth, 2025 Lahore Board	Group – I
Time: 2.10 hrs.	Subjective	Marks : 60

PART – I

Q.2 **Write short answers to any SIX (6) questions:** 12

i. Define with an example, the exponential equation

ii. Solve by factorization: $x^2 - x - 20 = 0$

iii. Write the quadratic equation in standard form. $\frac{x}{x+1} + \frac{x+1}{x} = 6$

iv. Find the nature of roots of equation: $x^2 - 23x + 120 = 0$

v. Evaluate: $\left(\frac{-1+\sqrt{-3}}{2}\right)^9 + \left(\frac{-1-\sqrt{-3}}{2}\right)^9$

vi. Find the sum and product of roots of quadratic equation $(\ell + m)x^2 + (m + n)x + n - \ell = 0$

vii. What is meant by joint variation?

viii. If the ratios $3x + 1 : 6 + 4x$ and $2 : 5$, are equal find the value of x.

ix. Find the third proportional to: $a^3 : 3a^2$

Q.3 **Write short answers to any SIX (6) questions:** 12

i. If $\frac{7x-25}{(x-4)(x-3)} = \frac{A}{x-4} + \frac{B}{x-3}$, then find A and B.

ii. Define improper fraction and give example.

iii. If X = {2,4,6, ----, 20} and Y = {4,8,12,----,24} then find X–Y.

iv. Define an onto function.

v. If B={–1, 3} then find B × B.

vi. Write De Morgan's laws.

vii. Find arithmetic mean by direct method:
12, 14, 17, 20, 24, 29, 35, 45

viii. Define geometric mean.

ix. Find the median of the given data:
2.9, 2.7, 2.5, 1.9, 2.3, 3.1

Q.4 **Write short answers to any SIX (56) questions:** 12

i. Locate the angle -120°.

ii. Find ℓ, when $\theta = 60^\circ\ 30'$, r = 15mm.

iii. Convert into single trigonometric function: $\sin^2 x \cot^2 x$

iv. Convert $\frac{3\pi}{4}$ radians to degree

v. Define segment of circle

vi. Differentiate between minor arc and major arc of a circle.

vii. Define central angle of circle.

viii. Construct a circle of radius 2 cm.

ix. Define inscribed circle.

PART – II

Note: Attempt THREE questions in all.
But question No. 9 is Compulsory.

Q.5(a) Solve the equation: $2x + 5 = \sqrt{7x+16}$ 4

(b) Find the value of 'h' using synthetic division if '1' is the zero of the polynomial $x^3 - 2hx^2 + 11$ 4

Q.6(a) Using theorem of componendo-dividendo, find the value of $\frac{x-3y}{x+3y} - \frac{x+3z}{x-3z}$ if $x = \frac{3yz}{y-z}$ 4

(b) Resolve into partial fractions: $\frac{x^2+1}{x^3+1}$ 4

Q.7(a) If U = {1, 2, 3, ----, 10}, A={1, 3, 5, 7, 9}, B = {2, 3, 4, 5, 8} then prove that $(A \cup B)' = A' \cap B'$ 4

(b) Compare the variation about mean for the two groups: 4

A	60	70	30	90	80	40
B	62	62	65	68	67	48

Q.8(a) Verify the identity: $\frac{1+\sin\theta}{1-\sin\theta} - \frac{1-\sin\theta}{1+\sin\theta} = 4\tan\theta\sec\theta$ 4

(b) Inscribe a square in a given circle of radius 3 cm. 4

Q.9 Prove that two chords of a circle which are equidistant from the centre, are congruent. 8

OR

Prove that any two angles in the same segment of a circle are equal.