Mathematics (Science)	Tenth, 2025 Lahore Board	Group – II
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 $\sec^2\theta = ----$:

Ⓐ $1+\tan^2\theta$ Ⓑ $1-\sin^2\theta$
Ⓒ $1+\cos^2\theta$ Ⓓ $1-\tan^2\theta$

2 In a ratio a: b, a is called:

Ⓐ Relation Ⓑ Consequent
Ⓒ Antecedent Ⓓ Proportion

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

Ⓐ 4 Ⓑ 6
Ⓒ 8 Ⓓ 9

4 Angle inscribed in a semicircle is:

Ⓐ $\frac{\pi}{2}$ Ⓑ $\frac{\pi}{3}$
Ⓒ $\frac{\pi}{4}$ Ⓓ $\frac{\pi}{6}$

5 $\frac{2x+1}{(x+1)(x-1)}$ is ---:

Ⓐ A proper fraction Ⓑ An equation
Ⓒ An improper fraction Ⓓ A constant term

6 Cube roots of –1 are:

Ⓐ $1,-\omega,-\omega^2$ Ⓑ $-1,-\omega,\omega^2$
Ⓒ $-1,-\omega,-\omega^2$ Ⓓ $-1,\omega,-\omega^2$

7 A line which has only one point in common with a circle is called:

Ⓐ Sine of a circle Ⓑ Cosine of a circle
Ⓒ Tangent of a circle Ⓓ Secant of a circle

8 The number of methods to solve a quadratic equation is:

Ⓐ 3 Ⓑ 2
Ⓒ 1 Ⓓ 4

9 Find x in proportion 4 : x : : 5 :15 :

Ⓐ $\frac{75}{4}$ Ⓑ 12
Ⓒ $\frac{4}{3}$ Ⓓ $\frac{3}{4}$

10 The solution set of equation $4x^2 - 36 = 0$ is:

Ⓐ {3} Ⓑ {±3}
Ⓒ {4} Ⓓ {±4}

11 A set with no element is called:

Ⓐ Subset Ⓑ Empty set
Ⓒ Singleton set Ⓓ Super set

12 A pair of chords of a circle subtending two congruent central angles is:

Ⓐ Incongruent Ⓑ Parallel
Ⓒ Over-lapping Ⓓ Congruent

13 A frequency polygon is a many sided:

Ⓐ Triangles Ⓑ Rectangle
Ⓒ Square Ⓓ Closed figure

14 If $b^2 - 4ac < 0$, then the roots of $ax^2 + bx + c = 0$ are:

Ⓐ Rational Ⓑ Real
Ⓒ Irrational Ⓓ Imaginary

15 The distance of any point of the circle to its centre is called:

Ⓐ Diameter Ⓑ Radius
Ⓒ A chord Ⓓ An arc

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Time: 2.10 hrs.	Subjective	Marks : 60

PART – I

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

i. Solve by factorization: $5x^2 = 15x$

ii. Solve: $\sqrt{3x+18} = x$

iii. Define reciprocal equation and write one example.

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

v. Prove that the sum of the all cube roots of unity is zero.

vi. Evaluate : $(1-\omega+\omega^2)^6$

vii. Define proportion and give one example.

viii. Find x if 6 : x : : 3 : 5

ix. If x and y^2 varies directly and x = 27, y = 4, find the value of k.

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

i. Define rational fraction and write example.

ii. Resolve into proper fraction: $\dfrac{3x^2-2x-1}{x^2-x+1}$

iii. Write De Morgan's law.

iv. If A={1,3,5,7}, B={2,3,5,7} then prove commutative property of union.

v. If U = {1, 2, 3, ----10}, A = {2, 3, 5, 7} and B = {3, 5, 8}, find A′ and B′.

vi. Find the domain and range of R={(a,b), (b,a), (c,d), (d,e)}

vii. Define standard deviation.

viii. Write formula for finding the mode of grouped data.

ix. Find the range: 11500, 12400, 15000, 14500, 14800

Q.4 Write short answers to any SIX (6) questions: 12

i. A flag pole 17.9 m high casts a 7 meter shadow. Find the angles of elevation of the sun.

ii. Convert $\dfrac{-7\pi}{8}$ radians to degree measure.

iii. Find r when ℓ = 52 cm and θ = 45°.

iv. Verify: $\dfrac{\sin^2\theta}{\cos\theta} + \cos\theta = \sec\theta$

v. How would you explain the concept of zero dimension briefly?

vi. Differentiate between a chord and an arc of a circle.

vii. Define circum angle.

viii. Define escribed circle.

ix. The length of the side of a regular pentagon is 5 cm. What is its perimeter?

PART – II

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

Q.5(a) Solve the equation : $5^{1-x} + 5^{1-x} = 26$ 4

(b) The difference of a number and its reciprocal is $\dfrac{15}{4}$. Find the number. 4

Q.6(a) Using theorem of componendo-dividendo, solve the equation: $\dfrac{\sqrt{x+3}+\sqrt{x-3}}{\sqrt{x+3}-\sqrt{x-3}} = \dfrac{4}{3}$ 4

(b) Resolve into partial fractions: $\dfrac{7x+4}{(3x+2)(x+1)^2}$ 4

Q.7(a) If U = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}, A = {1,3,5,7,9}, B = (2,3,5,7) then prove that $(A \cap B)' = A' \cup B'$ 4

(b) Find standard deviation for the data: 4

9, 3, 8, 8, 9, 8, 9, 18

Q.8(a) The point (–3, 4) lies on terminal side of θ. Find the quadrant of θ and all six trigonometric ratios. 4

(b) Circumscribe a circle with regard to a right angle triangle with sides 3 cm, 4 cm and 5 cm. 4

Q.9 Prove that one and only one circle can pass through three non-collinear points. 8

OR

Prove that the measure of a central angle of a minor arc of a circle, is double that of angle subtended by corresponding major arc.