

MODEL PAPER MATHEMATICS CLASS 10

NOTE: Attempt all questions of Section-A by filling the corresponding bubble on the **MCQs RESPONSE SHEET**. It is mandatory to return the attempted MCQs sheet to the Superintendent within given time.

SECTION –A

Time: 20 Minutes

Marks: 15

1. The quadratic equation in the following is:

A. $x^4 + 11x^2 + 9 = 0$

B. $x^3 + 11x^2 + 9 = 0$

C. $x^3 + 11x + 9 = 0$

D. $x^2 + 11x + 9 = 0$

2. The solution set of $2x^2 - 9x + 5 = 0$ is:

A. $\left\{\frac{-9 \pm \sqrt{41}}{4}\right\}$

B. $\left\{\frac{9 \pm \sqrt{41}}{4}\right\}$

C. $\left\{\frac{-9 \pm \sqrt{41}}{2}\right\}$

D. $\left\{\frac{-9 \pm \sqrt{41}}{2}\right\}$

3. $\frac{1}{\alpha} + \frac{1}{\beta} =$

A. $\frac{1}{\alpha\beta}$

B. $\frac{1}{\alpha+\beta}$

C. $\frac{\alpha\beta}{\alpha+\beta}$

D. $\frac{\alpha+\beta}{\alpha\beta}$

4. The discriminant of equation $x^2 + 6x + 2 = 0$ is equal to:

A. 8

B. 28

C. 36

D. 44

5. Direct variation between p and q can be expressed as:

A. $p = q$

B. $p = \frac{1}{q}$

C. $p \propto q$

D. $p \propto \frac{1}{q}$

Result.pk

6. In continued proportion $p:q = q:r$, r is called as:
- A. first proportional to p, q .
 - B. second proportional to p, q .
 - C. third proportional to p, q .
 - D. fourth proportional to p, q .
7. $\frac{x^2+1}{x+1}$ is an example of:
- A. proper fraction only
 - B. improper fraction only
 - C. both proper and rational fraction
 - D. both improper and irrational fraction
8. The set of the whole numbers (W) in the following is:
- A. $\{0, 1, 2, 3, \dots \dots \dots\}$
 - B. $\{0, \pm 2, \pm 4, \dots \dots \dots\}$
 - C. $\{1, 2, 3, \dots \dots \dots\}$
 - D. $\{0, \pm 1, \pm 2, \pm 3, \dots \dots \dots\}$
9. The range of $R = \{(1,2), (2,2), (3,1), (4,4)\}$ is:
- A. $\{1, 3, 4\}$
 - B. $\{1, 2, 4\}$
 - C. $\{2, 3, 4\}$
 - D. $\{1, 2, 3, 4\}$
10. If $A = \{1, 2, 3, 4\}$ and $B = \{5, 6, 7, 8\}$, then which of the following binary relations is a function from B to A ?
- A. $R = \{(1,5), (2,6), (3,7), (4,8)\}$
 - B. $R = \{(1,6), (2,5), (4,8), (4,7)\}$
 - C. $R = \{(5,1), (6,2), (7,3), (8,4)\}$
 - D. $R = \{(5,2), (6,1), (8,4), (8,3)\}$
11. The value that appears more times in a data is called:
- A. mean
 - B. median
 - C. mode
 - D. variance
12. In the given set of data, 71, 73, 79, 77, 76, 75, 80, the median is:
- A. 73
 - B. 76
 - C. 77
 - D. 79

13. In radians, 45° is equal to:

A. $\frac{\pi}{2}$

B. $\frac{\pi}{3}$

C. $\frac{\pi}{4}$

D. $\frac{\pi}{6}$

14. $1 + \cot^2\theta =$

A. $\sin^2\theta$

B. $\cos^2\theta$

C. $\tan^2\theta$

D. $\operatorname{cosec}^2\theta$

15. The number of circles that can pass through three non-collinear points is:

A. 0

B. 1

C. 2

D. 3

Result.pk

SECTION-B

Time: 2 Hours 40 Minutes

Marks: 36

1. Attempt any **NINE** of the following short questions. Each question carries 4 marks.
- i. Derive quadratic formula for $ax^2 + bx + c = 0$ where $a \neq 0$, by using completing square method.
 - ii. Solve $4 \cdot 2^{2x} - 10 \cdot 2^x + 4 = 0$.
 - iii. Find the cube roots of 64.
 - iv. If α, β are roots of $x^2 - 4x + 2 = 0$, find the equation whose roots are $\frac{\alpha}{\beta}, \frac{\beta}{\alpha}$.
 - v. Find the mean proportional of $a^2 - b^2$ and $\frac{a+b}{a-b}$.
 - vi. Resolve into partial fraction $\frac{4x+2}{(x+2)(2x-1)}$.
 - vii. If $U = \{1,2,3, \dots, 10\}$, $A = \{2,4,6,8,10\}$ and $B = \{1,3,5,7,9\}$, then verify $(A \cup B)' = A' \cap B'$.
 - viii. A set of data contains the values as 105,80,90,75,100,105 and 110. Show that $Mode > Median > Mean$.
 - ix. An arc of a circle subtends an angle of 2 radians at the center. If the area of sector formed is 64cm^2 , find the radius of the circle.
 - x. Prove that: $\cos x - \cos x \sin^2 x = \cos^3 x$.
 - xi. \overline{AB} and \overline{AC} are tangent segments to the circle with centre O . If $m\overline{OB} = 6\text{cm}$ and $m\overline{OA} = 10\text{cm}$, then find $m\overline{AB}$ and $m\overline{AC}$.
 - xii. Prove that equal chords of a circle subtend equal angles at the center. Prove for only one circle.

SECTION-C

Marks: 24

NOTE: Attempt any **THREE** of the following questions. Each question carries 8 marks.

2. In $\triangle ABC$, $m\overline{AB} = 8\text{cm}$, $m\overline{BC} = 12\text{cm}$, $m\angle B = 100^\circ$. The projection of \overline{BC} on \overline{AB} is 6cm . Find $m\overline{AC}$.
3. Prove that If two chords of a circle are congruent then they will be equidistant from the center.
4. Prove that the angle in a semi-circle is a right angle.
5. Construct a triangle with sides 4 cm, 4.5 cm and 5 cm. Also draw its circumcircle.