



10TH SSC MCQ - CH - QUADRATIC EQUATIONS

DATE: _____

TIME: 38 Min

MARKS: 38

SEAT NO: _____

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Note:-

1. All Questions are compulsory.
2. Numbers on the right indicate full marks.

Q.1 The product of the roots $\alpha\beta =$ _____ (1)

- A) $\frac{-b}{a}$ B) $\frac{-c}{a}$
C) $\frac{b}{a}$ D) $\frac{c}{a}$

Ans : D

Q.2 The quadratic equation $2x^2 - \sqrt{5x} + 1 = 0$ has _____ (1)

- A) Real roots B) No real roots
C) Both a & b D) None of this

Ans : C

Q.3 Values of k for which the quadratic equation $2x^2 - kx + k = 0$ has equal roots is _____ (1)

- A) 0 only B) 4
C) 8 D) 0, 8

Ans : D

Q.4 Which of the following equations has 2 as a root? (1)

- A) $x^2 - 4x + 5 = 0$ B) $x^2 + 3x - 12 = 0$
C) $2x^2 - 7x + 6 = 0$ D) $3x^2 - 6x - 2 = 0$

Ans : C

Q.5 Which of the following is a quadratic equation? (1)

- A) $x^2 + 2x = 1 = (4 - x)^2 + 3$ B) $x^2 - x^2 = (x - 1)^3$
C) $(k + 1)x^2 + \frac{3}{2}x = 7$ D) $-2x^2 = (5 - x)(2x - \frac{2}{5})$

Ans : C

Q.6 If $2 + \sqrt{3}$ is a root of a quadratic equation $x^2 + px + q = 0$ then the values of p and q (1)

- _____
- A) (4, -1) B) (4, 1)
C) (-4, 1) D) (2, 3)

Ans : C

Q.7 If α and β are the roots of the equation $x^2 - 5x + 6 = 0$ then the equation with roots $(\alpha + \beta)$ and $(\alpha - \beta)$ is _____ (1)

- A) $x^2 - 6x + 5 = 0$ B) $2x^2 - 6x + 5 = 0$
C) $2x^2 - 5x + 6 = 0$ D) $x^2 - 5x + 6 = 0$

Ans : A

Q.8 If $\frac{1}{2}$ is a root of the equation $x^2 + kx - \frac{5}{4} = 0$ then value of k is _____ (1)

- A) 2 B) $\frac{1}{2}$
C) $-\frac{1}{2}$ D) -2

Ans : A

Q.9 The sum of the roots of the quadratic equation $3x^2 - 9x + 5 = 0$ _____ (1)

- A) 3 B) 6
C) -3 D) 2

Ans : A

Q.10 The equation $2x^2 + kx + 3 = 0$ has equal roots then the value of k is _____ (1)

- A) $\sqrt{6}$ B) 4
C) $3\sqrt{2}$ D) $2\sqrt{6}$

Ans : D

Q.11 The roots of the quadratic equation $6x^2 - x - 2 = 0$ are _____ (1)

- A) $\frac{2}{3}, \frac{1}{2}$ B) $-\frac{2}{3}, \frac{1}{2}$
C) $\frac{2}{3}, -\frac{1}{2}$ D) $-\frac{2}{3}, -\frac{1}{2}$

Ans : C

Q.12 What is the solution of the quadratic equation $2x^2 - 7x + 6 = 0$? (1)

- A) $-\frac{3}{2}, 2$ B) $\frac{3}{2}, 2$
C) $-2, \frac{3}{2}$ D) $2, \frac{2}{3}$

Given quadratic equation is $2x^2 - 7x + 6 = 0$

$$2x^2 - 4x - 3x + 6 = 0$$

$$2x(x - 2) - 3(x - 2) = 0$$

$$x - 2 = 0 \text{ Or } 2x - 3 = 0$$

$$x = 2 \quad \text{Or } x = \frac{3}{2}$$

\therefore Solution set $(\frac{3}{2}, 2)$

Ans : B

Q.13 Which of the following is a quadratic equation? (1)

- A) $6x^2 = 20 - x^3$ B) $x^2 (\frac{1}{2} - 2) = \frac{7}{2}$
C) $\frac{3}{x} - 3 = 4x^2$ D) $5x + 7 = 3x$

$$x^2 \left(\frac{1}{2} - 2 \right) = \frac{7}{2}$$

$$x - 2x^2 = \frac{7}{2}$$

$$2x - 4x^2 = 7$$

$$4x^2 - 2x + 7 = 0$$

Here x is the only variable and maximum index of the variable is 2

∴ It is quadratic equation.

Ans : B

Q.14 The value of discriminant for quadratic equation $2x^2 - 7x - 3 = 0$ is _____ (1)

A) 23 B) -73

C) 73 D) 49

Ans : B

Q.15 Which of the following equation quadratic equation ? (1)

A) $13 = -5y^2 - y^3$ B) $(x + 3) + (x - 5) = 0$

C) $x + 3x = 5$ D) $x^2 + \frac{1}{2} = 2x$

Ans : B

Q.16 What are the value of a,b and c for the quadratic equation $2x^2 - 5x - 3 = 0$ (1)

Ans : C

Q.17 State which root of the following $x^2 - 4x + 3 = 0$ equation. (1)

A) 8 B) 1

C) -4 D) 0

Ans : B

Q.18 What is the value of K, if one root of the quadratic equation $x^2 + kx + 10 = 0$ is 2? (1)

A) 7 B) 14

C) -7 D) -14

Ans : C

Q.19 One of the roots of equation $x^2 + mx - 5 = 0$ is 2 ; find m. (1)

A) -2 B) $-\frac{1}{2}$

C) $\frac{1}{2}$ D) 2

$$x^2 + m(x) - 5 = 0$$

$$\therefore (2)^2 + 2m - 5 = 0$$

$$\therefore 2m - 1 = 0$$

$$\therefore 2m = 1$$

$$\therefore m = \frac{1}{2}$$

Ans : C

Q.20 Out of the following equations which one is not a quadratic equation? (1)

- A) $x^2 + 4x = 11 + x^2$ B) $x^2 = 4x$
C) $5x^2 = 90$ D) $2x - x^2 = x^2 + 5$

$$x^2 + 4x = 11 + x^2$$

$$\therefore x^2 - x^2 + 4x - 11 = 0$$

$$\therefore 4x - 11 = 0 \text{ is a linear equation.}$$

Ans : A

Q.21 Given equation is the quadratic equation? (1)

- A) $\frac{5}{x} - 3 = x^2$ B) $x(x + 5) = 2$
C) $n - 1 = 2n$ D) $\frac{1}{x^2} + (x + 2) = x$

Ans : B

Q.22 $\sqrt{5}m^2 - \sqrt{5}m + \sqrt{5} = 0$ which of the following statement is true for this given equation? (1)

- A) Real and unequal roots B) Real and equal roots
C) Roots are not real D) Three roots

$$(b^2 - 4ac)(-5)^2 - 4 \times \sqrt{5} \times \sqrt{5} = 5 - 20 = -15$$

Ans : C

Q.23 Which of the following quadratic equations has roots 3, 5? (1)

- A) $x^2 - 15x + 8 = 0$ B) $x^2 - 8x + 15 = 0$
C) $x^2 + 3x + 5 = 0$ D) $x^2 + 8x - 15 = 0$

$$\text{Let } \alpha = 3, \beta = 5$$

$$\therefore x^2 - (3 + 5)x + (3 \times 5)$$

$$\therefore x^2 - 8x + 15 = 0$$

Ans : B

Q.24 For $\sqrt{2}x^2 - 5x + \sqrt{2} = 0$ find the value of the discriminant. (1)

- A) -5 B) 17
C) $\sqrt{2}$ D) $2\sqrt{2} - 5$

$$a = \sqrt{2}, b = -5, c = \sqrt{2}$$

$$\therefore b^2 - 4ac = (-5)^2 - 4 \times \sqrt{2} \times \sqrt{2} = 25 - 8 = 17$$

Ans : B

Q.25 The roots of $x^2 + kx + k = 0$ are real and equal, find k. (1)

- A) 0 B) 4
C) 0 or 4 D) 2

$$\Delta = 0$$

$$b^2 - 4ac = 0$$

$$k^2 - 4k = 0$$

$$k(k - 4) = 0$$

$$k = 4 \text{ or } k = 0$$

Ans : C

Q.26 Out of the following equations, find the equation having the sum of its roots -5 (1)

A) $3x^2 - 15x + 3 = 0$ B) $x^2 - 5x + 3 = 0$

C) $x^2 + 3x - 5 = 0$ D) $3x^2 + 15x + 3 = 0$

Ans : B

Q.27 Determine discriminant of given equation $2y^2 + 11y - 7 = 0$ (1)

A) 122 B) -177

C) 177 D) -122

Given equation is $2y^2 + 11y - 7 = 0$

Here, $a = 2$, $b = 11$ $c = -7$

$$D = b^2 - 4ac$$

$$= 11^2 - 4 \times 2 \times -7$$

$$= 121 + 56$$

$$= 177$$

Ans : C

Q.28 What are the roots of $x^2 + 3x + 2 = 0$ (1)

A) -1, -2 B) 1, 2

C) -1, 2 D) 1, -2

Given quadratic equation $x^2 + 3x + 2 = 0$

$$x^2 + 2x + x + 2 = 0$$

$$x(x + 2) + 1(x + 2) = 0$$

$$(x + 2)(x + 1) = 0$$

$$x + 2 = 0 \text{ Or } x + 1 = 0$$

$$x = -2 \text{ Or } x = -1$$

Ans : A

Q.29 Write the given quadratic equation in standard form $x + \frac{1}{x} = 4$ (1)

A) $x^2 - 4x + 1 = 0$ B) $x^2 + 4x - 1 = 0$

C) $x^2 - 4x - 1 = 0$ D) $x^2 - 4x = 40$

Given quadratic equation $x + \frac{1}{x} = 4$

Multiplying throughout by x

$$x^2 + 1 = 4x$$

$$x^2 - 4x + 1 = 0$$

Ans : A

Q.30 Roots of the quadratic equation are _____ for $9x^2 - 81 = 0$ (1)

A) -7, 6

B) 6, -6

C) 3, -3

D) 9, -9

$$9x^2 - 81 = 0$$

$$9(x^2 - 9) = 0$$

$$x^2 - 9 = 0$$

$$(x + 3)(x - 3) = 0$$

$$x + 3 = 0 \text{ Or } x - 3 = 0$$

$$x = -3 \text{ or } x = 3$$

Ans : C

Q.31 If $\alpha + \beta = -2$, $\alpha\beta = -35$ then quadratic equation is _____ (1)

A) $x^2 + 2x + 35 = 0$ B) $x^2 - 2x - 35 = 0$

C) $x^2 + 2x - 35 = 0$ D) $x^2 - 36 = 0$

$\alpha + \beta = -2$, $\alpha\beta = -35$ is given, then quadratic equation is,

$$x^2 - (\alpha + \beta)x + \alpha\beta = 0$$

$$x^2 - (-2)x + (-35) = 0$$

$$x^2 + 2x - 35 = 0$$

Ans : C

Q.32 Find root of given equation $x^2 - 4x + 3 = 0$ (1)

A) 8

B) 1

C) -4

D) 0

When $x = 1$

$$\text{L.H.S} = (1)^2 - 4(1) + 3$$

$$= 1 - 4 + 3$$

$$= -3 + 3$$

$$= 0$$

$$= \text{R.H.S}$$

\therefore Root of the given equation is 1

Ans : B

Q.33 Roots of quadratic equation $y^2 - 5y - 24 = 0$ are _____. (1)

A) -3, -8

B) -3, 8

C) 3, -8

D) 3, 8

$$y^2 - 5y - 24 = 0$$

$$y^2 - 8y + 3y - 24 = 0$$

$$y(y - 8) + 3(y - 8) = 0$$

$$(y - 8)(y + 3) = 0$$

$$y - 8 = 0 \text{ Or } y + 3 = 0$$

$$y = 8 \text{ Or } y = -3$$

\therefore Roots are -3 and 8

Ans : B

Q.34 Find $\alpha\beta$ for quadratic equation $6y^2 + 17y + 12 = 0$ (1)

A) -2 B) 3

C) 2 D) -3

Comparing $6y^2 + 17y + 12 = 0$ with $ax^2 + bx + c = 0$

We get, $a = 6, b = 17, c = 12$

$$\alpha\beta = \frac{c}{a} = \frac{12}{6} = 2$$

Ans : C

Q.35 $9p^2 - 5p - 4 = 0$ for this equation $\alpha + \beta =$ _____. (1)

A) $\frac{5}{9}$ B) $-\frac{5}{9}$

C) $\frac{4}{9}$ D) $-\frac{4}{9}$

Comparing $9p^2 - 5p - 4 = 0$ with $ax^2 + bx + c = 0$

We get $a = 9, b = -5$ and $c = 4$

$$\alpha + \beta = \frac{-b}{a} = \frac{-(-5)}{9} = \frac{5}{9}$$

Ans : A

Q.36 If $\alpha = -7$ and $\beta = -3$ the quadratic equation is _____. (1)

A) $x^2 - 10x - 21 = 0$ B) $x + 10x + 21 = 0$

C) $x^2 - 10x + 21 = 0$ D) $x^2 + 10x + 21 = 0$

$$\alpha = -7 \text{ and } \beta = -3$$

$$\alpha + \beta = -7 - 3 = -10$$

$$\alpha\beta = -7 \times -3 = 21$$

The quadratic equation ,

$$x^2 - (\alpha + \beta)x + \alpha\beta = 0$$

$$x^2 - (-10)x + 21 = 0$$

$x^2 + 10x + 21 = 0$ is required quadratic equation.

Ans : D

Q.37 What is nature of the roots of the quadratic equation $9x^2 + 6x + 1 = 0$ (1)

A) Real and equal B) Not real

C) Real and unequal D) None of these

Comparing the given quadratic equation with $ax^2 + bx + c = 0$ we get,
 $a = 9, b = 6, c = 1$

$$\begin{aligned}b^2 - 4ac &= (6)^2 - 4 \times 9 \times 1 \\ &= 36 - 36 \\ &= 0\end{aligned}$$

\therefore The roots of given quadratic equation are real and equal.

Ans : A

Q.38 Which of the following is one root of the quadratic equation $x^2 - 7x + 10 = 0$? (1)

- A) 7 B) 5
C) -7 D) -1

Given quadratic equation is $x^2 - 7x + 10 = 0$
Let $x = 7$

$$\begin{aligned}\text{L.H.S} &= 7^2 - 7(7) + 10 \\ &= 49 - 49 + 10 \\ &= 10 \\ &\neq \text{R.H.S}\end{aligned}$$

Let $x = 5$

$$\begin{aligned}\text{L.H.S} &= 5^2 - 7(5) + 10 \\ &= 25 - 35 + 10 \\ &= -10 + 10 \\ &= 0 \\ &= \text{R.H.S}\end{aligned}$$

\therefore 5 is the root of given quadratic equation.

Ans : B