SHIKSHA CLASSES

Sub. : Maths. | **Question Paper** | **Total Marks : 30**
Std. X (CBSE) | **4 : Quadratic equations.** | **Time : 1 hour**

Section : A (Each 1 Mark)

Multiple choice Questions (MCQs).

Q.1 : Every quadratic polynomial can have at most

a) three zeros b) one zero c) two zeros d) None of these

Q.2 : If $x^2 + 5px + 16$ has no real roots, then

a) $p > \frac{8}{5}$ b) $\frac{-8}{5} < p < \frac{8}{5}$ c) $p < \frac{-8}{5}$ d) None of these

Q.3 : For $ax^2 + bx + c = 0$, which of the following statement is wrong?

a) If $b^2 - 4ac$ is a perfect square, the roots are rational.

b) If $b^2 = 4ac$, the roots are real and equal.

c) If $b^2 - 4ac$ is negative, no real roots exist.

d) If $b^2 = 4ac$, the roots are real and unequal.

Q.4 : Positive value of p for which equation $x^2 + px + 64 = 0$ and $x^2 - 8x + p = 0$ will both have real roots will be

a) $p \geq 16$ b) $p \leq 16$ c) $p = 16$ d) None of these

Q.5 : If equation $9x^2 + 6px + 4 = 0$ has equal roots, then both roots are equal to

a) $\pm\frac{2}{3}$ b) ± 3 c) $\pm\frac{3}{2}$ d) 0

Q.6 : The equation $(x - 2)^2 + 1 = 2x - 3$ is a

a) linear equation b) quadratic equation

c) cubic equation d) bi-quadratic equation

Q.7 : The quadratic equation whose one rational root is $3 + \sqrt{2}$ is

a) $x^2 - 7x + 5 = 0$ b) $x^2 + 7x + 6 = 0$

c) $x^2 - 7x + 6 = 0$ d) $x^2 - 6x + 7 = 0$

Q.8 : The equation $2x^2 + kx + 3 = 0$ has two equal roots, then the value of k is

a) $\pm\sqrt{6}$ b) ± 4 c) $\pm 3\sqrt{2}$ d) $\pm 2\sqrt{6}$

Q.9 : The value of $\sqrt{6 + \sqrt{6 + \sqrt{6}.....}}$ is.

a) 4 b) 3 c) 3.5 d) –3

For question number 10 to 11 two statements are given one labeled Assertion and other labeled Reason select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below

a) If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

b) If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

c) If Assertion is correct but Reason is incorrect.

d) If Assertion is incorrect but Reason is correct.

Q.10 : **Assertion:** If one root of the quadratic equation $6x^2 - x - k = 0$ is 2/3, then the value of k is 2.

Reason: The quadratic equation $ax^2 + bx + c = 0$, $a \neq 0$ has almost two roots.

Q.11 : **Assertion:** The roots of the quadratic equation $x^2 + 2x + 2 = 0$ are imaginary.

Reason: If discriminant $D = b^2 - 4ac < 0$ then the roots of quadratic equation $ax^2 + bx + c = 0$ are imaginary.

Section : B (Each 2 Marks)

Q.12 : Solve the equation :

$$\frac{3}{x+2} - \frac{1}{2} = \frac{2}{3x-1}; x \neq -2, x \neq \frac{1}{3} \text{ for x.}$$

Q.13 : Solve : $x^2 + \left(\frac{a}{a+b} + \frac{a+b}{a}\right)x + 1 = 0$

OR

Solve the quadratic equation for $x : 2x^2 + 6\sqrt{3}x - 60 = 0$.

Section : C (Each 3 Marks)

Q.14 : Seven years ago Varun's age was five times the square of Swati's age. Three years hence. Swati's age will be two fifth of Varun's age find their present ages.

Q.15 : Solve : $9x^2 - 9(a + b)x + (2a^2 + 5ab + 2b^2) = 0$.

OR

Find the value of k for which the quadratic equation $(k + 1)x^2 - 6(k + 1)x + 3(k + 9) = 0$, $k \neq -1$ has equal roots. Hence find the roots of the equation.

Section - D(Each 5 Marks)

Q.16 : Sum of the areas of two squares is 640 m^2. If the difference of their perimeters is 64 m find the sides of the two squares.

OR

A shopkeeper buys a number of books for ₹ 80 If he had bought 4 more books for the same amount, each book would have cost ₹ 1 less. How many books did he buy?

Section : E

Q.17 : Case Study :

Distance and Speed : A passenger is waiting for his flight at an airport. But due to bad weather conditions, his flight got delayed by 40 minutes. In order to reach the destination on time, which is 1600 km away, an aeroplane has to increase its speed by 400 km/h from its usual speed. (Let usual speed be x km/h).

i) Find the expression for the time taken by the plane to cover 1600 km with its increased speed. 1

ii) Find the usual speed of the plane. 2

OR

Manoj when increases his speed from 24 km/h to 30 km/h he takes 1 hour less than the usual time to cover a certain distance. What is the distance usually covered by Manoj?

iii) If the usual speed of the plane is 750 km/h, then find the time taken by the plane to cover 2250 km distance. 1

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