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परमाणु ऊर्जा शिक्षा संस्था , मुंबई

Atomic Energy Education Society, Mumbai

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Class: X

Subject: MATHEMATICS

WORKSHEET NO.- 1

Name of the Chapter : QUADRATIC EQUATIONS (CHAPTER – 4)

General Instructions:

1. There are 5 sections in this worksheet.
2. Section – A has 10 multiple choice questions of 1 mark each.
3. Section – B has 10 very short answer questions of 1 mark each.
4. Section – C has 10 short answer questions of 2 marks each.
5. Section – D has 5 short answer questions of 3 marks each.
6. Section – E has 5 long answer questions of 5 marks each.
7. Draw neat diagrams wherever necessary.
8. Use of calculator is not permitted

Section A

- 1 The product of two successive integral multiples of 5 is 1050. Then the numbers are [1]
a) 25 and 35
b) 25 and 30
c) 30 and 35
d) 35 and 40
- 2 Which of the following has no real root? [1]
a) $x^2 - 5x + 3\sqrt{2} = 0$
b) $x^2 + 4x - 3\sqrt{2} = 0$
c) $x^2 - 4x - 3\sqrt{2} = 0$
d) $x^2 - 4x + 3\sqrt{2} = 0$
- 3 $5x^2 + 8x + 4 = 2x^2 + 4x + 6$ is a [1]
a) quadratic equation

b) cubic equation

c) constant

d) linear equation

4 If the product of the roots of the equation $x^2 - 3x + k = 10$ is -2 then the value of k is **[1]**

a) -8

b) 12

c) -2

d) 8

5 Which of the following equations has the sum of its roots as 3 ? **[1]**

a) $-x^2 + 3x - 3 = 0$

b) $\sqrt{2}x^2 - \frac{3}{\sqrt{2}}x + 1 = 0$

c) $2x^2 - 3x + 6 = 0$

d) $3x^2 - 3x + 3 = 0$

6 If one root of the equation $2x^2 + ax + 6 = 0$ is 2 then $a = ?$ **[1]**

a) -7

b) $\frac{7}{2}$

c) $-\frac{7}{2}$

d) 7

7 $9x^2 + 12x + 4 = 0$ have **[1]**

a) Real and Distinct roots

b) No real roots

c) Distinct roots

d) Real and Equal roots

8 In a cricket match, Kumble took three wickets less than twice the number of wickets taken by Srinath. The product of the number of wickets taken by these two is 20 , then the number of wickets taken by Kumble is **[1]**

- a) 4
 b) 5
 c) 10
 d) 2
- 9 A quadratic equation $ax^2 + bx + c = 0$, has coincident roots, if [1]
 a) $b^2 - ac = 0$
 b) $b^2 - 4ac$
 c) $b^2 - 4ac$
 d) $b^2 - 4ac = 0$
- 10 The roots of the equation $2x^2 - 6x + 3 = 0$ are [1]
 a) real, unequal and irrational
 b) real and equal
 c) real, unequal and rational
 d) imaginary

Section - B

- 11 If one root of the quadratic equation $.2x^2 + 2x + k = 0$ is $-\frac{1}{3}$, then find the value of K. [1]
- 12 Find the solution of the quadratic equation $3\sqrt{3}x^2 + 10x + \sqrt{3} = 0$ [1]
- 13 State whether $(2x + 1)(3x + 2) = 6(x - 1)(x - 2)$ is a quadratic equation or not? [1]
- 14 State whether $3x^2 - 5x + 9 = x^2 - 7x + 3$ is a quadratic equation or not? [1]
- 15 Solve quadratic equation by factorization method: $x^2 + 2\sqrt{2}x - 6 = 0$ [1]
- 16 Determine the nature of the roots of the quadratic equation: $x^2 + x + 1 = 0$. [1]
- 17 Find the nature of the roots of the quadratic equation $4x^2 + 4\sqrt{3}x + 3 = 0$. [1]
- 18 Solve the quadratic equation by factorization: $(2x + 3)(3x - 7) = 0$ [1]
- 19 Comment upon the nature of root of the quadratic equation: $4x^2 + 7x + 2 = 0$. [1]
- 20 If 1 is a root of the equation $ay^2 + ay + 3 = 0$ and $y^2 + y + b = 0$ then find the value of ab. [1]

Section - C

- 21 Find the least positive value of k for which the equation $x^2 + kx + 4 = 0$ has real roots. [2]
- 22 Find the values of k for which the following equation has equal roots: $(k - 12)x^2$ [2]

$$+ 2(k - 12)x + 2 = 0$$

- 23 Determine the set of values of k for which the following quadratic equation have real roots: $2x^2 + kx + 2 = 0$ [2]
- 24 Represent the following situations in the form of Quadratic Equations: [2]
1. The area of rectangular plot is 528 m^2 . The length of the plot (in metres) is one more than twice its breadth. We need to find the length and breadth of the plot.
 2. The product of two consecutive numbers is 306. We need to find the integers.
- 25 Solve the quadratic equation by factorization: $48x^2 - 13x - 1 = 0$ [2]
- 26 The sum of two numbers is 16. The sum of their reciprocals is $\frac{1}{3}$. Find the numbers. [2]
- 27 Check whether $x^2 + 3x + 1 = (x - 2)^2$ is a quadratic equation. [2]
- 28 Solve the equation: $3x^2 - 8x - 1 = 0$ for x . [2]
- 29 Determine the nature of the roots of quadratic equation: $3\sqrt{3}x^2 + 10x + \sqrt{3} = 0$ [2]
- 30 Find that non-zero value of k , for which the quadratic equation $kx^2 + 1 - 2(k - 1)x + x^2 = 0$ has equal roots. Hence find the roots of the equation. [2]

Section - C

- 31 If the price of a book is reduced by ₹ 5, a person can buy 4 more books for ₹ 600. Find the original price of the book. [3]
- 32 A piece of cloth costs ₹ 35. If the piece were 4 m longer and each metre costs ₹ one less, the cost would remain unchanged. How long is the piece? [3]
- 33 Find roots of given quadratic equation: $p^2x^2 + (p^2 - q^2)x - q^2 = 0, p \neq 0$ [3]
- 34 Find three consecutive positive integers whose product is equal to sixteen times their sum. [3]
- 35 A takes 10 days less than the time taken by B to finish a piece of work. If both A and B together can finish the work in 12 days, find the time taken by B to finish the work. [3]

Section - D

- 36 If (-5) is a root of the quadratic equation $2x^2 + px + 15 = 0$ and the quadratic equation $p(x^2 + x) + k = 0$ has equal roots, then find the values of p and k . [5]
- 37 A cottage industry produces a certain number of toys in a day. The cost of production of each toy (in rupees) was found to be 55 minus the number of toys produced in a day. On a particular day, the total cost of production was ₹ 750. We would like to find out the number of toys produced on that day. Represent the situations mathematically (quadratic equation). [5]
- 38 At t minutes past 2 p.m, the time needed by the minute hand of a clock to show 3 p.m. was found to be 3 minutes less than $\frac{t^2}{4}$ minutes. Find t . [5]

39 Solve: $\frac{1}{x-2} + \frac{2}{x-1} = \frac{6}{x}; x \neq 0,1,2$ [5]

40 The sum of squares of two consecutive multiples of 7 is 637. Find the multiples. [5]