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PRACTICE PAPER 01 - CHAPTER 04 QUADRATIC EQUATIONS (2025-26)

SUBJECT: MATHEMATICS **MAX. MARKS : 40**

CLASS : X **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.

(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.

(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.

(iv). There is no overall choice.

(v). Use of Calculators is not permitted

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. What is/are the roots of $3x^2 = 6x$?

(a) Only 2 (b) Only 3 (c) 0 and 6 (d) 0 and 2

2. The nature of roots of the quadratic equation $9x^2 - 6x - 2 = 0$ is:

(a) No real roots (b) 2 equal real roots

(c) 2 distinct real roots (d) More than 2 real roots

3. The roots of the equation $x^2 + 3x - 10 = 0$ are:

(a) 2, –5 (b) –2, 5 (c) 2, 5 (d) –2, –5

4. Which of the following are the roots of the quadratic equation, $x^2 - 9x + 20 = 0$?

(a) 3, 4 (b) 4, 5 (c) 5, 6 (d) 6, 7

5. If the roots of equation $3x^2 + 2x + (p + 2)(p - 1) = 0$ are of opposite sign then which of the following cannot be the value of p?

(a) 0 (b) – 1 (c) $\frac{1}{2}$ (d) – 3

6. The value of k for which the equation $x^2 + 2(k + 1)x + k^2 = 0$ has equal roots is

(a) – 1 (b) $-\frac{1}{2}$ (c) 1 (d) none of these

7. The value(s) of k for which the quadratic equation $2x^2 + kx + 2 = 0$ has equal roots, is

(a) 4 (b) ± 4 (c) – 4 (d) 0

8. Which of the following is not a quadratic equation?

(a) $2(x - 1)^2 = 4x^2 - 2x + 1$ (b) $2x - x^2 = x^2 + 5$

(c) $(\sqrt{2}\,x + \sqrt{3})^2 + x^2 = 3x^2 - 5x$ (d) $(x^2 + 2x)^2 = x^4 + 3 + 4x^3$

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

9. Assertion (A): The roots of the quadratic equation $x^2 + 2x + 2 = 0$ are not real

Reason (R): If discriminant $D = b^2 - 4ac < 0$ then the roots of quadratic equation $ax^2 + bx + c = 0$ are not real.

10. Assertion (A): The value of k = 2, if one root of the quadratic equation $6x^2 - x - k = 0$ is 2/3.

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

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. For what value of k, does the quadratic equation $x^2 - kx + 4 = 0$ have equal roots?

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

13. If 2 is a root of the equation $x^2 + kx + 12 = 0$ and the equation $x^2 + kx + q = 0$ has equal roots, find the value of q.

14. Solve the quadratic equation: $x^2 - 2ax + (a^2 - b^2) = 0$ for x.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Solve the following for x : $\frac{1}{2a+b+2x} = \frac{1}{2a} + \frac{1}{b} + \frac{1}{2x}$

16. The sum of two numbers is 34. If 3 is subtracted from one number and 2 is added to another, the product of these two numbers becomes 260. Find the numbers.

17. 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, find the value of k.

SECTION – D

Questions 18 carry 5 marks.

18. In a class test, the sum of Arun's marks in Hindi and English is 30. When he got 2 marks more in Hindi and 3 marks less in English, the product of the marks would have been 210. Find his marks in the two subjects.

OR

In a flight of 600 km, an aircraft was slowed due to bad weather. Its average speed for the trip was reduced by 200 km/hr and time of flight increased by 30 minutes. Find the original duration of flight.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Case Study-1 : John and Jivanti are playing with the marbles. They together have 45 marbles. Both of them lost 5 marbles each, and the product of the number of marbles they now have is 124.

(a) Find the quadratic equation related to the given problem (2)

(b) Find the Number of marbles John had. (2)

20. Case Study-2 : Generally, new methods such as aquaponics Raised-bed gardening raised beds and cultivation under glass are used. Marketing can be done locally in farmers markets, traditional markets or farmers can contract their whole crops to wholesalers, canners or retailers.

A farmer wishes to grow a 100 m^2 rectangular vegetable garden. Since he has with the only 30 m barbed wire, he fences three sides of the rectangular garden letting compound wall of his house act as the fourth side-fence.

(a) Represent given problem in quadratic form. (2)

(b) Find the length of the vegetable garden. (1)

(c) If length of the vegetable garden is 5 m, then find the breadth. (1)