PRACTICE PAPER

ICSE CLASS 10 – MATHEMATICS

Chapter 6 : Solving Simple Problems

(Based on Quadratic Equations)

Maximum Marks: 40 ***Time allowed: One and a half hours***

1. *Answers to this Paper must be written on the paper provided separately.*
2. *You will not be allowed to write during the first 10 minutes. This time is to be spent in reading the question paper.*
3. ***The time given at the head of this Paper is the time allowed for writing the answers.***
4. *Attempt* ***all*** *questions from* ***Section A*** *and* ***any two*** *questions from* ***Section B****.*
5. ***All working, including rough work, must be clearly shown, and must be done on the same sheet as the rest of the answer.***
6. ***Omission of essential working will result in loss of marks.***
7. *The intended marks for questions or parts of questions are given in brackets [ ].*
8. *In word problems, form the equation in terms of a suitable variable, solve it, and reject any root that is not admissible.*

SECTION A (20 Marks)

*(Attempt **all** questions from this Section.)*

Question 1

Choose the correct answers to the questions from the given options. [8]

(Do not copy the question, write the correct answers only.)

(i) The sum of a positive number and its square is 56. The number is:

(a) 6
(b) 7
(c) 8
(d) −8

(ii) The length of a rectangle is 3 m more than its breadth and its area is 70 m². The breadth of the rectangle is:

(a) 5 m
(b) 7 m
(c) 10 m
(d) 14 m

(iii) The sides of a right-angled triangle are x cm, (x + 1) cm and (x + 2) cm. The value of x is:

(a) 1
(b) 2
(c) 3
(d) 5

(iv)

Assertion (A): The equation $x^2 - 2x - 8 = 0$ gives the length x cm of a rectangle as 4 cm.

Reason (R): A length cannot be negative, so the negative root of the equation is rejected.

(a) (A) is true and (R) is false.
(b) (A) is false and (R) is true.
(c) Both (A) and (R) are true, and (R) is the correct explanation for (A).
(d) Both (A) and (R) are true, but (R) is not the correct explanation for (A).

(v) The product of two consecutive positive integers is 132. The larger integer is:

(a) 10
(b) 11
(c) 12
(d) 13

(vi) A polygon of n sides has $n(n - 3)/2$ diagonals. If a polygon has 20 diagonals, then n is:

(a) 6
(b) 7
(c) 8
(d) 10

(vii) A train covers 120 km at a speed of x km/h. If the speed is increased by 10 km/h, the time taken (in hours) for the same distance is:

(a) $120/x + 10$
(b) $120/(x + 10)$
(c) $120/x - 10$
(d) $(x + 10)/120$

(viii) **Assertion (A):** The product of two consecutive odd natural numbers is 35, so the numbers are 7 and 9.

Reason (R): If x is an odd number, then the next odd number is $x + 2$.

(a) (A) is true and (R) is false.
(b) (A) is false and (R) is true.
(c) Both (A) and (R) are true, and (R) is the correct explanation for (A).
(d) Both (A) and (R) are true, but (R) is not the correct explanation for (A).

Question 2

(i) Two natural numbers differ by 5 and the sum of their squares is 325. Form a quadratic equation and hence find the numbers. [4]

(ii) A girl is 4 years older than her brother. Three years from now, the product of their ages will be 192. Find their present ages. [4]

(iii) The perimeter of a rectangular plot is 46 m and its diagonal is 17 m. Taking the length as x m, form a quadratic equation in x and solve it to find the length and breadth of the plot. [4]

SECTION B (20 Marks)

*(Attempt **any two** questions from this Section.)*

Question 3

(i) The product of two consecutive multiples of 3 is 270. Find the numbers. [3]

(ii) The denominator of a fraction is 3 more than its numerator. If 2 is added to both the numerator and the denominator, the fraction increases by $\frac{2}{21}$. Find the original fraction. [3]

(iii) The age of a man is 3 years more than five times the age of his son. The product of their ages (in years) is 198. Find their present ages. [4]

Question 4

(i) Working together, two taps A and B can fill a tank in 6 hours. Tap A alone takes 5 hours less than tap B alone to fill the tank. Find the time taken by each tap alone. [3]

(ii) A bus covers a distance of 200 km at a uniform speed. Had its speed been 10 km/h more, it would have taken 1 hour less for the same journey. Find the original speed of the bus. [3]

(iii) The speed of a motorboat in still water is 10 km/h. It takes 1 hour more to travel 24 km upstream than to travel the same distance downstream. Find the speed of the stream. [4]

Question 5

(i) In a right-angled triangle, the hypotenuse is 1 cm longer than the longer of the other two sides, and the shorter side is 7 cm shorter than the longer side. Find the lengths of all three sides. [3]

(ii) A rectangular park measures 30 m by 20 m. A path of uniform width runs all around the park on the outside. The area of the path is 336 m². Find the width of the path. [3]

(iii) The area of a rectangular floor is 120 m². If its length is decreased by 3 m and its breadth is increased by 2 m, the area remains unchanged. Taking the length of the floor as x m, form an equation in x and find the dimensions of the floor. [4]

Question 6

(i) A shopkeeper buys an article for ₹ x and sells it for ₹ 96, gaining as much percent as the cost price of the article. Find the cost price. [3]

(ii) In a two-digit number, the product of the digits is 15. If 18 is subtracted from the number, the digits get interchanged. Find the number. [3]

(iii) A group of friends hired a vehicle for ₹ 3000 and decided to share the cost equally. Five of them did not turn up, so the share of each remaining friend increased by ₹ 20. Taking the original number of friends as x, form an equation in x and find x. [4]

— End of Question Paper —