Case Study 2

During the annual school fair, Class 7 students of Knowledge Park School set up a stationery stall to raise funds. The stall sold notebooks and pens. Each notebook had a fixed price of Rs.40, while the price of one pen was not mentioned clearly. Let the cost of one pen be represented by the variable x rupees.

One afternoon, Aarav bought 4 notebooks and 6 pens from the stall. He paid a total amount of Rs.340. The students managing the stall wanted to find the cost of one pen so that they could display the correct price for other buyers.

First, they discussed the meaning of variables and constants. The number 40 was a constant, while x was a variable representing the unknown cost of a pen. They formed a simple linear equation using the given information and solved it step by step using a systematic method. Some students also tried solving the equation by trial and error.

After finding the value of x, they verified the solution by substituting it back into the equation. The teacher explained how such simple equations are useful in daily life for shopping, budgeting, and solving word problems involving unknown quantities.

Questions

1. What does the variable x represent in the case study?

    A. Cost of one notebook
    B. Total amount paid
    C. Cost of one pen
    D. Number of pens bought

2. Which of the following equations correctly represents the given situation?

    A. $4x + 6 = 340$
    B. $40 + 6x = 340$
    C. $4(40 + x) = 340$
    D. $4 \times 40 + 6x = 340$

3. What is the value of x obtained by solving the equation?

    A. Rs.20
    B. Rs.30
    C. Rs.25
    D. Rs.40

4. Which of the following shows the first correct step in solving the equation systematically?

    A. $160 + 6x = 340$
    B. $6x = 180$
    C. $x = 30$
    D. $40 + 6x = 340$

5. How can the value of x be verified?

    A. By forming a new equation
    B. By guessing another value
    C. By substituting x in the original equation
    D. By changing the constants

Answer Key

1. **C**

   Explanation: The variable x represents the unknown cost of one pen in rupees.

2. **D**

   Explanation: Cost of 4 notebooks $= 4 \times 40 = 160$ rupees. Cost of 6 pens $= 6x$ rupees. Total cost equation: $160 + 6x = 340$.

3. **B**

   Explanation: Solving $160 + 6x = 340$: $6x = 340 - 160 = 180$ $x = \frac{180}{6} = 30$. Hence, the cost of one pen is Rs.30.

4. **A**

   Explanation: The first step is to calculate the constant part: $4 \times 40 = 160$, giving the equation $160 + 6x = 340$.

5. **C**

   Explanation: Verification is done by substituting $x = 30$ into the original equation and checking whether both sides are equal.