

## SAMPLE PAPER 4: PAPER 1

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### QUESTION 3 (25 MARKS)

#### Question 3 (a)

$$2x - y + 3z = 20 \dots (1)$$

$$7x + y + z = 23 \dots (2)$$

$$3x + y - z = 3 \dots (3)$$

$$(1) + (2) : 9x + 4z = 43 \dots (4)$$

$$(2) - (3) : 4x + 2z = 20 \dots (5) (\times -2)$$

$$\begin{array}{r} 9x + 4z = 43 \\ -8x - 4z = -40 \\ \hline x = 3 \end{array}$$

$$27 + 4z = 43$$

$$4z = 16 \Rightarrow z = 4$$

$$6 - y + 12 = 20$$

$$\therefore y = -2$$

**ANSWER:** (3, -2, 4)

#### Question 3 (b)

$$(2 - 3k)x^2 + (4 - k)x + 2 = 0$$

$$\text{No real roots: } b^2 - 4ac < 0$$

$$(4 - k)^2 - 4(2 - 3k)(2) < 0$$

$$16 - 8k + k^2 - 16 + 24k < 0$$

$$k^2 + 16k < 0$$

$$k(k + 16) < 0$$

$$k(k + 16) = 0 \Rightarrow k = -16, 0$$

**ANS:**  $-16 < k < 0$