

$$i) \{x : x^2 - 2x - 3 = 0\}$$

$$\Rightarrow x^2 - 2x - 3 = 0$$

$$\Rightarrow x^2 - 3x + x - 3 = 0$$

$$\Rightarrow x(x-3) + 1(x-3) = 0$$

$$\Rightarrow (x+1)(x-3) = 0$$

Either

$$\Rightarrow x+1=0$$

$$x-3=0$$

$$\Rightarrow x = 0-1 \quad \text{OR} \quad \Rightarrow x = 0+3$$

$$\Rightarrow x = -1 \quad \quad \quad \Rightarrow x = 3$$

∴ The elements of this set are -1 or 3

$$ii) \{x : x = 2y + 5; y \in \mathbb{N} \text{ and } 2 \leq y < 6\}$$

$$y \in \mathbb{N} \text{ and } 2 \leq y < 6 = 2, 3, 4, 5$$

$$\text{∴ } x = 2 \times 2 + 5, 2 \times 3 + 5, 2 \times 4 + 5, 2 \times 5 + 5$$
$$= 9, 11, 13, 15$$

∴ When  $y = 2$

$$x = 2 \times 2 + 5$$

$$= 9$$

When  $y = 4$

$$x = 2 \times 4 + 5$$

$$= 13$$

∴ When  $y = 3$

$$x = 2 \times 3 + 5$$

$$= 11$$

When  $y = 5$

$$x = 2 \times 5 + 5$$

$$= 15$$

∴ ∴ The elements of the given set  $\{x : x = 2y + 5; y \in \mathbb{N} \text{ and } 2 \leq y < 6\}$  are 9, 11, 13, 15

vi)  $\{m, n\}$

"PERMANENT"

$$2) P = \{p : P \text{ is a letter in the word } "PERMANENT"\}$$

$$\text{OR } P = \{p, e, n, m, a, n, t\}$$

$$n(P) = 7$$

$$3) i) A = \{x : x \in Z \text{ and } x < 10\}$$

$$= \{\dots, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$$

= It is an infinite set.

$$ii) B = \{x : x \in W \text{ and } 5x - 3 < 20\}$$

$$5x - 3 < 20$$

$$5x - 3 + 3 < 20 + 3 \text{ (Adding 3 to both sides)}$$

$$5x < 20 + 3$$

$$5x < 23$$

$$x < \frac{23}{5} \text{ Dividing}$$



i) ~~MURUT = m~~  
 $MURUT = \{m, u, r, u, t\}$

$$\text{UNIVERSAL} = \{u, n, i, v, e, r, s, a, l\}$$

$$A = \{x : y+3, y \in \mathbb{N} \text{ and } y > 3\}$$

$$y \in \mathbb{N} \text{ and } y > 3 = 4, 5, 6, 7, \dots$$

$$\begin{aligned} \text{In roster form} &= \{4+3, 5+3, 6+3, 7+3, \dots\} \\ &= \{7, 8, 9, 10, \dots\} \end{aligned}$$

$$B = \{p : p \in \mathbb{N} \text{ and } p^2 < 20\}$$

$$p \in \mathbb{N} \text{ and } p^2 < 20 = 0^2, 1^2, 2^2, 3^2, 4^2$$

$$p \Rightarrow \{0, 1, 2, 3, 4\}$$

$$C = \{x : x \text{ is a composite number and } 5 \leq x$$

$$x \text{ is a composite number and } 5 \leq x < 21 = \{6, 12, 14, 15, 16, 18\}$$