1) Given the unversal set = $\{-7, -3, -1, 0, 5, 6, 8, 9\}$ Find

$A = \{x : x < 2\}$

$B = \{x : -4 < x < 6\}$

→ universal set = $\{-7, -3, -1, 0, 5, 6, 8, 9\}$

$A = \{x : x = 3p ; p \in \mathbb{N}\}$

$B = \{y : y = 2n + 3, n \in \mathbb{N}\}$

$C = \{x : x \text{ is divisible by 9}\}$

$A = \{x : x < 2\} = \{-7, -3, -1, 0\}$

$B = \{x : -4 < x < 6\} = \{-3, -1, 0, 5\}$

Q5) Given the universal set = $\{x : x \in N$ and $x < 20\}$ find:
(i) $A = \{x : x = 3p, p \in N\}$
(ii) $B = \{y : y - 2n + 3, n \in N\}$
(iii) $C = \{x : x$ is divisible by $4\}$

Ans → universal set = $\{x : x \in N$ and $x < 20\}$
$= \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 \dots 19\}$
(i) $A = \{x : x = 3p, p \in N\}$
$\qquad x = 3p$
when $p = 1$, $\qquad\qquad x = 3 \times 1 = 3$
when $p = 2$, $\qquad\qquad x = 3 \times 2 = 6$
when $p = 3$, $\qquad\qquad x = 3 \times 3 = 9$
when $p = 4$, $\qquad\qquad x = 3 \times 4 = 12$
when $p = 5$, $\qquad\qquad x = 3 \times 5 = 15$
when $p = 6$, $\qquad\qquad x = 3 \times 6 = 18$
$\therefore A = \{3, 6, 9, 12, 15, 18\}$
(ii) $B = \{y : y = 2n + 3, n \in N\}$
$\qquad y = 2n + 3$

Q6) Find the proper subsets of $\{x : x^2 - 9x - 10 = 0\}$.
Ans → $x^2 - 9x - 10 = 0$
$\Rightarrow x^2 - 10x + x - 10 = 0$
$\Rightarrow x(x-10) + 1(x-10) = 0$
$\Rightarrow (x-10)(x+1) = 0$
$\therefore$ Either $x - 10 = 0$ or $x + 1 = 0$
$\qquad x = 10$
$\qquad \Rightarrow x = -1$
$\qquad$ Given set $= \{-1, 10\}$
$\qquad$ proper subset of this set $= \phi, \{-1\}, \{10\}$

Q7) Given A = $\{$Triangles$\}$ B = $\{$isosceles triangles$\}$ State
$\qquad$ whether the following are true or false. Give reasons.

(i) $A \subset B$ (ii) $B \subset A$

(iii) $C \subset B$ (iv) $B \subset A$

(v) $C \subset A$ (vi) $C \subset B \subset A$

Ans-7 $A = \{Triangles\}$

$\qquad B = \{Isosceles\ triangles\}$

$\qquad C = \{Equilateral\ triangles\}$

(i) Since each triangle is not isosceles.

$\therefore A \subset B$ False

(ii) $B \subset A$ True

$\therefore$ Isosceles Δ is one of the triangles.

(iii) Since each equilateral triangle is isosceles also,

$\therefore C \subset B$ True

(iv) $B \subset A$ True

$\therefore$ isosceles Δ is one of the triangles.

(v) $C \subset A$ True

$\therefore$ Equilateral Δ is one of the triangles.

(vi) $C \subset B \subset A$ True

$\therefore$ Each equilateral triangle is isosceles also and each isosceles Δ is a form of triangle.

Q8) Given, $A = \{quadrillaterials\}$, $B = \{Rectangles\}$, $C = \{squares\}$, $D = \{Rhombuses\}$ State., giving reasons whether the following are true or false.

Ans→ $A = \{quadrillaterials\}$

$\qquad B = \{Rectangles\}$

$\qquad C = \{square\}$

$\qquad D = \{Rhombuses\}$

(i) $B \subset C$ is a False

$\therefore$ Rectangle is not a square also.

(ii) $D \subset B$ is a False

Rhombus is not a rectangle also.

$C \subseteq B \subseteq A$ True

Every square is a rectangle also and every rectangle is a quadrilateral also

$D \subseteq C \subseteq A$ True

Rhombus is one of the quadrilateral.

$B \supset C$ True

Square is a rectangle also.

$A \supseteq B \supseteq D$ False

Rhombus is not a rectangle also.