Ex - 13C

1 Fill in the blanks

(i) If each element of set P is also an element of set Q, then P is said to be subset of Q and Q is said to be super set of P.

i) Every set is a subset of itself.

i) The empty set is a subset of every set.

v) If A is proper subset of B, then n(A) is less than n(B)

2 If $A = \{5, 7, 8, 9\}$, then which of the following are subset of A?

i) $B = \{5, 8\}$
s $B \subset A$

(ii) $C = \{0\}$
Ans $C \not\subset A$

(iii) $D = \{7, 9, 10\}$
Ans $D \not\subset A$

iv) $\phi = \{\}$
ns $\phi \subset A$

(v) $F = \{8, 7, 9, 5\}$
Ans $F \subset A$

Hence (i), (iv) and (v) are subset of A.

3 If $P = \{2, 3, 4, 5\}$; then which of the following are proper subset of P?

Ans: P = {2, 3, 4, 5}

(i) A = {3, 4},

(iii) B = {},

C = {23, 45},

D = {6, 5, 4} and

$\mathcal{E}$ = {0}

We see that only A and B are the proper subset of P.

4 If A = {even numbers less than 12},

B = {2, 4}, C = {1, 2, 3}, D = {2, 6} and

$\mathcal{E}$ = {4}

State which of the following statement are true:

Ans (i) A = {even number less than 12} = {2, 4, 6, 8, 10}

B = {2, 4}, C = {1, 2, 3}

D = {2, 6} and $\mathcal{E}$ = {4}

(i) $B \subset A$.
Ans True

(ii) $C \subset A$
Ans False

(iii) $D \subset C$
Ans False

(iv) $D \not\subset A$
Ans True

(v) $\mathcal{E} \supseteq B$
Ans False

(vi) $A \supseteq B \supseteq \mathcal{E}$
Ans True

5 Given $A = \{a, c\}$, $B = \{p, q, r\}$ and C = Set of digits used to form the number 1351. Write all the subset of sets A, B and C

Ans(i) $A = \{a, c\}$

∴ subsets are : $\{\}$ or ϕ, $\{a\}$, $\{c\}$ and $\{a, c\}$

(ii) $B = \{p, q, r\}$

∴ subsets are : $\{\}$ or ϕ, $\{p\}$, $\{q\}$, $\{r\}$, $\{p, q\}$, $\{p, r\}$, $\{q, r\}$ and $\{p, q, r\}$

(iii) C = Set of digits used in 135, = $\{1, 3, 5\}$

∴ subsets are = $\{\}$ or ϕ, $\{1\}$, $\{3\}$, $\{5\}$, $\{1, 5\}$, $\{2, 5\}$ and $\{1, 3, 5\}$.

(i) If $A = \{p, q, r\}$, then number of subsets of A =

Ans If $A = \{p, q, r\}$

then number of subsets of $A = 2^3 = 2 \times 2 \times 2 = 8$

(ii) If $B = \{5, 4, 6, 8\}$, then number of subsets of B = ____

Ans If $B = \{5, 4, 6, 8\}$,

then number of ~~subsets~~ proper subsets of B = $2^4 - 1 = 2 \times 2 \times 2 \times 2 - 1 = 16 - 1 = 15$

(ii) If $C = \{0\}$, then number of subsets of C = ____

Ans ~~Then~~ If $C = \{0\}$

then number of subsets of $C = 2^1 = 2$

(v) If $M = \{x : x \in N \text{ and } x < 3\}$, then M has ____ proper subsets.

Ans If $M = \{x : x \in N \text{ and } x < 3\}$, $= \{1, 2\}$
Then M has proper subsets $= 2^2 - 1 = 4 - 1 = 3$

7 For the universal set $\{4, 5, 6, 7, 8, 9, 10, 11, 13\}$, find its subsets A, B, C and D such that:

(i) $A = \{$ even number $\}$
Ans $\{4, 6, 8, 10, 12\}$

(ii) $B = \{$ odd number greater than $8\}$
Ans $\{9, 11, 13\}$

(iii) $C = \{$ Prime number $\}$
Ans $\{5, 7, 11, 13\}$

(iv) $D = \{$ even numbers less than $10\}$
Ans $\{4, 6, 8\}$