Work Sheet- 1 for class- Ten
Chapter - One
Exercise - 1.1
Set and Function

Creative Multiplication Choice Questions

1. **If $A \cap B = \emptyset$, $n(A) = 2$ and $n(A \cup B) = 10$ then $n(B)$ = What? [D.B.- 20]**

a) 2 b) 6
c) 8 d) 10

2. **For the set $A_n = \{n, 2n, 3n\ldots\ldots\}$ [D.B.- 20]**

i. $A_1 \sim A_1$
ii. $A_1 \sim A_2$
iii. $A_1 \sim A_3$

Which one of the following is correct?

a) i and ii b) i and iii
c) ii and iii d) i, ii and iii

3. **How many members are there of the power set of A = {a, b, c, 4, 5}? [My.B.- 20]**

a) 5 b) 10
c) 16 d) 32

4. **If $A = \{x \in \mathbb{R}: -2 \leq x < 1\}$ and $B = \{x \in \mathbb{R}: 1 \leq x < 3\}$ then which set is $P(A \cap B)$? [Dj.B.- 20]**

a) {1} b) $\emptyset$
c) {0} d) $\{\emptyset\}$

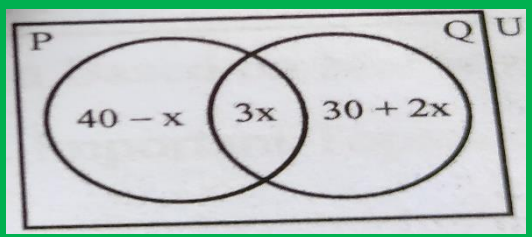
5. **If $A = \{x \in \mathbb{N}: 4x < 20\}$ then which one is the number of subsets of A? [C.B.- 20]**

a) 32 b) 16
c) 8 d) 4

6. **$A = \{x: x \in \mathbb{R}$ and $1 \leq x \leq 2\}$ and $B = \{x: x \in \mathbb{N}$ and $0 < x < 1\}$ then $P(A \cap B)$ = What? [Ctg.B.- 20]**

a) $\emptyset$ b) $\{\emptyset\}$
c) $\{\{1\}, \{2\}\}$ d) $\{\emptyset, \{1\}, \{2\}\}$

7.



If $\cup = P \cup Q$ and $n(\cup) = 90$ then using Venn diagram find the value of $P \setminus Q$. [J.B.- 20]

a) 15 b) 20
c) 35 d) 50

8. **If the elements of any set are 3n then what is elements of its subset? [B.B.- 20]**

a) 2^n b) 3^n
c) 6^n d) 8^n

9. **For which of following the sets A and B will be equal? [D.B.– 19]**

a) $A \setminus B$ and $B \setminus A$
b) $A \notin B$ and $B \notin A$
c) $A \subseteq B$ and $B \subseteq A$
d) $A \nsubseteq B$ and $B \nsubseteq A$

10. **$A = \{x \in z: 9 \leq x^2 \leq 36\}$ then how many subsets of A? [R.B.– 19]**

a) 4 b) 16
c) 32 d) 64

11. **If $A = \{x: x \in N, 5 \leq x < 10\}$ then what is the number of elements of P(A)? [Dj.B.– 19]**

a) 16 b) 31
c) 32 d) 64

12. **If $A \subset B$ then which one of the following is correct? [C.B.– 19, D.B.- 17]**

a) $B \cup A = A$ b) $B \cap A = B$
c) $A \cap B = A$ d) $A' \subset B'$

13. **For any subset P and Q of a universal set U if $P \subset Q$ then which one is correct? [Ctg.B.– 19]**

a) $P' \subset Q'$ b) $P \cap Q = P$
c) $P' \cup Q' = Q'$ d) $P \cup Q = P$

14. **Which one of the following is to be written down instead of $x \in (A \setminus B)$? [J.B.– 19]**

a) $x \in A$ and $x \in B$
b) $x \in A$ and $x \notin B$
c) $x \notin A$ and $x \in B$
d) $x \notin A$ and $x \notin B$

15. **If $A = \{a, b\}$ and $B = \{0\}$ then find of $A \cap B$ = What? [B.B.– 19]**

a) $\{0, a, b\}$ b) $\{a, b\}$
c) $\{0\}$ d) $\{\}$

16. **If A = {1, 2, 3, 4, 5} then what is the number of elements of P(A)?**

[All B.- 18]

a) 5 b) 16
c) 31 d) 32

17. If $n(A) = 3, n(B) = 4$ and $A \cap B = \emptyset$ then $n(A \cup B)$ = What?
[D.B.- 17, C.B.- 15]

a) 3 b) 4
c) 7 d) 12

18. If A is any subset of the universal set U then what is the value of A\(A\A)?
[Dj.B.- 17]

a) A' b) A
c) $\emptyset$ d) {0}

19. If n(M) = 7, n(N) = 4 and $n(M \cap N) = 5$ then $n(M \cup N)$ = What? [C.B.- 17]

a) 2 b) 6
c) 8 d) 16

20. If U is the Universal set and the sets A = {2, 3} and B = {5} then $(A \cap B)'$ is equal to — [J.B.- 17]

a) A b) B
c) $\cup$ d) $A \cup B$

21. If A = {2, 3} and B = {3, 4} then— [B.B.- 17]

i. $P(A) = \{\{2,3\},\{2\},\{3\},\emptyset\}$
ii. $P(B) = \{\{2,4\},\{2\},\{4\},\emptyset\}$
iii. $P(A \cap B) = \{\{3\},\emptyset\}$

Which one of the following is correct?

a) i b) i and ii
c) i and iii d) i, ii and iii

22. Any set A then — [Ctg.B.- 17]

i. Will be an infinite set if and only if A is equivalent to its proper subset.
ii. If the number of the elements are n then $n(P(A)) = 2^n$.
iii. Is a subset of itself?

Which one of the following is correct?

a) i and ii b) i and iii
c) ii and iii d) i, ii and iii

23. Which country belongs to George Cantor? [J.B.- 16]

a) Britain b) Italy
c) France d) Germany

24. If $A \subset B$ then which is the correct of the following? [D.B.- 16]

a) $A \cap B = B$ b) $A \cup B = B$
c) $A \cup B = A$ d) $A \cup B = A \cap B$

25. If $U = \{x : x \in N, x \leq 10\}$, A = {x: $x \in \mathbb{N}$, $x \leq 8$ and x even number}, B = {x: $x \in \mathbb{N}$, x multiples of 3} then $(A \cap B)$ = What? [B.B.- 16]

a) $\emptyset$ b) {6}
c) {6, 8} d) {2, 3, 4, 6, 8}

26. If a member of the set number n then the number of proper subsets is - [B.B.- 16]

a) $2^n + 2$ b) 2^{n+2}
c) $2^n - 1$ d) $2^n - 2$

27. If A = {a, b, c, d, e} then find the elements of P(A) = What? [D.B.– 16]

a) 5 b) 10
c) 25 d) 32

28. If $B = \{x \in N : 6 < 2x < 17\}$ then which of the following is an element of P(B)? [R.B.– 16]

a) 2^3 b) 2^4
c) 2^5 d) $2^4 + 1$

29. How many elements of power set of the set A = {1, 2, 3, 4, 5}? [S.B.– 16]

a) 5 b) 10
c) 25 d) 32

30. If U = {1, 3, 5, 6} and A = {3, 6} then what will be the number of elements of $P(A')$? [C.B.– 16]

a) 1 b) 2
c) 4 d) 8

31. If A = {5, 6, 7} and B = {2, 3} then $(A \cap B)$ = What? [R.B.– 16]

a) {$\emptyset$} b) $\emptyset$
c) {2, 3, 5, 6} d) {0}

32. Among a certain group of students 60 like cricket, 40 like football and 25 like both the game. How many students like at least one of the games? [S.B.– 16]

a) 25 b) 75
c) 100 d) 125

33. If A set has 3 elements then what is the number of proper subsets? [D.B.– 15]

a) 3 b) 6
c) 8 d) 7

34. **If A = {a, b, c, d} then how many elements do P (A) have? [R.B.– 15]**

a) 4 b) 8
c) 16 d) 32

35. **If A' is the complement set of A then $A \cap A'$ = What? [R.B.– 15]**

a) $\cup$ b) $\emptyset$
c) A d) A'

36. **If A = {x: $x^2 - 4 = 0$} and B = {x: $x^2 - x - 6 = 0$} then $A \cap B$ = What? [R.B.– 15]**

a) $\{-2, -3, 2\}$ b) $\{-2\}$
c) $\{-3\}$ d) $\{2\}$

37. **The sets of real numbers, natural numbers, whole numbers and rational numbers are R, N, Z and Q respectively. Which relation suits the best? [C.B.– 15]**

a) $Z \subset Q \subset N \subset R$
b) $N \subset R \subset Q \subset Z$
c) $Q \subset N \subset Z \subset R$
d) $N \subset Z \subset Q \subset R$

38. **Which one in the following is the infinite set? [Ctg.B.– 15]**

a) $\{1, 2, 3, \ldots \ldots \ldots 40\}$
b) $\{3, 4, 7\}$
c) Set of natural numbers
d) $\{x \in N : 2 < x < 12\}$

39. **If $A \cap B = B$ and $A \neq B$ then which one of the following statements is correct? [Ctg.B.– 15]**

a) $A \subset B$ b) $B \subset A$
c) $A \cup B = B$ d) $B \not\subset A$

40. **For any set A under the universal set U then $(A')'$ = What? [S.B.– 15]**

a) $\cup$ b) $\cup \backslash A$
c) A d) $\emptyset$

41. **If A, B, C are three sets then which one is distributive law? [J.B.– 15]**

a) $A \cup B = B \cup A$
b) $A \cup (B \cup C) = (A \cup B) \cup C$
c) $A \cap (B \cap C) = (A \cap B) \cap C$
d) $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$

42. **If $A \subset B$ then — [S.B.- 15]**

i. $A \cup B = B$
ii. $B \backslash A = \emptyset$
iii. $A \cap B = A$

Which one of the following is correct?

a) i and ii b) i and iii
c) ii and iii d) i, ii and iii

43. **If A = {1, 2, 3} and B = {4, 5, 6} then – [Ctg.B.- l5]**

i. $A \cup B = \{x : x \in N \text{ and } x < 7\}$
ii. $A \cap B = \emptyset$
iii. $A \cup B = \{1, 2, 3, 4, 5, 6\}$

Which one of the following is correct?

a) i and ii b) ii and iii
c) i and iii d) i, ii and iii

Creative Questions:

1. **A survey implemented on 100 students of class ten shows that 57 students like Rose, 49 students like Belly and 37 students like Hasna-hena flower. Among them 27 students like Rose and Belly, 23 students like Belly and Hasna-hena, 29 students like both Hasna-hena and Rose flower. 17 students like all that flowers. [B.B.- 19]**

a) Show these data at Venn diagram with short description.
b) How many students does not like any flower of these three? Find it.
c) How many students like only one flower of these three? Find it.

2. **$E = \{x : x \in \mathbb{R} \text{ and } x^2 - (a+b)x + ab = 0, a, b \in \mathbb{R}\}$, $F = \{3, 4\}$ and $G = \{4, 5, 6\}$ [B.B.– 17]**

a) Find the elements of the set E.
b) Prove that, $P(F \cap G) = P(F) \cap P(G)$.
c) Show that, $E \times (F \cup G) = (E \times F) \cup (E \times G)$.

3. **$A = \{x : x \in \mathbb{R} \text{ and } x^2 - (p+q)x + pq = 0, p, q \in \mathbb{R}\}$, $B = \{2, 3\}$ and $C = \{3, 4, 5\}$. [D.B.- 16]**

a) Define subset and complementary set.
b) Show that, $P(B \cap C) = P(B) \cap P(C)$.
c) Prove that, $A \times (B \cup C) = (A \times B) \cup (A \times C)$.

4. **$A = \{x : x \in \mathbb{R}$ and $x^2 - (a+b)x + ab = 0$, where $a, b \in \mathbb{R}\}$, $B = \{2, 3\}$ and $C = \{2, 4, 5\}$. [D.B.- 15]**

a) Determine the components of set A.

b) Show that, $P(B \cap C) = P(B) \cap P(C)$.

c) Prove that, $A \times (B \cup C) = (A \times B) \cup (A \times C)$.

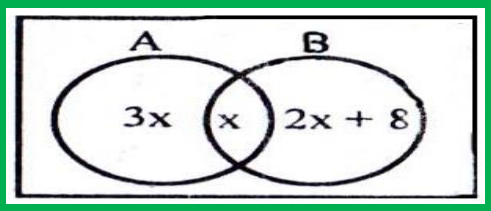
5. **$A = \{x : x \in \mathbb{R}$ and $x^2 - 9x + 20 = 0\}$, B = {5, 6} and C = {x : x is prime number and $6 \leq x \leq 12$}. [Ctg.B.- 15]**

a) Express A in Tabular Method.

b) What is the number of elements of $P(B \cup C)$.

c) Prove that, $P(A) \cap P(B) \neq P(A \cup B)$.

6.



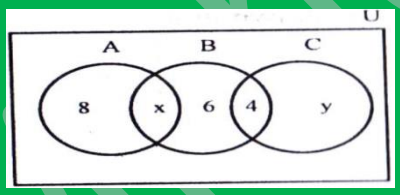
The number of elements of A and B are shown in the Venn Diagram below. If n(A) = n(B) then find out the value of -

a) x

b) $n(A \cup B)$

c) $n(B \backslash A)$

7.



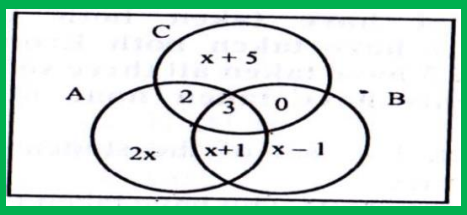
In the following Venn Diagram universal set $U = A \cup B \cup C$.

a) If $n(A \cap B) = n(B \cap C)$ then find the value of x.

b) If $n(B \cup C') = n(A' \cap C)$ then find the value of y.

c) Find the value of n(U).

8.



In the following Venn diagram $U = A \cup B \cup C$ and n(U) = 50.

a) Find the value of x.

b) Find the value of $n(B \cap C')$ and $n(A' \cap B)$.

c) Find the value of $n(A \cap B \cap C')$.

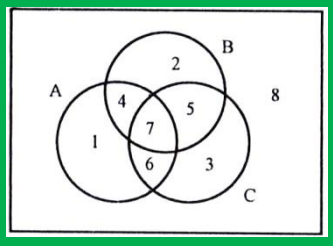
9. **Out of 100 students of a class, 42 students play football, 46 play cricket and 39 play chess. Among them 13 play football and cricket, 14 play cricket and chess and 12 play football and chess. Besides, 7 students are not expert in any these games.**

a) Show the set of students who are expert in the above three games and expert in none of the games in Venn diagram.

b) Find how many students are expert in all three games.

c) How many students are expert in at least one game? How many are expert in just two of the games?

10. **Step-I**



Sep-II. The function $F(x) = \frac{ax + b}{cx + d}$ where $a, b, c \in R$.

a) Represent the set area no. - 7 by the sets A, B, C in the step-I.

b) State and prove "De Morgan's Law" by the sets A, B, C in the step-I

c) Find the domain, range, inverse function and justify the function one-one or onto in step-II.

11. **U is a universal set and A and B are two finite sets which are not disjoint**

a) Express the above information in Venn-diagram.

b) Show that, $n(A \cup B) = n(A) + n(B) - n(A \cap B)$.

c) If $n(A \cup B) = 30$, n(A) = 20 and n(B) = 15 then find $n(A \cap B)$.