SETS, FUNCTIONS AND GROUPS

1) If $x \in L \cup M$, then

A) $x \notin L$ or $x \notin M$
B) $x \notin L$ or $x \in M$
C) $x \in L$ or $x \notin M$
D) $x \in L$ or $x \in M$

2) Let $A = \{a, b, c, d\}$ $B = \{b, c, d\}$ then $A \cap B =$

A) $\{b, c, d\}$
B) $\{a, b, c\}$
C) $\{a, b, c, d\}$
D) $\{a, c, d\}$

3) If $x \in B' = U - B$ then

A) $x \in B$ and $x \in U$
B) $x \notin B$ and $x \in U$
C) $x \notin B$ and $x \notin U$
D) $x \in B$ and $x \notin U$

4) Let $A = (1, 2, 3, 4, 5 \dots)$, $B = \{2, 4, 6, 8 \dots\}$
The $A \cup B$ is

A) $\{1, 2, 3\}$
B) $\{1, 2, 3, 4, 5, \dots\}$
C) $\{2, 4, 6, 8, \dots\}$
D) $\{6, 7, 8, 9\}$

5) $L \cup M = L \cap M$ then L is equal to

A) M
B) L
C) ϕ
D) M'

6) Which of the following sets has only one subset.
A) $\{Y, Z\}$
B) $\{Y\}$
C) $\{0\}$
D) $\{\ \}$

7) $A \subseteq B$ then
A) $A \cap B = A$
B) $A \cap B' = A$
C) $A - B = A$
D) $A - B = B$

8) If $x \in L - M$ then
A) $x \in L$ and $x \in M$
B) $x \in L$ and $x \notin M$
C) $x \notin L$ and $x \in M$
D) $x \notin L$ and $x \notin M$

9) Total number of subsets that can be formed from the set $\{x, y, z\}$ is

A) 1
B) 2
C) 5
D) 8

10) If $x \in L \cap M$ then

A) $x \in L$ and $x \in M$
B) $x \in L$ and $x \notin M$
C) $x \notin L$ and $x \in M$
D) $x \notin L$ and $x \notin M$

11) Let A and B be any none empty sets then $A \cup (A \cap B)$ is

A) $B \cap A$
B) A
C) B
D) $A \cup B$

12) Let A, B, C be any sets. Let $A \cup B = A \cup C$ and $A \cap B = A \cap C$, then B set is equal to

A) $A \cup B$
B) $A \cap B$
C) A
D) C

13) If S contains n elements then power set of S, P (s) contains elements. Which are?

A) 2^n
B) 4^n
C) 5^n
D) 6^n

14) A set is a collection of objects which are

A) well defined
B) well defined and distinct
C) identical
D) not defined

15) The power set of a set S containing six numbers is the set whose elements are

A) three subsets of S
B) two subsets of S
C) five subsets of S
D) all possible subsets of S

16)   A is a subset of B if

A) Every element of A $\in$ B
B) Some element of A $\in$ B
C) Every element of A $\notin$ B
D) Every element of B $\in$ A

17)   The complement of set A relative to universal set U is the set
A) {x/x$\in$U and x $\in$ A}
B) {x/x$\notin$U and x$\notin$A}
C) {x/x$\notin$U and x $\in$ A}
D) {x/x$\in$U and x $\notin$ A}

18)   If A \ B = A then
A) A$\cap$B = A
B) A$\cap$B = A$'$
C) A$\cap$B = B
D) A$\cap$B = ϕ

19)   If B – A = B then
A) A$\cap$B = ϕ
B) A$\cap$B = A
C) A$\cap$B $\neq$ ϕ
D) A$\cap$B = B

20)   The union of the sets A and B is defined as

A) A $\cup$ B = {x/x$\in$A or x$\in$B}
B) A $\cup$ B = {x/x$\notin$A or x$\in$B}
C) A $\cup$ B = {x/x$\notin$A or x$\notin$B}
D) A $\cup$ B = {x/x$\in$A or x$\notin$B}

21)   If Q, R are any sets then Q – R =

A) Q – (Q$\cap$R)
B) Q $\cap$ (Q – R)
C) Q + (Q $\cap$ R)
D) Q – (Q $\cup$ R)

22)   If A and B are any two sets and A$'$ B$'$ are Their compliments relative to the universal set U, the (A$\cup$B)$'$ =
A) A$'$$\cup$B$'$
B) A$\cup$B
C) A$'$$\cap$B$'$
D) A$\cap$B
Answer: C

23)   Difference between two sets A\B is defined as

A) {x/x $\in$ A $\wedge$ x $\in$ B}
B) {x/x $\in$ A $\wedge$ x $\notin$ B}
C) {x/x $\notin$ A $\wedge$ x $\in$ B}
D) {x/x $\notin$ A $\wedge$ x $\notin$ B}

24)   For union Associative Law is

A) (A$\cup$B) $\cup$C = A$\cup$(B$\cup$C)
B) (A$\cup$B) $\cup$C = A$\cap$(B$\cap$C)
C) (A$\cap$B) $\cup$C = A$\cup$(B$\cup$C)
D) (A$\cup$B) $\cup$C = A - (B - C)

25)   The set of odd numbers between 1 and 9 is

A) {1, 3, 5, 7}
B) {3, 5, 7, 9}
C) {1, 3, 5, 7, 9}
D) {3, 5, 7}

26)   The set of rational numbers between 5 and 9 is

A) Finite
B) Infinite
C) {5, 6, 7, 8, 9}
D) {6, 7, 8}

27)   If x is a set having 6 elements then the numbers in P(x) is:
A) 6^2
B) 6
C) 6(2)
D) 2^6

28)   If B $\subseteq$ A then A$'$ is subset of
A) A
B) B
C) B$'$
D) A $\cup$ B

29)   The set A $\cap$ (A $\cup$ B) =
A) A
B) B
C) A $\cup$ B
D) None of these

30)   The set A $\cup$ (A $\cap$ B) =

A) B
B) A
C) A $\cup$ B
D) None of these

31)   If A and B are any two sets and A$'$, B$'$ are their complements relative to the universal set U, then (A $\cap$ B)$'$ =

A) A$'$ $\cup$ B$'$
B) A$'$ $\cap$ B$'$
C) A$'$ $\cup$ B
D) A $\cap$ B$'$

32)   If A $\subseteq$ U then A$'$ relative to U is equal to

A) A – B
B) B – A
C) U – A
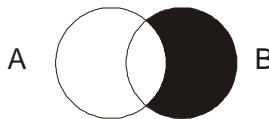D) A – U

33)   The shaded area in the figure represents the set
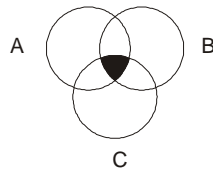
A) $A \cap E \cap C$
B) $A \cup E \cup C$
C) $A \cup E \cap C$
D) $A \cap E \cup C$
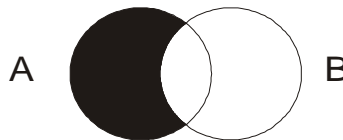
34) The shaded area in the figure represents the set:
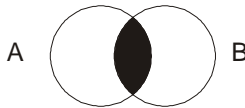
A) $A \cup E$
B) $A \cap E$
C) $A - E$
D) $E - A$

35) The shade area in the figure represents the set:

A) $A \cup E$
B) $A \cap E$
C) $A - E$
D) $E - A$

36) The shaded area in the figure represents the set:

A) $A \cup E$
B) $A \cap E$
C) $A - E$
D) $E - A$

37) Well defined collection of distinct objects is called a _____
A) a function
B) a set
C) a real number
D) none

38) A diagram which represents a set is called _____ diagram.

A) Venn's
B) Argand
C) Plane
D) None

39) If a set A is the subset of B & A $\neq$ B, then A _____ of B.

A) Proper subset
B) Improper subset
C) None   D) None

40) Every set is the _____ of itself.

A) proper subset
B) improper subset
C) super set
D) none

41) The set of real Nos. (points) belonging to interval (a, b) is _____

A) finite set
B) empty set
C) singleton set
D) infinite set

42) The power set of an empty set is _____

A) null set
B) singleton set
C) super set
D) none
Answer: B
43) $X^{/} =$ _____

A) A
B) $A^{/}$
C) – -
D) X

44) Two set A & B are called overlapping if $A \cap B =$ _____

A) $A \subseteq B, B \subseteq A$
B) $A \subseteq B$
C) $A \subseteq B, B \subseteq A$
D) None

45) Which one is always true.
A) $A \subseteq B$
B) $A \cap B \subseteq B$
C) $B \subseteq A$
D) none

46) Every recurring non terminating decimal represents

A) Q
B) $Q^{/}$
C) R
D) none

47) If X & Y are two sets & n (X) = 18, n (Y) = 24, n(XUY) = 40 then n(X I Y) = _____

A) 3
B) 4
C) 6
D) 2
E) 1

48)   A real number is always

A) a natural no
B) positive integer
C) Rational number
D) complex number

Groups

1)   The set N of natural numbers is closed with respect to

A) Addition
B) Multiplication
C) Both A & B
D) Subtraction

Answer: C

2)   The set Z of integers is closed with respect to

A) Addition
B) Multiplication
C) Subtraction
D) A, B and C are correct

3)   The set R – {0} of real numbers is closed with respect to

A) Addition
B) Multiplication
C) Division
D)   A,B & C are correct

4)   In the set S = {0, 1} the binary operation defined is

A) –
B) +
C) ×
D) ÷

5)   The set S = {- 1, 1, - i, i} is a group with respect to the binary operation

A) ÷
B) ×
C) +
D) –

6)   The set S = {1, ω, ω^2} is a group with respect to the binary operation

A) ×
B) ÷
C) +
D) –

7)   If set is a group with respect to addition then the number of identity elements in S is

A) Unique
B) Two
C) Three
D) None

8)   If set S is a group with respect to addition then each element of S has _____ inverse.

A) Unique
B) Two
C) Three
D) None

9)   R – {0} is a group w.r.t the binary operation

A) +
B) ×
C) ÷
D) –

10)   Q – {0} is a group w.r.t the binary operation

A) +
B) ×
C) ÷
D) –

11)   R is a group w.r.t the binary operation.
A) +
B) ×
C) ÷
D) –

12)   Q is a group w.r.t the binary operation.
A) +
B) ×
C) ÷
D) –

13)   S = {1, - 1} is a group w.r.t the binary operation.
A) +
B) ×
C) -
D) none of these

14)   S = {0} is a trivial group under

A) +
B) ×
C) ÷
D) –

15)   S = {1} is trivial group under

A) +
B) ×
C) –
D) division

16)   A non empty set S which is closed with a binary operation '*' is called group if

A) The binary operation is associative
B) There exists identity element with respect to the binary operation.
C) There exist a unique inverse of each element of S with respect to the binary operation.
D) All A, B & C hold.

Answer: D

17) In a proposition if $p \rightarrow q$ then $q \rightarrow p$ is called

A) inverse of $p \rightarrow q$
B) converse of $p \rightarrow q$
C) contrapasitive $p \rightarrow q$
D) none

18) Truth table containing all false values is called
A) Tautology
B) Selfcontridiction
C) Equivallent
D) None

19) Truth table containing all true values is called
A) Tautology
B) Selfcontridiction
C) Equivallent
D) None

20) In a proposition if $p \rightarrow q$ then contrapasitive of this proposition is denoted by

A) $q \rightarrow p$
B) $\sim q \rightarrow p$
C) $\sim q \rightarrow \sim p$
D)   None

21) In a proposition if $p \rightarrow q$ then inverse of this proposition is denoted by

A) $q \rightarrow p$
B) $\sim q \rightarrow p$
C) $\sim p \rightarrow \sim q$
D)   None

22) In a proposition if $p \rightarrow q$ then converse of this proposition is denoted by

A) $q \rightarrow p$
B) $\sim q \rightarrow p$
C) $\sim q \rightarrow \sim p$
D)   None

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