QN	T.Y.B.Sc.(Mathematics) Subject: MTH-504: Lattice Theory Question Bank	ANS
1)	A relation R reflexive if A) aRa B) aRb C) aRc for all ,, a b c ϵ P	**A**
2)	A Relation R is called as anti-symmetric if aRb and bRa then……. A) a = b B) a≠ b C) Both A and B D) None of these	**A**
3)	Partial ordered relation on non-empty set P is (A) Reflexive (B) Anti-Symmetric (C) Transitive (D) All above	**D**
4)	Let X be a non-empty set and $(P(X),\subseteq)$ be a poset of all subsets of X. If $A,B\in P(X)$ then inf (A,B) is (A) A (B) B (C) $A\cup B$ (D) $A\cap B$	**D**
5)	The poset P={1,2,3,4,5,6,12} of factors of 12 under divisibility then the greatest element of P is (A) 1 (B) 2 (C) 12 (D) 6 C	**C**
6)	The poset P={1,2,3,4,5,6,12} of factors of 12 under divisibility then the greatest element of P is (A) 1 (B) 2 (C) 12 (D) 6	**A**
7)	The poset P={2,3,4,5,6} of non-trivial factors of 12 under divisibility then the greatest element of P is (A) 1 (B) 2 (C) 12 (D) 6	**D**

8)	The poset P={2,3,4,5,6} of non-trivial factors of 12 under divisibility then the greatest element of P is (A) 1 (B) 2 (C) 12 (D) 6	**A**
9)	The Cartesian product of two sets A and B is denoted as $A\times B$ and is defined as (A) $A\times B$ = {(a,b): $a\in A, b\in B$} (B) $A\times B$ = {(a,a): $a\in A, b\in B$} (C) $A\times B$ = {(b,b): $a\in A, b\in B$} (D) $A\times B$ = {(b,a): $a\in A, b\in B$}	**A**
10)	The Cartesian product of two sets A= {a,b} and B= {1,2} is denoted as $A\times B$ and is defined as (A) $A\times B$ = {$(a,1),(a,2),(b,1),(b,2)$} (B) $A\times B$ = {$(1,a),(2,b),(1,a),(b,2)$} (C) $A\times B$ = {$(a,1),(a,2)$} (D) $A\times B$ = {$(b,1),(b,2)$}	**A**
11)	The Cartesian product of two sets A= {a,b} and B= {x} is denoted as $A\times B$ and is defined as (A) $A\times B$ = {$(a,x),(a,2),(b,1),(b,2)$} (B) $A\times B$ = {$(1,a),(2,b),(1,a),(b,2)$} (C) $A\times B$ = {$(a,x),(b,x)$} (D) $A\times B$ = {$(b,1),(b,2)$}	**C**
12)	The set N of natural numbers under the usual ≤ satisfies which of the following properties (A) Reflexivity (B) Anti-Symmetry (C) Transitivity (D) All above	**D**
13)	If $a\leq b \leq\leq$ in a poset then a and b are called as …… A) Non comparable B) Comparable C) Rational D) None of these	**B**
14)	A lattice L is called a ____lattice if every non-empty subset of L has its Sup and Inf in L . (A) complete (B) semilattice (C) sublattice (D)none of these	**A**
15)	If $a\leq b$ and if a≠ b in a Poset then …… A) $a<b$ B) a> b C) a= b d) None of these	**A**
16)	The set of natural number under divisibility forms ……. A) Non Poset B) Poset C) Both A and B D) None of these	**B**
17)	If P is a Poset in which every element are comparable then P is called as …… A)Totally ordered set B) Non totally ordered set C) Infinite set D) None of these	**A**

18)	True or False : In a Poset P $a < a$ holds for all a $a \in a$ A) True B) False	**B**
19)	Greatest element, if exists in a Poset , will be ….. A) Unique B) Not unique C) Does not exists D) None of these	**A**
20)	Least element, if exists in a Poset, will be ….. A) Unique B) Not unique C) Does not exists D) None of these	**A**
21)	True or False: An element a in a Poset P is called as maximal element if $a < x$ for no $x \in p$ A) True B) False	**A**
22)	If S is a non-empty finite subset of a poset P Then S has ……. A) Maximal element B) Minimal element C) Both A and B D) None of these	**C**
23)	A mapping :$f: p \to Q$ is an …….. iff f is isotone and 1 f^{-1} is isotone A) Isomorphisms B) Not Isomorphism C) Both A and Bd) None of these	**A**
24)	If ρ is a relation on a set X and converse of ρ is denoted by $\bar{\rho}$, then $a\bar{\rho}\, b$ if and only if…….. A) $b\rho a$ B) $\bar{b}\rho a$ C) $b\rho\bar{a}$ D) None of the these	**A**
25)	If a Poset X is isomorphic to its dual X ,then X is called as…… A) Dual B) Self Dual C) Dual of dual D) None of these	**B**
26)	An element a in a Poset P is called as lower bound of S if……. A) $a \geq x$ B) $a \leq x$ C) $a \neq x$ D) None of these	**B**
27)	True or False : The Poset $\{2,3,4,6\}$ under divisibility is not lattice A) True B) False	**A**
28)	Let X be a non-empty set. Then $P(X)$ the power set of X under ⊆ satisfies which of the following properties (A) Reflexivity (B) Anti-Symmetry (C) Transitivity (D) All above	**D**
29)	Let N be the set of natural number under divisibility, then a……. A) gcd (a,b), B) $lcm(a,b)$, lcm a b C) Both A and B D)none of these	**A**
30)	Let L be the set of all subgroup of group G , and if L forms a Lattice under □ and if , H K ∈ l then HK □ …… A) $H \cup K$ B) $H \cap K$ c) $\{H \cup K\}$ D) None of these	**B**

31)	Any two elements of a every poset (A) must be comparable (B) must be non-comparable (C) may or may not be comparable (D) None of these	**C**
32)	In the poset of natural numbers N under divisibility, the numbers 2 and 3 are (A) comparable elements (B) not comparable elements (C) may or may not be comparable (D) None of these	**B**
33)	If P is a poset in which every two members are comparable, then it is called as _____ (A) totally ordered set (B) toset (C) chain (D) All above	**D**
34)	A poset $(L, \leq)$ is a lattice iff every non empty finite subset of L has… A) Sup B) Inf C) Sup and Inf D) None of these	**C**
35)	Let L be a lattice and if ,, $a, b, c \in l$, then $a \wedge (a \vee \vee b)$…….. a) b B) a C) c D) None of these	**B**
36)	Let L be a lattice and $0, u \in l$ then $0 \wedge a$ …….. A) a B) 0 C) 1 D) None of these	**B**
37)	True or False : In a lattice L the modular inequality $a \wedge (b \vee c) \geq b \wedge (a \vee c)$ A) True B) False	**A**
38)	If the greatest element exists, then it is comparable with ____ elements of the poset. (A) two (B) all (C) three (D) some	**B**

39)	Let P be a poset. If there exists an element $a \in P$ such that $x \leq a$ for all $x \in P$ then a is called _____ of P. (A) least element (B) greatest element (C) zero element (D) minimal element	**B**
40)	Let P be a poset. If there exists an element $b \in P$ such that $b \leq x$ for all $x \in P$ then b is called _____ of P. (A) least element (B) greatest element (C) unity element (D) maximal element	**A**
41)	In a lattice L ,If $a \geq b$, then $a \wedge b$ …….. A) b B) a C) ab □ D) None of these	**A**
42)	True or False : Dual of a lattice is a lattice A) True B) False	**A**
43)	True or False : Product of two lattices is again a lattice A) False B) True	**B**
44)	True or False: A finite lattice has both least and greatest elements. A) True B) False	**A**
45)	A finite lattice has ---------- (A) least elements (B) greatest elements (C) both least and greatest elements (D) none of these	**C**
46)	A poset $(P, \leq)$ is called a _____ if for all ,$b \in P$, $Sup\ \{a,b\}$ exists. (A) meet semilattice (B) semilattice (C) join semilattice (D)none of these	**C**
47)	A poset $(P, \leq)$ is called a _____ if for all ,$b \in P$, $Inf\ \{a,b\}$ exists. (A) meet semilattice (B) semilattice (C) join semilattice (D)none of these	**A**
48)	A poset $(P, \leq)$ is called a _____ if for all ,$b \in P$, $Inf\ \{a,b\}$ and $Sup\ \{a,b\}$ exists. (A) meet semilattice (B) semilattice (C) join semilattice D)none of these	**B**
49)	A chain has ---------- (A) least elements (B) greatest elements (C) both least and greatest elements (D) none of these	**C**