Course/Branch : ***C301*** /CSE	**Year / Semester** :II/III	Format No.	NAC/TLP-07a.13
Subject Code : ***MA8351***	**Subject Name** : Discrete Mathematics	Rev. No.	02
Unit No :5	**Unit Name : Lattices and Boolean Algebra**	Date	30.09.2020

OBJECTIVE TYPE QUESTION BANK

S. No.	Objective Questions (MCQ /True or False / Fill up with Choices)	BTL
1	Algebra of logic is termed as _____ a) Numerical logic b) Boolean algebra **c) Arithmetic logic** d) Boolean number	L1
2	Boolean algebra can be used _____ **a) For designing of the digital computers** b) In building logic symbols c) Circuit theory d) Building algebraic functions	L1
3	What is the definition of Boolean functions? a) An arithmetic function with k degrees such that $f:Y \rightarrow Y^k$ **b) A special mathematical function with n degrees such that $f:Y^n \rightarrow Y$** c) An algebraic function with n degrees such that $f:X^n \rightarrow X$ d) A polynomial function with k degrees such that $f:X^2 \rightarrow X^n$	L1
4	F(X,Y,Z,M) = X`Y`Z`M`. The degree of the function is _____ a) 2 b) 5 **c) 4** d) 1	L2
5	A _____ value is represented by a Boolean expression. a) Positive b) Recursive c) Negative **d) Boolean**	L1
6	The _____ of all the variables in direct or complemented from is a maxterm. **a) addition** b) product c) modular d) subtraction	L1

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7	Let a set S = {2, 4, 8, 16, 32} and <= be the partial order defined by S <= R if a divides b. Number of edges in the Hasse diagram of is _____ a) 6 b) 5 c) 9 **d) 4**	L2
8	The less-than relation, <, on a set of real numbers is _____ **a) not a partial ordering because it is not asymmetric and irreflexive equals antisymmetric** b) a partial ordering since it is asymmetric and reflexive c) a partial ordering since it is antisymmetric and reflexive d) not a partial ordering because it is not antisymmetric and reflexive	L2
9	If the longest chain in a partial order is of length l, then the partial order can be written as _____ disjoint antichains. a) l^2 b) l+1 **c) l** d) l^l	L2
10	Consider the ordering relation a | b ⊆ N x N over natural numbers N such that a | b if there exists c belong to N such that a*c=b. Then _____ a) | is an equivalence relation b) It is a total order c) Every subset of N has an upper bound under | **d) (N,|) is a lattice but not a complete lattice**	L1
11	A Poset in which every pair of elements has both a least upper bound and a greatest lower bound is termed as _____ a) sublattice **b) lattice** c) trail d) walk	L1
12	In the poset (Z^+, |) (where Z^+ is the set of all positive integers and | is the divides relation) are the integers 9 and 351 comparable? **a) comparable** b) not comparable c) comparable but not determined d) determined but not comparable	L2

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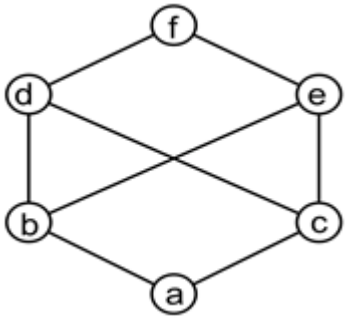
13	If every two elements of a poset are comparable then the poset is called _____ a) sub ordered poset **b) totally ordered poset** c) sub lattice d) semigroup	L2
14	The less than relation, <, on reals is--- a) a partial ordering since it is asymmetric and reflexive. b) partial ordering since it is anti-symmetric and reflexive. c) not a partial ordering because it is not asymmetric and not reflexive d) **not a partial ordering because it is not anti- symmetric and not reflexive**	L2
15	A _____ has a greatest element and a least element which satisfy 0<=a<=1 for every a in the lattice(say, L). a) semilattice b) join semilattice c) meet semilattice **d) bounded lattice**	L2
16	The graph given below is an example of _____  **a) non-lattice poset** b) semilattice c) partial lattice d) bounded lattice	L3
17	A sublattice(say, S) of a lattice(say, L) is a convex sublattice of L if _____ a) x>=z, where x in S implies z in S, for every element x, y in L b) x=y and y<=z, where x, y in S implies z in S, for every element x, y, z in L **c) x<=y<=z, where x, y in S implies z in S, for every element x, y, z in L** d) x=y and y>=z, where x, y in S implies z in S, for every element x, y, z in L	L2
18	The graph is the smallest non-modular lattice N_5. A lattice is _____ if and only if it does not have a _____ isomorphic to N_5.	L3

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	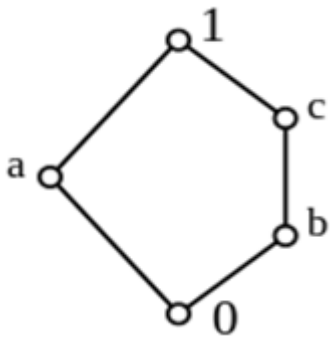 a) non-modular, complete lattice b) moduler, semilattice c) non-modular, sublattice **d) modular, sublattice**	
19	Every poset that is a complete semilattice must always be a _____ a) sublattice **b) complete lattice** c) free lattice d) partial lattice	L1
20	A free semilattice has the _____ property. a) intersection b) commutative and associative c) identity **d) universal**	L1
21	Let D_{30} = {1, 2, 3, 4, 5, 6, 10, 15, 30} and relation I be partial ordering on D_{30}. The all lower bounds of 10 and 15 respectively are a) 1,3 **b)1,5** c) 1,3,5 d) None	L2
22	Hasse diagrams are drawn for a)Partially ordered sets b)Lattices c)Boolean Algebra **d)None**	L2
23	A self-complemented, distributive lattice is called-------- **a) Boolean algebra** b) Modular lattice c) Complete lattice d) Self dual lattice	L2
24	Let D_{30} = {1, 2, 3, 5, 6, 10, 15, 30} and relation I be a partial ordering on D_{30}. The lub of 10 and 15 respectively is **a)30** b)15 c)10	L3

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	d)6	
25	Let X = {2, 3, 6, 12, 24}, and ≤ be the partial order defined by X ≤ Y if X divides Y. Number of edges in the Hasse diagram of (X, ≤) is a)3 **b)4** c)5 d)0	L3
26	Principle of duality is defined as----- a) ≤ is replaced by ≥ b) LUB becomes GLB c) all properties are unaltered when ≤ is replaced by ≥ **d) all properties are unaltered when ≤ is replaced by ≥ other than 0 and 1 element.**	L1
27	Different partially ordered sets may be represented by the same Hasse diagram if they are a) same b) lattices with same order c) isomorphic **d) order-isomorphic**	L1
28	The absorption law is defined as a) a * (a * b) = b b) a * (a ⊕ b) = b c) a * (a * b) = a ⊕ b **d) a * (a □ b) = a**	L1
29	A partial order is defined on the set S = {x, a_1, a_2, a_3,..... a_n, y} as x ≤ a i for all i and a_i ≤ y for all i, where n ≥ 1.Number of total orders on the set S which contain partial order ≤ is a)1 b)n c)n+2 **d)n!**	L2
30	If lattice (C ,≤) is a complemented chain, then a) |C|≤1 **b) |C|≤2** c) |C| >1 d) C doesn't exist	L1
31	A self-complemented, distributive lattice is called----- **a) Boolean algebra** b) Modular lattice c) Complete lattice d) Self dual lattice	L1

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