Vidyavardhini's College of Engineering & Technology, Vasai

Department of Computer Engineering

Academic Year 2020-21

Sub: Discrete Structures **(**CSC305**)**

Year/Sem:- SE/ Sem III

Max. Marks: 50

Q.No.	Questions	Marks
1	The union of the sets {1, 2, 5} and {1, 2, 6} is the set _____ a) {1, 2, 6, 1} b) {1, 2, 5, 6} c) {1, 2, 1, 2} d) {1, 5, 6, 3}	2
2	The intersection of the sets {1, 2, 5} and {1, 2, 6} is the set _____ a) {1, 2} b) {5, 6} c) {2, 5} d) {1, 6}	2
3	The difference of {1, 2, 3} and {1, 2, 5} is the set _____ a) {1} b) {5} c) {3} d) {2}	2
4	The compound propositions p and q are called logically equivalent if _____ is a tautology. a) p $\boxed{\leftrightarrow}$ q b) p → q c) ¬ (p ∨ q) d) ¬p ∨ ¬q	2
5	p → q is logically equivalent to _____ a) ¬p ∨ ¬q b) p ∨ ¬q c) ¬p ∨ q d) ¬p ∧ q	2
6	p ∨ q is logically equivalent to _____ a) ¬q → ¬p	2

	b) $q \rightarrow p$ c) $\neg p \rightarrow \neg q$ d) $\neg p \rightarrow q$	
7	The binary relation {(1,1), (2,1), (2,2), (2,3), (2,4), (3,1), (3,2)} on the set {1, 2, 3} is _____ a) reflective, symmetric and transitive b) irreflexive, symmetric and transitive c) neither reflective, nor irreflexive but transitive d) irreflexive and antisymmetric	2
8	Consider the relation: R' (x, y) if and only if x, y>0 over the set of non-zero rational numbers,then R' is _____ a) not equivalence relation b) an equivalence relation c) transitive and asymmetry relation d) reflexive and antisymmetric relation	2
9	A directed graph or digraph can have directed cycle in which _____ a) starting node and ending node are different b) starting node and ending node are same c) minimum four vertices can be there d) ending node does not exist	2
10	What is a complete digraph? a) connection of nodes without containing any cycle b) connecting nodes to make at least three complete cycles c) start node and end node in a graph are same having a cycle d) connection of every node with every other node including itself in a digraph	2
11	A function is said to be _____ if and only if f(a) = f(b) implies that a = b for all a and b in the domain of f. a) One-to-many b) One-to-one c) Many-to-many d) Many-to-one	2
12	A drawer contains 12 red and 12 blue socks, all unmatched. A person takes socks out at random in the dark. How many socks must he take out to be sure that he has at least two blue socks? a) 18 b) 35 c) 28 d) 14	2
13	The least number of computers required to connect 10 computers to 5 routers to guarantee 5 computers can directly access 5 routers is _____ a) 74 b) 104	2

	c) 30 d) 67	
14	Consider the recurrence relation $a_1=4$, $a_n=5n+a_{n-1}$. The value of a_{64} is _____ a) 10399 b) 23760 c) 75100 d) 53700	2
15	What is the recurrence relation for 1, 7, 31, 127, 499? a) $b_{n+1}=5b_{n-1}+3$ b) $b_n=4b_n+7!$ c) $b_n=4b_{n-1}+3$ d) $b_n=b_{n-1}+1$	2
16	Find the value of a_4 for the recurrence relation $a_n=2a_{n-1}+3$, with $a_0=6$. a) 320 b) 221 c) 141 d) 65	2
17	In a 7-node directed cyclic graph, the number of Hamiltonian cycle is to be _____ a) 728 b) 450 c) 360 d) 260	2
18	If each and every vertex in G has degree at most 23 then G can have a vertex colouring of _____ a) 24 b) 23 c) 176 d) 54	2
19	In a _____ the vertex set and the edge set are finite sets. a) finite graph b) bipartite graph c) infinite graph d) connected graph	2
20	An n-vertex graph has _____ edges. a) n^2 b) n-1 c) n*n d) n*(n+1)/2	2
21	The tree elements are called _____ a) vertices b) nodes	2

	c) points d) edges	
22	Two labelled trees are isomorphic if _____ a) graphs of the two trees are isomorphic b) the two trees have same label c) graphs of the two trees are isomorphic and the two trees have the same label d) graphs of the two trees are cyclic	2
23	A non empty set A is termed as an algebraic structure _____ a) with respect to binary operation * b) with respect to ternary operation ? c) with respect to binary operation + d) with respect to unary operation –	2
24	An algebraic structure _____ is called a semigroup. a) (P, *) b) (Q, +, *) c) (P, +) d) (+, *)	2
25	Condition for monoid is _____ a) (a+e)=a b) (a*e)=(a+e) c) a=(a*(a+e) d) (a*e)=(e*a)=a	2