CSE

PRN:		Course Code :	CST2302

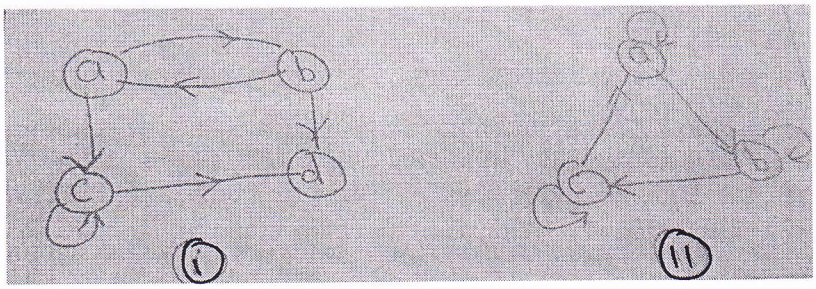
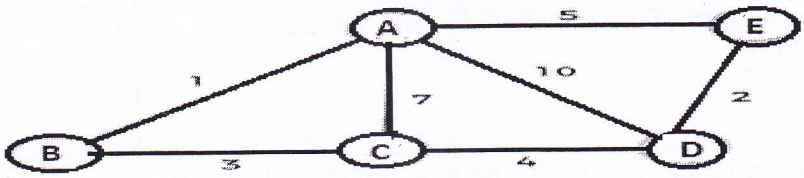
Second Year **B. Tech** End Semester Examination Winter 2023

Discrete Structures

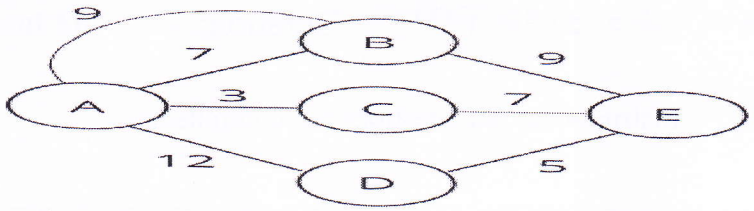
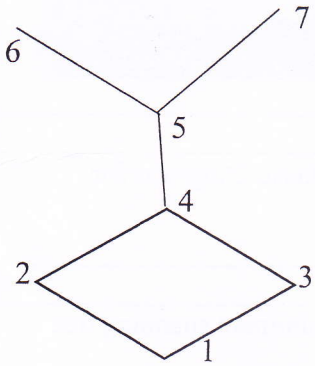
Day and Date: Thursday, 30/11/2023 Max Marks: **100**

Time : 10.30 am to 1.30 PM Duration: **03** hrs

Instructions: All questions are compulsory.

Q.1		**Attempt the following**	**Marks**	**Bloom's Level**	**CO**
	a)	What is Set? Given Universal Set U that consist of all Natural numbers from 1 to 20. Set A & B are subset of U which are A= {2,5,9,15,19} and B= {8,9,10,13,15,17} Find A U B, ,A+B,	08	L1	CO1
	b)	From the following graph write the relation as a set of orders pair & prove that wither the given relation is equivalence relation.  	08	L5	CO1
		OR			
	b)	What is Hasse Diagram? Construct the Hasse Diagram for {(1,2,3), <= }.	08	L2	CO1
Q.2		**Attempt the following**			
	a)	Explain krushal's algorithm. Construct the minimum spanning tree with kruskals algorithm for the following  	08	L5	CO2

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	b)	What is Binary Search Tree? Build the binary search tree after inserting 3,1,4,6,9,2,5,7 into an initially empty binary search tree. After constructing Delete 3 from BST	08	L3	CO2
		OR			
	b)	Explain Prim's algorithm. Construct the minimum spanning tree with prims algorithm for the following 	08	L6	CO2
Q.3		**Attempt any two from the following**			
	a)	What is Tautology? Make the truth table for the following & identity whether it is tautology or not? $(P \wedge (P \rightarrow Q)) \rightarrow Q$	08	L1	CO1
	b)	Explain Normal Form & its type. Obtain a CNF for $P \rightarrow [(P \rightarrow Q) \wedge \sim(\sim Q \vee \sim P)]$	08	L2	CO1
	c)	What is polish notations? Construct Infix to Prefix Notation for the following (A+B) *C+D/(E+F*G)-H	08	L3	CO1
Q.4		**Attempt any two from the following**			
	a)	Define Lattices. Check whether the following Hasse Diagram is lattice or not. 	08	L1	CO4
	b)	Explain Boolean algebra. Simplify the following equation 1.A[B+C(AB+AC)] 2.AB+ABC+B+AC	08	L4	CO4
	c)	Prove the following Equation with the help of Boolean algebra 1.(a+b)(+c)+b(+)=a+ac+b	08	L5	CO4

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		2.a.b+c(+)=a.b+c			
Q.5		**Attempt any Two of the following**			
	a)	Let G= {0,1,2,3,4,5} here < G, $+_5$> construct the following • Composition table with respect to + modulo 5 • Prove that G is a group • Find inverse of each element	09	L3	CO5
	b)	Prove that set S={0,1,2,3,4} is a ring with respect to operation of addition & multiplication modulo 5	09	L5	CO5
	c)	Explain General properties of Algebraic structure with example.	09	L2	CO5
Q.6		**Attempt any Two of the following**			
	a)	A bag1 contain 4 White & 6 black balls, while another bag 2 contain 4 white & 3 black ball.1 ball is drawn at random from one of the bag and it is found to be black. Find the probability that it was drawn from bag1 by using Bayes theorem.	09	L3	CO
	b)	What is well ordering principle and generating function? Find out the sequence generated by the generating function $(3+x)^3$	09	L1	CO3
	c)	What is permutation & combination? Suppose there are 8 men's & 10 women's, you need to form a committee of 5 men's & 6 women's, In how many ways can the committee be formed ?	09	L1	CO3

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