Printed page:3Subject Code:ACSE 0306

Roll No: | | | | | | | | | | | 0 | 5 | 5 |

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute)

Affiliated to Dr. A.P. J. Abdul Kalam Technical University, Uttar Pradesh, Lucknow

Course: B.Tech. Branch: CSE

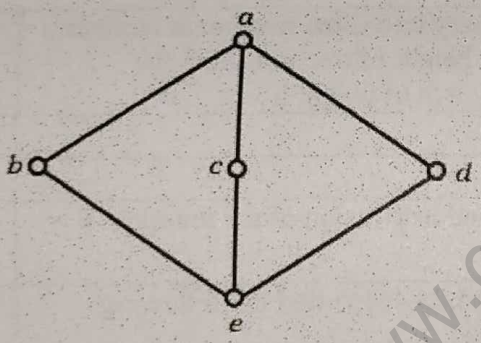
Semester 3 Sessional Examination III Year- (2021- 2022)

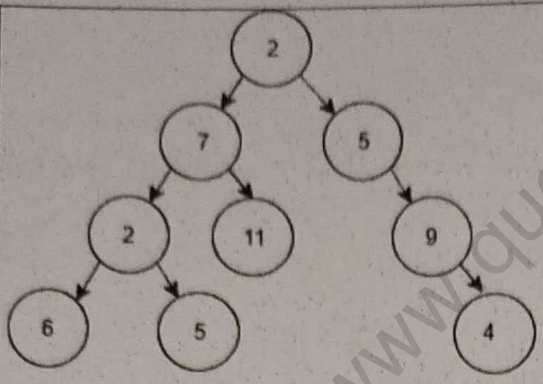
Subject Name: DISCRETE STRUCTURES

Time: 1.15Hours [SET-B] Max. Marks:30

General Instructions:

- This Question paper consists of 3 pages & 5 questions.It comprises of three Sections, A, B, and C
- Section A -Question No- 1 is objective type questions carrying 1 mark each, Question No- 2 is very short answer type carrying 2 mark each. You are expected to answer them as directed.
- Section B - Question No-3 is Short answer type questions carrying 5 marks each. Attempt any two out of three questions given.
- Section C -Question No. 4 &5are Long answer type (within unit choice) questions carrying 6marks each. Attempt any one part *a* or*b*.

		SECTION – A	[08Marks]	
1.		**All questions are compulsory**	(4×1=4)	
	a.	The following is the Hasse diagram of the poset [{a, b, c, d, e}, ≤]  The poset is a) not alattice b) a lattice but not a distributivelattice c) a distributive lattice but not a Booleanalgebra d) Booleanalgebra	(1)	CO3
	b.	For the tree below, write the level-order traversal	(1)	C05



a) 2, 7, 2, 6, 5, 11, 5, 9,4

b) 2, 7, 5, 2, 11, 9, 6, 5,4

c) 2, 5, 11, 6, 7, 4, 9, 5,2

d) 2, 7, 5, 6, 11, 2, 5, 4,9

	c.	DeMorgan's theorem statesthat_____ a) (AB)' = A' + B' b) (A + B)' = A' * B c) A' + B' =A'B' d)(AB)' = A' +B	(1)	CO3
	d.	An n-vertextreehas_____edges. a) n2 b) n-1 c) n*n d) n*(n+1)/2	(1)	CO5
2.		**All questions are compulsory**	**(2×2=4)**	
	a.	Define Boolean Algebra. Prove that the Boolean identity : a.b+a.b'=a.	(2)	CO3
	b.	Define Binary tree. The height of a binary tree is the maximum number of edges in any root to leaf path. If the height of tree is 4. Find the maximum number of nodes in a binary tree of height h .	(2)	CO5
		SECTION – B		
3.		**Answer any <u>two</u>of the following-**	**[10Marks]** **(2×5=10)**	
	a.	Use Karnaugh map to find the simplified expression of the function: F = x'yz + xy + xy'z'.	(5)	CO3
	b.	For the given partial order set ({3,5,9,15,24,45},/) find the following: 1. maximal element 2. minimal element 3. Greatest element GLB 4. Least element LUB 5. Upper bound and lower bound for {3,5) 6. Upper bound and lower bound for {15,45}	(5)	CO3
	c.	Consider the following P: you take a course in discrete math. Q: you understand logic R: you get an A on final exam Write in simple sentences the meaning of the following: 1. $Q \rightarrow R$ 2. $(P \wedge Q) \rightarrow R$ 3. $(P \wedge \neg Q) R$	(5)	CO4

SECTION – C

			[12Marks]	
	Answer any one of the following-		**(1×6=6)**	
	a.	Define Partial order relation. Show whether the relation $(x, y) \in R$, if, $x \geq y$ definedon the set of +ve integers is a partial order relation.	**(6)**	CO3
	b.	Define Binary Search Tree .The preorder traversal sequence of a binary search tree is- 30 , 20 , 10 , 15 , 25 , 23 , 39 , 35 , 42 . What is the post order traversal sequence of the same tree?	**(6)**	CO5
5.	Answer any one of the following-		**(1×6=6)**	
	a.	Draw the unique binary tree when the inorder and preorder traversal is given asfollows:	**(6)**	CO5

Inorder	B	A	D	C	F	E	J	H	K	G	I
Preorder	A	B	C	D	E	F	G	H	J	K	I

	b.	Define Poset. Draw the Hasse diagram for the relation divisibility of (S, /) where S={1,2,3,4,6,8,12}.								**(6)**	CO3