

K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

Nov – Dec 2023

(B.Tech) Program: Computer Engineering

Examination: SY Semester: III. (Scheme II B)

Course Code: CEC303 and Course Name: DATA STRUCTURE

Date : 01/12/23

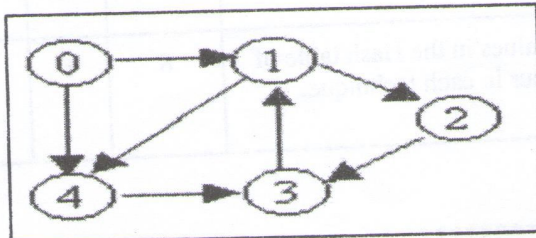
Duration: 2.5 Hours

Max. Marks: 60

Instructions:

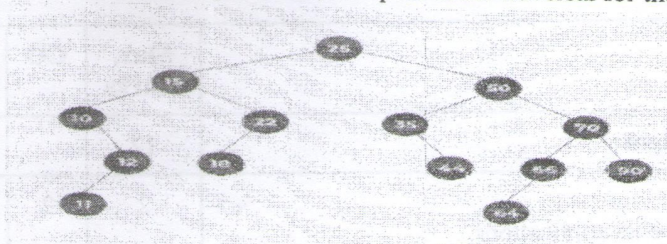
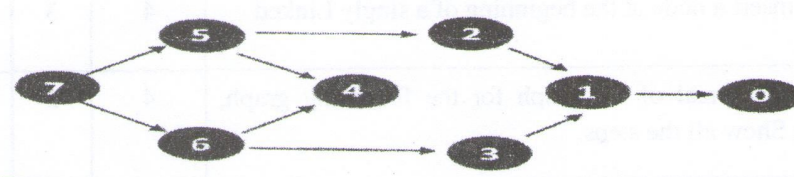
- (1) All questions are compulsory.
- (2) Draw neat diagrams wherever applicable.
- (3) Assume suitable data, if necessary.

		Max. Marks	CO	BT level
Q 1	Solve any six questions out of eight:	12		
i)	Define Stack data structure ? Give its applications.	2	2	U
ii)	Differentiate between singly linked list and array.	2	3	U
iii)	Explain the concept of Abstract data type?	2	1	U
iv)	Differentiate between DFS and BFS.	2	5	U
v)	Draw expression tree for an equation $a - (b + c) * (d / e)$	2	4	A
vi)	Write an algorithm for enqueue operation	2	2	U
vii)	Draw a binary tree for given numbers 15,9,12,78,66,98,13,20	2	4	U
viii)	Write the algorithm for linear search	2	6	U
Q.2	Solve any four questions out of six.	16		
i)	Explain the priority queue in detail with its applications	4	2	U
ii)	Convert infix expression to postfix $A*(B+C)/D*(E-F)$	4	2	A
iii)	Write an algorithm to insert a node at the beginning of a singly Linked list.	4	3	U
iv)	Give the Breadth-first traversal of the graph for the following graph, starting from vertex 0. Show all the steps.	4	5	A



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v)	Find the in-order, pre-order, and post-order traversal for the following 	4	4	A
vi)	Given a hash table of 50 locations, calculate the hash value using division method for keys 5678, 321, and 34567	4	6	A
Q.3	Solve any two questions out of three.	16		
i)	Evaluate postfix expression 8,3,2,4,+,*,*,5/,2,-	8	2	A
ii)	Write an algorithm for inserting elements in doubly Linked list at the beginning and in the middle.	8	3	U
iii)	Write the algorithms for push, pop, traverse and search operations	8	2	U
Q.4	Solve any two questions out of three.	16		
i)	Insert the following elements in an AVL tree. 23, 54, 59, 13, 20, 12, 35, 42.	8	4	A
ii)	Find at least two topological sorts for the following 	8	5	A
iii)	Apply linear probing hash functions to insert values in the Hash table of size 11. Show the number of collisions that occur in each technique. 25, 73, 55, 45, 35, 28, 29,101	8	6	A
