

Code - 2006

G. S. Mandal's

Maharashtra Institute of Technology, Aurangabad

(An Autonomous Institute)

END SEMESTER EXAMINATION

Second Year B.Tech (CSE) – Feb/Mar-2023

Course Code :CSE201

Course Name : Data Structures

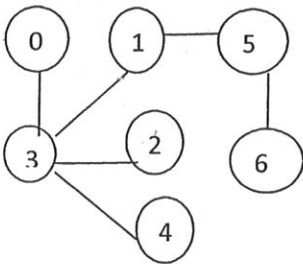
Duration : 2 Hrs Max. Marks : 50

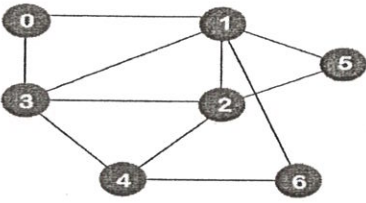
Date :

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Instructions :

- All questions are compulsory.
- Assume suitable data wherever necessary and clearly state it.
- Figures to right indicate full marks.

Q. 1	Answer any five(Marks:10)	Marks	CO	BL	PI
a)	Which of the following is an application of stack? i) finding factorial ii). interrupt handling in operating system iii). Tower of Hanoi iv). evaluation of postfix expression	2	1	2	2.2.2
b)	Differentiate between linear and linear data structure.	2	1	2	2.2.2
c)	Write the 'c' function for implementing the overflow condition in a queue.	2	2	2	1.3.1
d)	What is the postfix form of the following infix expression $(A+B)*(C*D-E)*F/G$	2	2	3	2.2.3
e)	Write an algorithm for deleting a node which is at the end of a circular linked list.	2	3	2	2.2.2
f)	Show the result of inserting 2, 1, 4, 5, 9, 3, 6, 7 into an AVL tree.	2	4	3	2.2.3
g)	Find the articulation point in the following graph. 	2	5	2	2.2.3
h)	What is the time complexity of binary search algorithm?	2	6	1	2.2.2
Q.2	Explain any four stack operations with a 'C' routine. OR Explain the operations on priority queue in detail.	8	2	2	2.2.2
Q.3	What are the advantages and disadvantages of linked list over arrays? Explain the insertion and deletion	8	3	2	2.2.4

	<p>operations in a circular linked list.</p> <p style="text-align: center;">OR</p> <p>Explain the application of the suitable data structure for implementing the algorithm for the polynomial manipulation.</p>				
Q.4	<p>Develop an algorithm for constructing a binary search tree. Include routines for insertion, deletion. Illustrate the same with an example.</p> <p style="text-align: center;">OR</p> <p>Explain the traversal operations of a BST with an algorithm and illustrate it with a suitable example.</p>	8	4	3	2.2.3
Q.5	<p>Explain with example the depth first traversal of a graph and compare it with breadth first traversal.</p> <p style="text-align: center;">OR</p> <p>For the following graph, write the adjacency matrix and linked list representation. Find the depth first traversal and breadth first traversal sequences using the appropriate data structures.</p> <div style="text-align: center;">  </div>	8	5	4	2.2.4
Q.6	<p>Write pseudo code for searching an element in a given array using binary search. What is the time complexity of linear search in best case, average case and worst case?</p> <p style="text-align: center;">OR</p> <p>Write a pseudo code for quick sort to sort a given array of 'n' numbers. Show the contents of an array after each iteration for the following array: 57 50 79 100 59 40 20 What is the worst case and average case time complexity of quick sort ?</p>	8	6	2	2.2.3