

Code -

G. S. Mandal's

**Maharashtra Institute of Technology, Aurangabad**

(An Autonomous Institute)

END SEMESTER EXAMINATION

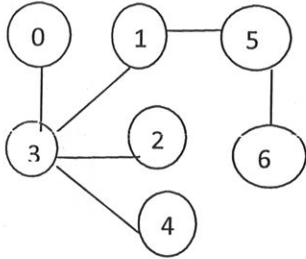
**Second Year B.Tech (CSE) – Feb/Mar-2023**

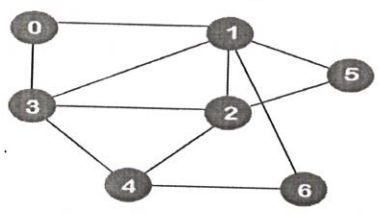
Course Code :CSE201

Course Name : Data Structures

Duration : 2 Hrs Max. Marks : 50

Date :

Q. 1	Answer any five(Marks:10)	Stepwise Marking Scheme
	Answer/Solution	
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	2M
b)	Any Four differences between a linear and non linear data structure.	2M
c)	C code for implementing the overflow condition in a queue.	2M
d)	postfix form of the following infix expression $(A + B) * (C * D - E) * F / G$ and final result	2M
e)	Writing algorithm for deleting a node which is at the end of a circular linked list.	2M
f)	Show the result of inserting 2, 1, 4, 5, 9, 3, 6, 7 into an AVL tree.	2M
g)	Find the articulation point in the following graph. 	2M
h)	What is the time complexity of binary search algorithm?	2M
Q.2	Explanation of any four stack operations push, pop, peek, isfull() isempty() with a 'C' routine. OR Explanation of the operations enqueue and dequeue of priority queue .	8M
Q.3	Advantages and disadvantages of linked list over arrays	4M

	<p>Insertion and deletion operations in a circular linked list.</p> <p style="text-align: center;">OR</p> <p>Explanation of application of single linked list for implementing polynomial addition or multiplication</p>	<p>4M</p> <p>8M</p>
Q.4	<p>Develop an algorithm for constructing a binary search tree. Include routines for insertion, deletion. . Illustration of BST 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>	<p>4M</p> <p>4M</p>
Q.5	<p>Explanation of depth first traversal of a graph . Comparison 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.</p> <p>Finding the depth first traversal and breadth first traversal sequences using the appropriate data structures stack and queue.</p> <div style="text-align: center;">  </div>	<p>4M</p> <p>4M</p> <p>4M</p> <p>4M</p>
Q.6	<p>Pseudo code for searching an element in a given array using binary search.</p> <p>Time complexity of linear search in best case, average case and worst case</p> <p style="text-align: center;">OR</p> <p>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</p> <p>The worst case and average case time complexity of quick sort</p>	<p>4M</p> <p>4M</p> <p>3M</p> <p>3M</p> <p>2M</p>

  
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