



B.E. DEGREE EXAMINATIONS: MAY 2015

(Regulation 2013)

Fourth Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

U13CST411: Data Structures

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. The technique which is used to divide the original problem into two or more sub-problems which can hopefully be solved more efficiently by the same technique is called
 - a) dynamic programming
 - b) Backtracking
 - c) divide and conquer
 - d) Greedy
2. A sequence of explicit and unambiguous instructions to solve a problem is called._____
3. The minimum number of fields with each node of doubly linked list
 - a) 4
 - b) 3
 - c) 2
 - d) 1
4. The data structure used to implement the recursive procedure is _____.
5. The total number of nodes in a complete binary tree of height 4 is _____.
 - a) 7
 - b) 15
 - c) 31
 - d) 63
6. The data structure is best suited for efficient implementation of priority queues is_____.
7. The way a card game player arranges his cards as he picks them up one by one, is an example of
 - a) Insertion sort
 - b) Shell sort
 - c) Quick sort
 - d) Heap sort
8. The worst case time complexity of heap sort is _____
9. Algorithm which solves the single source shortest-path problem is
 - a) Warshall's algorithm
 - b) Floyd's Algorithm
 - c) Prim's Algorithm
 - d) Dijkstra's algorithm
10. A graph with no articulation point is called _____.

PART B (10 x 2 = 20 Marks)

(Not more than 40 words)

11. Give the steps to exchange the value of a and b without using a temporary variable.
12. Define Big oh notation.
13. Define Abstract Data Type
14. Convert the infix expression $(A-B/C)*(D/E-F)$ into postfix.
15. What are the various representations of a binary tree?
16. What is hashing?
17. State the importance of sorting
18. List the examples for external sorting.
19. What is topological sort?
20. Mention the various decision problems which are NP-Complete.

PART C (5 x 14 = 70 Marks)

(Not more than 400 words)

Q.No. 21 is Compulsory

21. Describe the top-down design methodology of problem solving.

22. a) How the creation, insertion and deletion operations performed on a singly linked list? Explain with suitable algorithms.

(OR)

 - b) (i) Explain the insert operation in a circular queue. (6)
 - (ii) Discuss the algorithms for push and pop operations on stack. (8)

23. a) (i) Write a recursive algorithm to find a node in a Binary Search Tree. (5)
(ii) Write an algorithm for preorder, inorder and postorder tree traversals. (9)

(OR)

 - b) (i) Name the different hashing functions and explain with an example. (7)
 - (ii) How is the delete operation performed on binary heap? Explain. (7)

24. a) Discuss the merge sort algorithm with suitable example.

(OR)

 - b) Explain the quick sort algorithm. Using this algorithm sort the following numbers. 50,40,20,60,80,100,45,70,105,30,90,75

25. a) (i) Explain the various representations of graphs. (7)
(ii) Discuss the depth first search algorithm. (7)

(OR)

- b) Find out the minimum spanning tree of a given graph by prim's algorithm.


