KUMARAGURU
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Register Number: ……..

B.TECH DEGREE EXAMINATIONS: JUNE 2015

(Regulation 2009)

Third Semester

CSE201: DATA STRUCTURES AND ALGORITHMS

(Common to ECE/EEE/EIE)

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. The best data structure to check whether an arithmetic expression has balanced parentheses is
   a) Queue b) Stack c) Tree d)List
2. Example of Linear data structures
   a) Stack b)Graph c)B-Tree d) AVL Tree
3. What is the postfix form of the following prefix *+AB-CD
   a) AB+CD-* b) ABC+*- c)AB+*CD- d) AB+*CD-
4. The full form of dequeue is ……..
   a) Queue b)Double ended queue c)List d)Balanced queue
5. The maximum nodes on level `i` of a binary tree is
   a) 2^{i+1} b)3^{i+1} c) i+1 d)2^{i+2}
6. The number of …….of a node is called its degree.
   a)Paths b)Edges c) Sub tree d)Adjacent nodes
7. Which of the following sort method is stable
   a)Straight Insertion sort b) Binary sort c)Shell sort d)Heap Sort
8. The order of selection sort comes out to be of ……..
   a)O(n) b) $O(n^2)$ c)O(n-1) d) $O(n^{2-1})$
9. The time required to find shortest path in the graph with ‘n’ vertices and ‘e’ edges is……
   a)O(e) b)O(n) c)$O(e^2)$ d)$O(n^2)$
10. …….method is used to build minimum cost of spanning tree

a) Krushkal Method b)Multi list c) Euler graph d) Planner Graph

PART B (10 x 2 = 20 Marks)

11. Why the data structure and various supporting algorithms are necessary for operating systems?
12. How priority queue is different from simple queue?
13. Is Queue and Stack are useful in process management of operating systems? Justify.
14. List any two real-time example of stack implementation and brief how stack concepts are used.
15. What is the difference between tree, binary tree and binary search tree?
16. How do you convert a general tree into binary tree?
17. State the status of an away after first pass of quick sort with an example.
18. Construct min heap for the data: 5, 10, 2, 7, 8, 9, 15.
19. Define connected graph and complete graph.
20. What is topological sorting?

PART C (5 x 14 = 70 Marks)

21. a) What is Top- Down Design of algorithms? Explain in detail.

(OR)

b) How do you assess the efficiency of algorithms, what notations are used? Explain with an example.

22. a) How do you implement link list? Write a algorithm or pseudo code for the following:
i) Perform an insertion after the 'k' th node in the list **(7)**
ii) Delete the previous element of the given element **(7)**

(**OR)**

b) What are the basic operations of Stack ADT? Explain with relevant examples.

23. a) Write the routine for insertion and deletion operation in binary search tree?

(OR)

b) How do you differentiate various tree traversing methods, explain with necessary examples.

24. a) Explain quick sort with example.

(OR)

b) How do you choose a particular sorting algorithm for sorting of ‘n’ elements? What are the various considerations are necessary before to choose the sorting algorithms? Explain.

25. a) What is the use of Kruskal’s algorithm? Explain with necessary examples.

(OR)

b) Is undirected graphs are useful? Where do you use? Explain with examples.

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