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Total No. of Pages : 02

Total No. of Questions : 18

B.Tech. (ECE) (2012 to 2017) (Sem.-5)

DATA STRUCTURES

Subject Code : BTCS-304

M.Code : 70544

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A**Answer briefly :**

1. Define ADT.
2. How do you push and pop elements in a linked stack?
3. Prove that the number of odd degree vertices in a connected graph should be even.
4. Define NP hard and NP complete.
5. Define Binary Search Tree.
6. List out and define the performance measures of an algorithm.
7. What is Recursion? Explain with an example.
8. List out the various techniques of hashing.
9. What is the worst case complexity of Quick sort?
10. State the algorithmic technique used in merge sort.

SECTION-B

11. Give a function that uses a stack in order to reverse the elements of a circular queue which is stored in an array.
12. Write an algorithm/program to count the number of nodes in a given singly linked list.
13. Give the best case and worst case analysis of the binary search.
14. Write insertion algorithm for AVL tree. Write suitable rotation algorithms.
15. Explain external sorting. Give relevant example.

SECTION-C

16. Assume we have a priority queue split into several queues. To access these queues we have vectors of pointers to the front and rear of each queue and one to indicate the length of each. Thus to access the front of the queue representing priority 2, one merely starts at `PRIORITY_F[2]`. This representation allows each queue to be of different length. Given this representation, devise algorithms to insert and delete from a priority queue.
17. Write an algorithm/program to delete a node from a binary search tree.
18. Write an algorithm/program to implement radix sort.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.