Roll No. | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (Civil Engg. / Electrical Engg.) (Sem.–6)

DATA STRUCTURES & ALGORITHMS

Subject Code : BTCS-301-18

M.Code : 79259

Date of Examination : 14-07-22

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

1. Write briefly :

a. How can you differentiate stack from array?

b. What is importance of Asymptotic Notations for performance evaluation of an algorithm?

c. Define hash function with example.

d. Write various steps of linear search algorithm.

e. What are different types of graph traversal?

f. List applications of ADT queue.

g. What is time complexity of heap sort? Define heapify process.

h. What are the possible operations on Dequeue?

i. Differentiate between threaded binary tree and binary tree.

j. Which sorting algorithm uses recursive approach? List the name(s).

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SECTION-B

2. Explain insertion sort algorithm with a suitable example. What is the worst case and average case time complexity of this algorithm?

3. Write an algorithm to remove an element from binary search tree in a way that remaining tree remains a binary search tree.

4. What are the different operations possible on queue data structure? Write an algorithm to delete an element from queue.

5. Create a binary tree if following is given:

   In order traversal : f h i g b a d e c

   Pre-order traversal : a b f g h i c d e

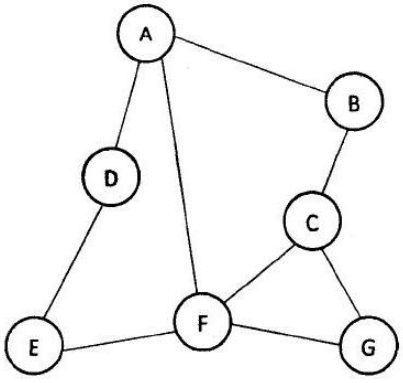
6. What is disadvantage of binary search? Write down its time complexity for different cases. Write down steps of binary search algorithm.

SECTION-C

7. What are the problems related to circular linked list? Specify the appropriate data structure which can overcome these problems. Using this data structure insert a node with information 'x' at a location 'i'.

8. What is hashing? Give characteristics of hash function. What is need of collision resolution in hashing and how it can be resolved? Discuss its techniques.

9. Represent following graph in adjacency list and explain how breadth first searching algorithm will be used to search an element? Discuss various performance issues of using search methodologies in a graph.



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.

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