

(Following Paper ID and Roll No. to be filled in your
Answer Books)

Paper ID : 131405

Roll No.

B.TECH.

Theory Examination (Semester-IV) 2015-16

DATA STRUCTURE

Time : 3 Hours

Max. Marks : 100

Section-A

Q1. Attempt all parts. All parts carry equal marks. Write answer of each part in short. (2×10=20)

- (a) What is an abstract data type? Is time and space complexity considered in defining ADT?
- (b) Perform evaluation of postfix expression using stack: $ABC + *DE / -$, where

$A=5, B=6, C=2, D=12, E=4$

(1)

P.T.O.

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0	1	0	0
0	9	0	0
0	0	0	0
5	0	0	0

- (f) Generate a binary search tree for the list - 53, 65, 86, 78, 5, 25, 34, 29
- (g) How will be the elements having same priority accessed from a priority queue?
- (h) How many pointers are contained as data members in the nodes of a circular doubly linked list of integers with five nodes?
- (i) Draw a directed weighted (assume random weights) graph having 5 vertices and each node having degree 4.

(2)

Q2. Attempt any five questions from this section.**(10×5= 50)**

- (a) Explain asymptotic notations. Discuss Big(O) notation.
- (b) Explain how polynomial can be expressed using linked list. Write a C program to add two polynomials using linked list.
- (c) Write a C program to implement stack using linked list and perform PUSH and POP operations onto the stack.
- (d) Explain the concept of circular queue. Discuss the base cases to be verified for carrying out insertion and deletion operations in a circular queue.

(3)

P.T.O.

- (f) What is tail recursion? Write a C program using recursive function that solves tower of Hanoi problem.
- (g) Draw Huffman tree and generate Huffman code for the following symbols whose frequency of occurrence in a message is stated along with symbols given below : Also estimate the total number of memory bits saved using the Huffman coding scheme.
- A:15 B:16 C:17 D:12 E:25 F:4 G:6 H:1 I:15
- (h) (a) Write a C program to search an element in array using binary search technique.

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- Q3. (a) What is the importance of Garbage Collection?
- (b) Write an algorithm to delete and insert elements in DEQUE.
- (c) Write an algorithm to delete last element from a doubly linked list.
- Q4. (a) Sort 20, 35, 40, 100, 3, 10, 15 using selection sort.
- (b) Explain with an example to find minimum cost spanning tree using Kruskal algorithm.

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Q5. (a) Generate a binary tree for the following traversal sequences given -

IN-ORDER : B F G H P R S T W Y Z

PRE-ORDER : P F B H G S R Y T W Z

(b) Write an algorithm to convert an infix expression into postfix form.

(6)

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