2019/TDC/ODD/SEM/ BCACC–301T/148

TDC (CBCS) Odd Semester Exam., 2019

COMPUTER APPLICATION

(3rd Semester)

Course No. : BCACC–301T

(Data Structures)

Full Marks : 50

Pass Marks : 20

Time : 3 hours

The figures in the margin indicate full marks for the questions

UNIT—I

1. Answer any *two* from the following questions : 2×2=4

(a) What is multidimensional array? Give example.

(b) Write an algorithm to traverse a linear array.

(c) Why is sparse matrix used?

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(2)

2. What is stack? What are the different types of operations that are performed on a stack? Also write down the algorithm of those stack operations. 1+1+4=6

OR

3. (a) Write down the algorithm to evaluate prefix expression. 3

(b) Consider the following stack of characters, where stack is allocated $N = 8$ memory cells—

STACK : A, C, D, F, K, _____, _____, _____

Describe the stack as following operations take place :

POP (STACK, ITEM)
POP (STACK, ITEM)
PUSH (STACK, L)
PUSH (STACK, P)
POP (STACK, ITEM)
PUSH (STACK, M)

When will overflow and underflow occur? 2+1=3

UNIT—II

4. Answer any *two* from the following questions : 2×2=4

(a) Write down the application of priority queue.

(3)

(b) What is deque? Mention its types.

(c) State the differences between array and Linked list.

5. (a) Write an algorithm to insert an element at the beginning of the list. 3

(b) What is circular linked list? How is circular linked list represented? Write down its advantages. 3

OR

6. (a) Define doubly linked list. 2

(b) Write an algorithm to implement queue using linked list. 4

UNIT—III

7. Answer any *two* from the following questions : 2×2=4

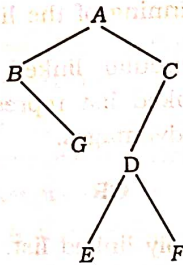(a) What is recursion? What are its properties?

(b) What is general tree? How does it differ from forest?

(c) If n be the total number of nodes in compute binary tree, what will be the height of the tree?

(4)

8. (a) How are binary trees represented in memory? Explain. 3

(b) Find the preorder, inorder and postorder traversal of the following binary tree : 3

OR

9. (a) Construct a binary search tree from the following node value : 3

40, 20, 60, 30, 10, 80, 50, 45, 55, 30

(b) What is threaded binary tree? Write down its advantages and disadvantages. 3

UNIT—IV

10. Answer any *two* from the following questions : 2×2=4

(a) Write down differences between linear search and binary search.

(Continued)

(5)

(b) Briefly explain the complexity of selection sort.

(c) Mention the drawbacks of shell sort.

11. Apply binary search technique to search 151, –14 and 9 from the following list of numbers : 6

–15, –6, 0, 7, 9, 23, 54, 82, 101, 112, 125, 131, 142, 151

OR

12. Explain insertion sort algorithm by taking suitable example. 6

UNIT—V

13. Answer any *two* from the following questions : 2×2=4

(a) What do you mean by hash function? Why is it necessary?

(b) When collision occurs? Give example.

(c) What is hash table?

14. What is rehashing? Explain how do you resolve hash clashes by open addressing method. 2+4=6

(Turn Over)

OR

15. Consider a hash table of size 10. Using linear probing, insert the keys :   6

72, 27, 36, 24, 63, 81, 92 and 101 into the hash table.

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