GBCS Scheme

USN

15CS33

Third Semester B.E. Degree Examination, Dec.2017/Jan.2018

Data Structures and Applications

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

Define data structures. Give its classification.

(06 Marks) (04 Marks)

b. Define structures with example.

Define pointers. Give advantages and disadvantages of pointers.

(06 Marks)

OR

Write a program to (i) reverse a string, (ii) concatenate two strings

(08 Marks)

Explain dynamic memory allocation in detail.

(08 Marks)

Module-2

a. Define stack. Implement push and pop functions for stack using arrays.

(08 Marks)

- b. Write the postfix form of the following expression: (i) $((6+(3-2)*4)^{5}+7)$
 - (ii) A \$ B \$ C * D

(08 Marks)

OR

- Define queues. Implement Qinsert and Qdelete function for queues using arrays. (08 Marks)
 - Define recursion. Write recursive program for (i) factorial of a number, (ii) tower of Hanoi.

(08 Marks)

Module-3

- Write the following functions for singly linked list: (i) Reverse the list (ii) Concatenate two lists. (08 Marks)
 - Write functions insert_front and delete_front using doubly linked list.

(08 Marks)

OR

Write an algorithm to add two polynomials.

(08 Marks)

Define sparse matrix. Give sparse matrix representation of linked list for given matrix.

$$A = \begin{bmatrix} 0 & 0 & 4 & 0 & 0 \\ 6 & 5 & 0 & 0 & 0 \\ 0 & 3 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 2 \end{bmatrix}$$

(08 Marks)

Module-4

- What is a tree? Explain:
 - Binary tree
 - ii) Strictly binary tree
 - iii) Complete binary tree iv) Skewed binary tree

(08 Marks)

Given inorder sequence: DJGBHEAFKIC and postorder sequence: JGDHEBKIFCA. Construct binary tree and give preorder traversal. (08 Marks)

Important Note: 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.

2. Any revealing of identification. appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

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OR

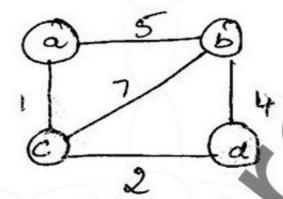
8 a. Explain threaded binary tree in detail.

(08 Marks)

b. Write a function to insert an item into an ordered binary search tree (duplicate items are not allowed) (08 Marks)

Module-5

9 a. Define graph. Give adjacency matrix and adjacency linked list for the given weighted graph in Fig.Q9(a).



OR

Fig.Q9(a)

(08 Marks)

b. Write an algorithm for breadth first search and depth first search.

(08 Marks)

10 a. Write an algorithm for Radix sort.

(08 Marks)

b. Explain Hashing in detail.

(08 Marks)

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