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UG/3rd Sem/CMS/(H)/T/19

2019

B.Sc.

3rd Semester Examination

COMPUTER SCIENCE (Honours)

Paper - C 5-T

Data structures

Full Marks : 40

Time : 2 Hours

The question are of equal value for any group/half. The figures in the margin indicate full Marks. Candidates are required to give their answers in their own words as far as parctiable. Illustrate the answers wherever necessary.

1. Answer any five questions :

5×2=10

- a) What is 'row major' ordering of an array ? Explain with a suitable example.
- b) What is an AVL tree?
- c) What do you mean by 'Abstract Data type' ? What are its differences with primitive data type ?
- d) Define B-tree.
- e) Construct an expression tree for the expression given below. (a<b) or (c<d)

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[Turn Over]

(2)

- f) Represent the following polynomial by a linked-list data structure. $5x^5 + 4x^2 - 25x + 10$.
- g) Differentiate between linear data structure and nonlinear data structure.
- h) What is the average case complexity of binary search ?

2. Answer any *four* questions :

4×5=20

- a) Write an non-recursive algorithm of quicksort. 5
- b) Construct a binary tree from the given postorder and inorder traversal.

Postorder : GHDEBLJFCA

Inorder : GDHBEAIFJC

Hence find its preorder traversal.

5

- c) Insert the following keys in the order given below to build them into an AVL tree : k, m, u, t, v, p clearly mention different rotations used and balance factor of each node. 5

- d) How to evaluate postfix expression using stack ? Illustrate the steps using the expression : 7 3 + 5

5

- e) Define binary search tree, Construct a Binary Search tree with the following data : 56, 58, 11, 40, 33, 90, 60, 100. 5

(3)

- f) Explain how to add a node in doubly linked list at any position. 5

Group - C

3. Answer any *one* question : 10×1=10

- a) (i) Write an algorithm for collision resolution using linear probing with open addressing in a hashed table $a(0).....a(m-1)$. 7
- ii) Write down the values of average number of probes. 3
- b) i) Write an algorithm to check whether a string is palindrome or not using a doubly linerlist. (Each node contains a single character). 7
- ii) What is the complexity of quick sort in worst best and average case complexity ? 3
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