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CS-62

BACHELOR OF COMPUTER APPLICATIONS (BCA) (Pre-Revised)

00670

Term-End Examination

December, 2017

CS-62 : 'C' PROGRAMMING AND DATA STRUCTURES

Time : 2 hours *Maximum Marks : 60*

Note : *Question number **1** is **compulsory**. Answer any **three** questions from the rest. All algorithms should be written nearer to 'C' language syntax.*

1. (a) What is a Binary Tree ? Construct the binary trees for the following Preorder and Inorder sequences : 8

Preorder : A B C E I F J D G H K L

Inorder : E I C F J B G D K H L A

(b) What is a height-balanced tree ? Construct an AVL tree for the following elements :

5, 9, 12, 10, 6, 1, 20, 8, 4, 15

Also explain its logic. 7

(c) Write a recursive program in C to generate Fibonacci series. 7

(d) Write an algorithm to traverse a graph using "Breadth First Search (BFS)" and also illustrate this algorithm with the help of an example. 8

2. (a) Explain commonly used techniques for Hashing. Describe collision in hashing. When are two keys called as synonyms ? 4

(b) Write an algorithm to implement quick-sorting technique. Also illustrate it with an example for ascending order. 6

3. (a) Define a stack. What are the various operations which can be implemented on a stack ? Write algorithms for them. 6

(b) Describe the following parameter passing mechanisms to functions : 4

(i) Call-by-Value

(ii) Call-by-Reference

4. (a) Using the file concept, write a program in C to create a new file, write some contents, close the file and set the permission mode as read-only. 5

(b) Write an algorithm to insert a node in a Binary Search Tree. 5

5. Write short notes on the following : $4 \times 2\frac{1}{2} = 10$

(a) Insertion Sort

(b) Circular Queue vs Linear Queue

(c) Indexed Sequential File Organization

(d) Switch-Case Statement in C