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CS-62

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

Term-End Examination

01521

June, 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) Write the following Infix expressions into Prefix notation : 7

(i) $x * y * * z - j / k * i + l$

(ii) $a + b * c / d - e * * f$

Note : Show step-by-step conversion process.

(b) Write an algorithm to traverse a Graph using Depth First Search (DFS) and also illustrate this algorithm with the help of an example graph. 8

(c) Write algorithms to perform the following operations in a Circular Queue :

(i) Create a circular queue with "N" elements. 3

(ii) Check whether the queue is empty or full. 3

(iii) Insert and delete an element. 3

(d) Write a C program using pointers, to swap the values of two variables x and y. Also, explain its logic. 6

2. (a) Write an algorithm to multiply two matrices A(m × n) and B(n × p) and store the product in matrix C. 5

(b) Write an algorithm to implement bubble sort. Illustrate this for the following list of numbers given below : 5

115, 6, 101, 3, 21, 44, 60, 4

3. (a) Write a recursive function to find out the "Greatest Common Divisor (GCD)" for 2 numbers given as input. 5

(b) Write a C program using structures, to generate pay-slips for 5 employees working in a retail medical store, if their Basic, DA, TA, Other Allowances and Deductions (Tax, LIC) are given as inputs. 5

Note : Assumptions, if any, can be made wherever possible, however list them.

4. (a) Illustrate how the elements of two-dimensional array would be stored in 6

(i) Row Major Order

(ii) Column Major Order

(b) With the help of an example graph explain the shortest-path problem's solution. 4

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

(a) Unions in C

(b) Spanning Tree

(c) Sparse Matrix

(d) Doubly Linked List