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MCS-011

MASTER OF COMPUTER APPLICATIONS (REVISED) (MCA)

Term-End Examination

December, 2021

MCS-011 : PROBLEM SOLVING AND PROGRAMMING

Time : 3 Hours *Maximum Marks : 100*

Weightage : 75%

Note : *Question No. **1** is compulsory. Answer any **three** questions from the rest.*

1. (a) Write an algorithm to convert a decimal number to its equivalent hexadecimal number. Also draw its corresponding flowchart. 10

   (b) Write a program to generate Fibonacci series using recursion. 10

   (c) What are the rules of using Big-O notation ? How the performance of the algorithms are measured ? 10

   (d) Write a program to search an element in a given list of 20 elements using linear search. 10

2. (a) Write a program to take a list of N numbers, separate even and odd numbers and put them in two separate files (even_file and odd_file). Use file handling concept. 10

   (b) Write a program to perform the following operation on matrices :

   $$D = A + (B * C)$$

   where A, B and C are matrices of 3×3 size and D is the resultant matrix. 10

3. (a) Write a program to convert lower case letters to upper case in a given string. 5

   (b) Explain switch statement with the help of a program segment. Also write its syntax. 5

(c) Write a program to award grades to students depending upon the criteria mentioned below : 10

Marks less than 40, 'E' grade.

Marks above 40 but less than 50, 'D' grade.

Marks above 50 but less than 60, 'C' grade.

Marks above 60 but less than 75, 'B' grade.

Marks greater than 75, 'A' grade.

4. (a) Write a program to demonstrate passing a structure to a function. 5

(b) Write a program to evaluate the following : 5

$$c = a^b.$$

(c) What are global variables and static variables ? Explain with the help of an example. 5

(d) How '# define' is used to create functional macros ? Illustrate with the help of a C program segment. 5

5. (a) Write a program to concatenate two strings without using the strcat( ) function. 10

(b) Differentiate between sequential and random access files. 5

(c) Write short notes on the following : 5

(i) Structure

(ii) Union