Dec.-22-1354

CS-101L (Computer Programming and Problem Solving)

B.Tech. 1st (CBCS)

Time : 3 Hours   Max. Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Candidates are required to attempt one question each from section ABCD. Question no. 9 is compulsory.

SECTION - A

1. (a) What is an algorithm and give its characteristics? Write an algorithm to find the factorial of a number.   (6)

   (b) Design an algorithm and draw a corresponding flowchart to convert a decimal number into octal number equivalent.   (6)

2. (a) Write an algorithm and draw a corresponding flowchart to check whether a number is prime or not.   (6)

   (b) Explain the hierarchy of computer memory and compare them.   (6)

SECTION - B

3. (a) Differentiate between call and return, call by value and call by reference. Explain using examples.   (6)

   (b) What is the difference between '&' and '&&' in 'C'? Explain with an example.   (4)

   (c) Write the equivalent C statement for the following equations.

   (i) $xy - \left[(p+q)^2 / r^2 \right]$

   (ii) $\dfrac{a^2 b^3 c^4 - d^4}{e(m \to n)}$ (2)

4. (a) Explain the differences between static, auto, register and global variables with an example for each.   (6)

   (b) What do you mean by scope of a variable? Differentiate between global and local variables by giving an example.   (4)

   (c) What is the structure of a C program and its life cycle?   (2)

SECTION - C

5. (a) Write an interactive program to find transpose of a matrix with proper validation and check.   (4)

   (b) Explain any four string functions with an example for each.   (4)

   (c) Explain the use of malloc(), calloc(), and realloc() and their syntax.   (4)

6. (a) Write a program to take two strings as input and append the second string to first string using array.   (4)

   (b) Design a flowchart to convert a given complete string to upper case.   (4)

   (c) 'C' program contains the following declaration:

   int arr[3] [2] = {{3, 1}, {4, 1}, {3, 2});

What is the value of the following :

(i) * (arr + 1)

(ii) * (* (arr) + 2) +1

(iii) * (* (arr) + 1)

(iv) arr (4)

SECTION - D

7. (a) Write a program to read a file and count the number of lines in the file. (should not use in-built functions). (4)

 (b) Explain the use of the following function:

  (i) fseek

  (ii) rewind

  (iii) ftell

  (iv) fwrite (4)

 (c) What is union? Give an example code segment to initialize the union and to access the member of a union. Mention the difference between structure and union. (4)

8. (a) Explain the meaning and usage of each of the following function prototypes:

  (i) getch( )

  (ii) strcmp( )

  (iii) getchar( )

  (iv) gets( )

  (v) puts( ) (4)

 (b) Suppose a file contains student's records with each record containing name and age of a student. Write a program to read these records and display them in sorted order by name. . (4)

 (c) Create a structure to specify data on students given below:

  Roll number, Name, Department, Course, Year of joining

  Assume that there are not more than 450 students in the college. Write a function to print the names of all students who joined in a particular year. (4)

SECTION - E (Compulsory)

9. (a) Write short note on header File.

 (b) What is data type?

 (c) Write the structure of nested if-else statement with example.

 (d) What is Ternary Operator? Write its significance.

 (e) Write brief note on dynamic allocation in C.

 (f) What are different modes of operation in file system in C. (6×2=12)