B. Tech.

(Semester II) Even Semester Theory Examination, 2012-13

COMPUTER CONCEPTS & PROGRAMMING IN C

Time: 3 Hours
Note: Attempt questions from each Section as per instructions.

Section-A

Attempt all parts of this question. Each part carries 2 marks. 2 x 10 = 20

1. (a) What is the role of SWITCH statement in C programming language?
(b) List the characteristics of an Algorithm.
(c) What are the differences in Array and Structures?
(d) Compare Stack and List.
(e) What is the difference between pass by value and pass by reference?
(f) Differentiate the following:
   (i) Unary Operator and Binary Operator.
   (ii) Local variables and Global variables.
(g) Is there any operator in 'C' that allows a three-way transfer of control? Give example.
(h) What are the advantages of using pointers?
(i) What is the need of dynamic memory allocation?
(j) Differentiate between structure and union.

Section-B

Attempt any three parts of this question. Each part carries 10 marks. 10 x 3 = 30

2. (a) (i) Give the architectural diagram of a computer. Explain the role of a control unit.
   (ii) What do you understand by loading and linking of a program?
(b) Develop a flowchart and then write a 'C' program to sort strings passed to the program through the command line arguments. Also display the sorted strings.
(c) While purchasing certain items a discount of 10% is offered if the quantity purchased is more than 2000. Write a program to calculate the total expenses, if quantity and price per item are entered through keyboard.
(d) Define a structure for a student having name, roll number and marks obtained in six subjects. Write a program to input the details for 20 students and print the details of the students who have scored more than 70% marks overall.
The nth Fibonacci number is defined by:
1 if n is 1
I if n is 2
The sum of the previous two Fibonacci numbers otherwise. Write a recursive function in C to compute the nth Fibonacci number.

Section-C

Attempt all questions of this Section. Each question carries 10 marks. 5x2x5 = 50

3. Attempt any two parts:
(a) Explain the difference between a compiler and an interpreter.
(b) Differentiate between a zero argument function and a parameterized function.
(c) Differentiate between a subroutine and a function with examples.

4. Attempt any two parts:
(a) Discuss how following functions are used in files:
    fopen(), getc(), putc(), fclose().
(b) How many types of logical operators are there in 'C' programming language? Write about these giving suitable examples.
(c) How is a string stored in memory? Is there any difference between string and character array?

5. Attempt any two parts:
(a) Write a program to add two matrices of dimension 3x4 and store the result in another matrix.
(b) Write a C program fragment using “for loop” construct to print even numbers between 10 and 100 making sure that two numbers are written per line.
(c) Give the output of the following program:

```c
main()
{
    int y=0;
    unsigned int x=0;
    while (x != 0)
    {
        x <<= 1; y++;
    }
    printf("the value of y is \"%d\", y);
}
```

6. Attempt any two parts:
(a) Write a C function using pointers to exchange the values stored in two memory locations in the memory.
(b) What is the purpose of the break statement? Within which control statements can the break statement be included?
(c) Given are two one-dimensional arrays A and B which are stored in ascending order. Write a program to merge them into a single sorted array C that contains every element of A and B in ascending order.

7. Attempt any two parts:
(a) Write a program that accesses the array element using pointer variable.
(b) Write a C program to find if a number is present in a list of N numbers or not.
(c) Differentiate between run-time errors and logical errors.