

## ALCCS – (OLD SCHEME)

Code: CS11

Subject: COMPUTER PROGRAMMING &  
PROBLEM SOLVING THROUGH C

Time: 3 Hours

Max. Marks: 100

**MARCH 2011**

NOTE:

- Question 1 is compulsory and carries 28 marks. Answer any FOUR questions from the rest. Marks are indicated against each question.
- Parts of a question should be answered at the same place.

Q.1 a. Describe the output that will be generated by the following 'C' program.

```
#include <stdio.h>
int main()
{
    int a[5] = {1,2,3,4,5};
    int *ptr = (int*)&a+1;
    printf("%d %d", *(a+1), *(ptr-1) );
    return 0;
}
```

b. Write a C program to add two numbers using pointers.

c. Distinguish between Automatic and Static variables

d. What is the following function computing? Assume x and n are positive integers.

```
int mystery ( int x , int n)
{
    int val;
    val =1;
    if (n>0)
    {
        if (n%2 == 1)
            val = val *x;
        val = val * mystery(x*x , n/2);
    }
    return val;
}
```

e. What will be the output of the following code segment? Explain.

```
include <stdio.h>
int main()
{
    int i=3;
    int j;
    j = sizeof(++i + ++i);
    printf(" i = %d\n\n j = %d", i ,j);
    return 0;
}
```

- f. Define a macro. Write a nested macro that gives the minimum of three values.
- g. Differentiate between a compiler and an interpreter. (7×4)
- Q.2** a. What do you understand by stepwise refinement of the program? Compare Top-Down and Bottom-Up strategies to solve a problem. (6)
- b. What is a recursive function? What is the advantage of using recursive function? Write two C programs that calculate factorial of a number using recursion and iteration? Compare two approaches. (12)
- Q.3** a. Write a function to remove duplicates from an ordered array. For example, if input is: a,a,c,d,q,q,r,s,u,w,w,w,w; then the output should be a,c,d,q,r,s,u,w. (9)
- b. Write a function to sort the characters of the string passed to it as argument. (9)
- Q.4** a. Write a complete C program for reading an employees file containing {emp\_number, name, salary, address}. Create an output file containing the names of those employees along with their salary and address whose salary is > 30,000. (9)
- b. Distinguish between the following giving suitable example:  
 (i) Call by value and Call by reference  
 (ii) Global and local variables.  
 (iii) do..while and while loops (9)
- Q.5** a. Define a structure. How it is different from union? Explain the differences by giving suitable examples. (6)
- b. What are preprocessor directives? List three types of them. What is the difference between the following directives: #include <filename> and #include "filename"? (6)
- c. Write a function to delete a specified node from linked list. (6)
- Q.6** a. What is insertion sort? Write a program in C to sort the given list of integers using insertion sort. (6)
- b. Differentiate between White Box and Black Box Testing. (6)
- c. Explain Testing and debugging process briefly. (6)
- Q.7** a. Discuss the kind of errors those are likely to be present in a program. (6)
- b. Explain the following functions giving a small C code snippet:  
 (i) feof() (ii) ftell()  
 (iii) fseek() (iv) ferror()  
 (v) malloc() (5)
- c. Write a C program to multiply two matrices (maximum size of the two matrices is 20 × 20 each). (7)