ROLL NO. _____

ALCCS - OLD SCHEME

Code: CS11 **Subject: COMPUTER PROGRAMMING & PROBLEM SOLVING THROUGH C**

Time: 3 Hours **Max. Marks: 100**

AUGUST 2011

NOTE:

- **Please write your Roll No. at the space provided on each page immediately after receiving the Question Paper.**
- **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. Define macro. Also design a macro to find the smallest number among 3 given numbers.

b. What would be the output of the program given below?

```
typedef struct soldier
{
char *name;
char *rank;
int serial_number;
} SOLDIER;
SOLDIER soldier1, soldier2, soldier3, *ptr;
ptr = &soldier3;
soldier3.name = "Anand Mohanti";
printf("\n%s", (*ptr).name);
printf("\n%c", *ptr->name);
printf("\n%c", *soldier3.name);
printf("\n%c", *(ptr-> name + 4));
```

c. Differentiate between call by value and call by reference giving suitable example.

d. 'C' is a block structured language. What is the use of this? Give an example to illustrate this.

e. What are the different kinds of decision statements available in 'C'?

f. Differentiate between syntax errors and execution errors.

g. Define a structure to store the following information about an employee
Name, Sex(male, female), Marital_status(single, married, divorced or widowed), age(using bit fields) **(7×4)**

Q.2 a. Given two one-dimensional arrays A and B, which are sorted in ascending order. Write a program to merge them into a single sorted array C that contains every item from arrays A and B in ascending order. **(8)**

b. Write a function to display the binary number corresponding to the integer passed to it as an argument. **(10)**

Q.3 a. What is black box testing? Briefly explain the various black box test design techniques. **(9)**

b. Write a function to sort the characters of the string passed to it as argument. **(9)**

Q.4 a. A file of employees contains data (eno, name and salary) for each employee of a company. Write a program to do the following:
(i) create the file
(ii) insertion in a file
(iii) deletion from a file
(iv) modification in a file **(12)**

b. Distinguish between the following:
(i) Automatic and static variables
(ii) Global and local variables. **(6)**

Q.5 a. Give the outputs of the following code segments, if any and justify your answers. **(12)**

(i)
```
#define CUBE(x) (x * x * x)
main( ) {
printf("%d", CUBE(4+5));
}
```

(ii)
```
int k,j = 5;
printf("%d", k = j == 6);
printf("%d", k = ++j == 6);
```

(iii)
```
for (j = 0; j = 3; j++)
printf("%d", j);
```

(iv)
```
main( ) {
static char a[ ] = "Test String";
static char *b = "Test String";
printf("%d %d", sizeof(a), sizeof(b));
}
```

(v)
```
main( ) {
enum test {RED, BLUE, GREEN};
enum test t = BLUE;
printf("%d", t);
}
```

(vi) main( ) {
union U { int j; char c; float f; } u;
u.j = 10; u.c = 'A'; u.f = 99.99;
printf("u.j = %d u.c = %c u.f = %f", u.j, u.c, u.f);
}

b. What are preprocessor directives? List three types of them. What is the difference between the following directives: #include <filename> and #include "filename"? **(6)**

Q.6 a. Write a program to create a matrix m×n using dynamic memory allocation then find the transpose of this matrix. **(10)**

b. Write a C program to create a file contains a series of integer numbers and then reads all numbers of this file and writes all odd numbers to other file called odd and writes all even numbers to a file called even. **(8)**

Q.7. Write short notes on any **FOUR** of the following:

(i) Divide and Conquer strategy
(ii) Algorithms and its characteristics
(iii) Recursion
(iv) Advantages and disadvantages of using functions
(v) Storage classes in C **(4½×4)**