9. (a) State the difference between the file open modes "r" and "r+".

(b) Write a C program to copy the contents of a file to another file where names of both files are supplied from the command line.

(c) Explain with an example the utility of the function feof( ).

2 + 7 + 3 = 12

INTRODUCTION TO PROGRAMMING
(MCAP 1102)

Time Allotted : 3 hrs **Full Marks : 70**

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.

Candidates are required to give answer in their own words as far as practicable.

Group – A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**

(i) What will be the output of the following C code segment?

```
#define CUBE(x) x * x * x
int main ( )
{
  printf ("%d", CUBE (2 + 3));
       return 0;
}
```

(a) 17 (b) 125 (c) 35 (d) 18.

(ii) For the statement below, assume that x=50 before execution of the statement. Find, what is the value of y after execution?

```
y = x = = x++;
```

(a) 0 (b) 1 (c) 51 (d) 50.

(iii) The expression 4 + 6 / 3 * 2 – 2 + 7 % 3 evaluates to

(a) 7 (b) 6 (c) 4 (d) 3.

(iv) If a two dimensional array int a[10] [20] is represented as an array of pointers, then the element a[4][5] can be denoted by

(a) *(a + 4) + 5 (b) *a[4] + 5
(c) *(*(a + 4) + 5) (d) a[4] + 5.

(v) Which of the four assignments is valid after the following declaration?

```
int A[10], B[20], *C;
```

(a) A = B (b) B = C (c) A = C (d) C = A.

(vi) The default value of a static variable is
(a) 1 (b) 0 (c) -1 (d) garbage value.

(vii) Which of the following takes the string s1 and copies it into string s2?
(a) s2 = (char*) s1 (b) strcpy(s1, s2)
(c) strcpy(s2, s1) (d) s2 = strcpy(s1).

(viii)
```
enum colors {BLACK, BLUE, GREEN}
main()
{
   printf("%d..%d..%d", BLACK,BLUE,GREEN);
   return(1);
}
```
(a) BLACK..BLUE..GREEN (b) 1..2..3
(c) 0..1..2 (d) Compilation Error.

(ix) If there is any error while opening a file, what will *fopen()* return?
(a) 1 (b) NULL (c) EOF (d) -1.

(x) Which of the following is the correct usage of conditional operators used in C?
(a) `a>b ? c=30: c=40;` (b) `a>b ? c=30;`
(c) `z = a>b ? a>c? a:c:b>c? b:c;` (d) `return (a>b)?(a:b);`

Group – B

2. (a) Summarize the rules for naming identifiers in C language.

(b) Draw a flowchart to find whether a number entered by the user is prime.

(c) When writing integer constants in C language, how are decimal constants, octal constants and hexadecimal constants distinguished from one another?

4 + 5 + 3 = 12

3. (a) During the compilation process, what happens to symbolic constants that appear within a C program?

(b) Show the memory content of $(27.3125)_{10}$, using IEEE 754 floating point (32 bits) representation.

(c)
```
int main()
{
    char c = 'A';
     int x=c;
     x = x<<2;
    printf("%d",x);
    printf("%d",x/2 + ++x);
    print("%d",x%200);
    return 0;
}
```

(d) State the difference between casting with an example.

3 + 3 + 4 + 2 = 12

Group – C

4 .(a) Write a program in C which takes as input an integer and prints the sum of the digits of the input and also the number of digits in the input.

(b) Write down a function in C that takes *x* and *n* as inputs, and then find the value of the following series up to *n* terms :

$$1 - \frac{x^2}{3!} + \frac{x^3}{5!} - \frac{x^4}{7!} + \frac{x^5}{9!} - \cdots$$

4 + 8 = 12

5. (a) Explain the use of break and continue statement in loops with example.

(b) Differentiate among function definition, function call and function declaration.

(c) Write a C program using recursion to reverse an integer number NUM and check whether it is PALINDROME or NOT.

4 + 3 + 5 = 12

Group – D

6. (a) If an array is passed to a function and several of its elements are altered within the function, are these changes recognized in the calling portion of the program? Explain.

(b) Write a program in C to find the product of two matrices. First input the matrices, print them in matrix format, then check whether multiplication is possible or not; if possible, multiply the matrices and print the result in matrix format, otherwise print proper message.

5 + 7 = 12

7. (a) How can a list of strings be stored within a two-dimensional array? How can the individual strings be processed?

(b) Write program in C that takes a name, consisting of Firstname and Surname, as input to a single string and generates a gmail id - SurnameFirstname@gmail.com. For example, if the input is Sachin Tendulkar the output will be TendulkarSachin@gmail.com. *(you are not allowed to use any function of string.h)*.

4 + 8 = 12

Group – E

8. (a) Write a program in C that defines SCUBE(a, b), a macro, as a3+ b3 and test the program to find SCUBE(4, 5 + 6).

(b) The time at a given instance has three elements hours, mins and secs. Write a program to add two times. Use a function to add the times and return result.

5 + 7 = 12