

CODE: 17CF00102

MCA I Year I Semester Regular Examinations, December 2017
INTRODUCTION TO PROBLEM SOLVING AND PROGRAMMING

Time: 3 hours

Max Marks: 60

Answer all **five** units. (5 x 12 = 60 Marks)

UNIT-I

1. a) What is top down analysis? Describe the steps involved in top down analysis
b) Device an algorithm to reverse the digits of a number

OR

2. a) Draw a flow chart to find the factorial of a given number.
b) What is an algorithm? List the key features of an algorithm. Give one example.

UNIT-II

3. a) Explain the following with one example each Arithmetic Operators, Relational Operators and Logical Operators
b) Depict the output for the following

```
i)main()
{
int i=5;
printf(“%d %d %d”, i++, i ,++i);
}
```

```
ii)main()
{
int a;
a=2*3+4%5-3/2+6;
printf(“%d”, a);
}
```

```
iii)main()
{
int i=10, j=11,k,l;
k=i+ ++j;
l=i++ + ++j;
printf(“%d %d”, l,k);
}
```

```
iv)main()
{
int x=20, y=35;
x=y++ + x++;
y=++y + ++x;
printf(“%d%d”, x,y);
}
```

OR

4. a) Describe the step by step process of executing the C Program.
b) List and describe the various data types supported by C Language along with their size in bytes

UNIT-III

5. a) Develop a C program to find the sum of the diagonal elements of a given square matrix.
b) Differentiate while and do-while loop using flow chart and also provide suitable example for each.

OR

6. a) Develop a C program to check whether the given number is a palindrome or not.
b) What are arrays? How 1-d and 2-d arrays are declared and initialized. Give example for each

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UNIT-IV

7. a) Define recursion. Making use of recursion find the factorial of a given number
b) Define a structure by name 'complex' consisting of real and imaginary parts of a Complex number. Write a C program to add two such complex numbers

OR

8. a) Write a short note on the following
i. structure with in a structure
ii. array of structures
b) Illustrate the properties of automatic, external and static storage classes

UNIT-V

9. a) Discuss the following dynamic memory allocation functions
i. malloc()
ii. calloc()
iii. realloc()
b) Develop a program to copy content of one file to another, replacing all lowercase characters with their uppercase equivalents.

OR

10. a) Discuss the following with suitable examples.

i. Array of pointers ii. Pointer to function

- b) Define File and File Pointer? Explain different functions used for the following File operations with the help of appropriate examples.
