Reg.No.:

**Question Paper Code: 5024**

B.E. / B.Tech DEGREE END-SEMESTER EXAMINATIONS – DECEMBER 2019

First Semester

Computer Science and Engineering

U19CS101 – PROGRAMMING FOR PROBLEM SOLVING

(Common to Electrical and Electronics Engineering, Electronics and Communication
Engineering, Information Technology & Biotechnology)

(Regulation 2019)

Time : Three Hours                                    Maximum : 100 Marks

Answer ALL the questions

PART – A

(10 x 2 = 20 Marks)

1. Differentiate compiler and interpreter.

2. Draw a flowchart for getting two numbers from the user and print the average of those two numbers.

3. Are the following statements valid? Also, predict the output with proper justification. For running this, what statement should be entered as input, to store 10, 20, 30, respectively in a,b, and c?

    *char value=65;*

    *scanf("%dAND%dAND%d",&a,&b,&c);*

4. What is the function of **continue** statement?

5. Predict the output with proper justification:

    *char virtue[20]="honesty wisdom";*

    *printf("Value=%d",printf("%d",strlen(virtue)));*

6. Predict the output with proper justification:

    *void main()*

    *{   char \*a= "computer";*

    *char \*b=a;*

    *printf("%c\t%c\n", \*(b+3),a[1]);*

    *}*

1

7. What is the value returned by func(8)? Give proper justification.

```
int func(int num)
{
int count = 0;
while(num)
{
count++;
num>>=1;
}
return(count);
}
```

8. Predict the output with proper justification.

```
int main()
{
int val=99, *ptr=&val;
fun(&ptr); printf("%d",*ptr);
}
void fun(int **ptr)
{
int val=98;
*ptr=&val; printf("%d",**ptr);
}
```

9. Write a main function to update the member variables of the following structure using the pointer variable **point**.

```
struct coordinate{ int xcord, ycord; char *cord_name;
}*point;
```

10. Differentiate between Structure and Union in C.

PART – B

(5 x 13 = 65 Marks)

11. a) Given a sequence of n integers, (containing both positive and negative integer values) design an algorithm to find and print the maximum length sequence having only positive integers.

(OR)

b) Given two sets of integers, A = $\{a_1, a_2,...,a_n\}$ and B = $\{b_1,b_2,...,b_m\}$, design an algorithm to compute and print the intersection and union of A and B.

2

12. a) Convert the input date in DD/MM/YYYY to Month Day, Year format. (Hint: use switch statement or if... else statement. e.g. 05/01/2009 to January 05, 2009)

(OR)

b) Determine the number of positive integers less than 101 which is either a multiple of 3 or a multiple of 5 using a C program. Verify the result using the principle of inclusion and exclusion in the same program.

13. a) Write a C program to check whether a string is palindrome or not (the string is same as its reverse). e.g. 'madam' is a palindrome string.

(OR)

b) Write a C program to accept two strings A and B and check whether A is a substring of B. e.g. 'gram' is a substring of 'programming', whereas 'ping' is not.

14. a) i. What are storage classes? Elaborate with examples. (5)
   ii. Write a recursive function to find the factorial of a given number. (8)

(OR)

b) i. Differentiate between actual and formal parameters with examples. (3)
   ii. Write a function to find the maximum among an array of 'n' integers. Call this function repeatedly to sort given n integers.

(10)

15. a) Use a self referential structure to create a linked list of nodes. Also, create functions to perform insertion of a new element at the end, and deletion of an element from the beginning of the list.

(OR)

b) You are given a nested structure as follows:

*struct employee*

*{*

*int emp_id; float salary; struct emp_date date_of_birth;*

*char name[50];*

*}*emp_ptr;*

*struct emp_date*

*{*

*unsigned int day,month,year;*

*}*

Create 'n' (user input) employee records using the pointer variable and update the employee details using user input.

### PART – C

(1 x 15 = 15 Marks)

16. a) Design and implement an algorithm for creating a linked list of 'n' (user input) integers, and find the most frequent integer in the list. (Note: Write the program as menu driven.)

(OR)

b) Design and implement an algorithm to print the following pattern for 'n' lines. Take n as input from the user. When n=4, the pattern is as shown below.

```
* *
* * * *
* * * * * *
* * * * * * * *
```