Rajiv Gandhi Institute of Petroleum Technology, Jais Amethi

B. Tech 1st year (CSD+CSE+CSE-IDD+EE+IT+MC)

Mid-sem Examination 2022-23

Instructors- Dr. Daya Sagar Gupta/Dr. Niraj Kumar/Dr Pallabi Saikia

Subject: Computer Programming **Course Number**: CS101

Date & Time: 30-12-22, 10:00 AM to 12:00 AM **Total Marks:** 60

INSTRUCTIONS

I. There are 9 questions in this paper. All questions are COMPULSORY.
II. Marks are indicated against each question.
III. Attempt the questions in serial order (if possible).

1. Write a short note with appropriate examples on the following. [3X4]

a. `break` and `continue` statements
b. `while` and `do-while` loops
c. `fgetc()` and `fputc()`
d. End of file (`EOF`)

2. Answer the following in the context of corresponding code given below. [3X4]

a. Write the role of variable `A` and final value of `A`.

```
int A=0, X = 9876;
do{
      X /=10;
      A++;
}while(X != 0);
```

b. All values of `x`.

```
int x=11, i=0;
while(i<=3){
      if (x >10)
            x-=10;
      else if(x>=0)
            x+=5;
      else
            x-=5;
      i++;
      printf("%d", x);
}
```

c. Output of `fun()`.

```
int fun (int n){
      int i, j, sum = 0;
      for(i = 1; i<=n; i++)
            for(j=i; j<=i; j++)
                  sum=sum+j;
      return(sum);
 }
```

d. Output/error in the following.

```
#include <stdio.h>
int fun(int k){
      printf("%d\n",k);
      k++;
      return 1;
}
int main(){
      int i = 2;
      printf("%d", fun(i++)*i);
}
```

3. Write a C program to read a four-digit integer from the user in the `main()` function. Write (and call) a function `prod(arguments)` to compute and print the product of the digits of this number. Likewise, write a function `reverse(arguments)` to reverse the order of digits and print the reversed number. [5]

4. Explain the use of nested `if-else` statements. Write a program to check whether a triangle is Equilateral, Scalene, or Isosceles, accepting the sides from the user. [5]

5. Discuss passing 1-D and multidimensional arrays as arguments to a function. Compute and print the average of all the elements of an 1-D array by passing it to a function. [5]

6. What is recursion? Explain. Write a C program using a recursive function for Binary to Decimal conversion. [5]

7. A character array is a string and vice-versa. Prove/disprove with examples. What is `strlen()` function? Write your own version of `strlen()` function. [5]

8. What is a pointer? Explain how a pointer variable is declared and initialized. Explain the call by value and call by reference using pointers with an appropriate example. [5]

9. What is a structure? Explain C syntax of structure declaration with appropriate examples. Write a C program to declare a structure to store roll number (an integer), name (a string) and marks in a subject (a real-number). Read these details from the user to store in an array of structures for 50 students in a class. Compute the average marks in the class. Display the students (name and roll number) scoring above and below the average marks. [6]

========== End of the Question Paper ==========