

Rajiv Gandhi Institute of Petroleum Technology, Jais Amethi

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

Mid-sem Examination 2021-22

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

Subject: Computer Programming

Course Number: CS101

Date & Time: 17-01-22, 9:30 AM to 11:30 AM

Total Marks: 60

INSTRUCTIONS

- I. There are 12 questions in this paper.
 - II. All questions are COMPULSORY.
 - III. Each question carries 5 Marks only.
 - IV. Copied answers will not be evaluated.
 - V. Give proper explanation for all the questions. Writing only answers directly will not be considered.
 - VI. Attempt the questions in serial order (if possible).
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1. Write a C program to print the diameter, circumference, and area of a circle by accepting the radius from the user. [5]
 2. Draw the flowchart to compute Fibonacci series and also write a C program to print the Fibonacci series of the given number. [5]
 3. What do you mean by passing a single and multidimensional array as a parameter in a function? Write a function to find out the average of all the elements of an array which has been passed to this function. [5]
 4. Write a C program with `main()`, `reverse()`, and `prod()` functions. The `main()` function will receive an integer of 4 digits from the user and call `reverse()` and `prod()` functions (with the integer inputted by the user as an argument), subsequently, these functions will print the reverse order of digits and product of its digits, respectively. [5]
 5. Write a C program with two functions `main()` and `compute()`. The `main()` function is supposed to receive an array from the user as an input. Moreover, `main()` function will

declare required number of pointers and call the `compute()` function (with the required number of arguments) to find out (1) largest element of the array, (2) smallest element of the array, and (3) if there are any duplicate elements in the array which will be indicated by a variable `dup1 = 1`, otherwise `dup1 = 0`. Note that, `compute()` function should not return any value. [5]

6. Report the output of the following code snippets. Indicate the line number along with the reason of the error(s), if any. [1X5 = 5]

a.

```
#include <stdio.h>

int fun(int i){
    return i++;
}

int main(){
    int i = 2;
    printf("%d\n",    fun(i++) + i + ++i);
}
```

b.

```
#include <stdio.h>

int fun(int *i){
    return ++(*i);
}

int main(){
    int i = 2;
    printf("%d\n",    fun(&i) + i + ++i);
}
```

c.

```
int _i = 2;
int i& = 5;
int #i = 3;
int i$i = 4;
int _t_ = 6;
```

d.

```
#include <stdio.h>
int main(){
    int i = 5;
    int j = 4;
    int k = 7;
    printf("%d", j > k ? (i > j ? 1: 0) : (i > k ? 1 : 0));
}
```

e.

```
#include <stdio.h>

int main(){
    int i = 1, j = 5;
    for(;++i<=10;i++,j--){
        printf("%d\t%d\n",i,j);
    }
}
```

7. Explain the role of the **break** and **continue** statements with a suitable C example. Write a program for a grading system using **switch case**, to print the grade as A+ if percentage is greater than 90%, A if greater than 80%, B if greater than 70%, C if greater than and equal to 60% and at last, D for less than 60%. [5]
8. State the difference between the **while** and **do-while** loops with a suitable example. Rewrite the following code snippet to achieve the same functionality, however, using a **while** loop. [5]

```
for(i = 0; i < 10; i=i++){
    printf("Number = %d\n",i);
}
```

9. Explain the prefix and postfix increment and decrement operators with appropriate examples. Write a program to print the prefix increment and postfix decrement for the value of x=7. [5]

10. Write a program which accepts the sides of a triangle from the user and checks whether the triangle is Equilateral, Scalene, or Isosceles. [5]

11.

- a. Find the output of the following program. [2.5]

```
#include <stdio.h>

int main(){
    int p = 4, q, r;

    q = p = 15;
    r = p < 15;

    printf("p = %d q = %d r = %d\n", p , q , r);

    return 0;
}
```

- b. Write a program to print the following triangle. [2.5]

```
101010
10101
1010
101
10
1
```

12. Find the output of the following Programs. [2X2.5=5]

- a. What `sum1` and `sum2` represent in the following program? What will be the value of `sum1` and `sum 2`, if the upper limit is 51. [2.5]

```
#include <stdio.h>
int main(){

    int i, n, sum1 = 0, sum2 = 0;

    printf("Enter upper limit: ");
    scanf("%d",&n);

    for(i = 1; i <= n; i += 2){
        sum1 = sum1 + i;
    }
    printf("%d\n",sum1);

    for(i = 0; i <= n; i += 2){
        sum2 = sum2 + i;
    }
    printf("%d\n",sum2);

    return 0;
}
```

- b. What will be the output of the following program ? [2.5]

```
#include <stdio.h>
int main(){
    int x;
    x = 10;

    if (x > 10)
        x -= 10;
    else if (x >= 0)
        x += 00;
    else if(x)
        x += 10;
    else
        x -= 10;
    printf("%d\n",x);

    return 0;
}
```