INDIAN INSTITUTE OF INFORMATION TECHNOLOGY, NAGPUR
Department of Computer Science and Engineering
Computer Programming (CSL 101, Core)
Sessional-1 Examination

Date: 20/12/2022
Duration: 1 Hour
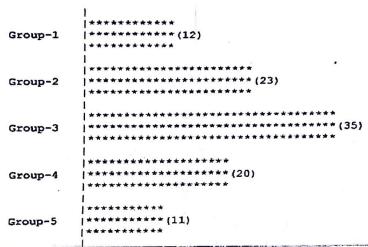
Marks: 15

Important Instructions:
- All the questions are compulsory.
- Maximum marks for a particular question is indicated on the extreme right of the corresponding question within the brackets [ ].

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1. Determine the output of the following C program.

[05]
[CO1]

(a)
```c
int main(){
    int i = -5;
    while (i <= 5) {
        if (i >= 0)
            break;
        else
        {
            i++;
            continue;
        }
        printf("India");
    }
    return 0;
}
```

(b)
```c
int main(){
    float sum = 0.0, j = 1.0, i = 2.0;
    while (i/j > 0.0625)
    {
        j = j + j;
        sum = sum + i/j;
    }
    printf("%f\n", sum);
    return 0;
}
```

(c)
```c
int main() {
    int a = 10, b = 20, c = 30, result;
    result = ++a * b++ + ++c;
    printf("%d", result);
    return 0;
}
```

(d)
```c
int main()
{
    int i = 0;
    for (i=0; i<25; i++)  {
        switch(i)
        {
            case 0:
                i += 5;
            case 1:
                i += 2;
            case 5:
                i += 5;
            default:
                i += 4;
            break;
        }
        printf("%d ", i);
    }
    return 0;
}
```

(e)
```c
int main() {
    int i,j;
    for(i=6;i>0;i--)
    {
        for(j=1;j<i;j++)
            printf("%d",j);
        printf("\n");
    }
    return 0;
}
```

2.

a) Write a computer program to compute the digital root of the positive integer number. The digital root of a positive integer is found by adding the digits of the integer until the sum becomes a single digit.
For example: if a number is 12345 do 1+2+3+4+5=15. 15 is not a single digit, so repeat. 1+5=6. As 6 is a single digit, the answer is 6.

[2]
[CO2]

b) In an organization, the employees are grouped according to their basic pay for the purpose of certain perks. The pay-range and the number of employees in each group are as follows:

[2.5]
[CO2]

Group	Pay-Range	Number of Employees
1	750-1500	12
2	15001-3000	23
3	3001-4500	35
4	4501-6000	20
5	Above-6000	11

Draw a histogram to highlight the group sizes. For Example, the following histogram is generated when the following inputs are given.

```
Enter employees in Group -- 1 : 12
12
Enter employees in Group - 2 : 23
23
Enter employees in Group - 3 : 35
35
Enter employees in Group - 4 : 20
20
Enter Employees in Group - 5 : 11
11


          |
          |************
Group-1   |************(12)
          |************
          |
          |***********************
Group-2   |***********************(23)
          |***********************
          |
          |***********************************
Group-3   |***********************************(35)
          |***********************************
          |
          |********************
Group-4   |********************(20)
          |********************
          |
          |***********
Group-5   |***********(11)
          |***********
          |
```

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3. a) A Car Manufacturing company has classified its executives into four levels for the benefit of certain perks. The level and the corresponding perk are shown below **[3] [CO2]**

Level	Perks	
	Conveyance allowance	Entertainment allowance
1	1000	500
2	750	200
3	500	100
4	250	--

An Executives gross salary includes basic pay, house rent allowance at 30% of basic pay and other perks. Income tax is withheld from the salary on percentage basis as follows:

Gross Salary	Tax rate
Gross <= 3000	No tax deduction
3000 < Gross <= 5000	4%
5000 < Gross <= 6000	6%
Gross > 6000	9%

Write a program that will read an executive's job number, level number and basic pay and then compute the net salary after withholding income tax.

b) Write a C program to print the hollow star pattern as depicted in the figure. Input to the program will the number of rows of the hollow star pattern. For example, the following pattern is generated when the number of rows is 5. **[2.5] [CO2]**

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