



School of Computer Science Engineering and Information Systems
Winter Semester 2023-2024
Continuous Assessment Test – I

Programme Name & Branch: B.Tech IT

Course Name & code : Structured and Object Oriented Programming BCSE 102L

Class Number (s) : VL2023240503283, VL2023240503282, VL2023240503270

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Exam Duration : 90 Min. Maximum Marks: 50

Answer Key

1) Calculate the electricity bill according to the following rates

a) For first 100 units : 30p per unit

b) For next 200 units : 50p per unit

c) Above 300 units : 70p per unit

If the total bill amount is more than Rs.250.00 then additional charges of 20% of total bill amount is accounted and added in the Final Bill amount.

All users are charged a minimum of Rs.200.

Write a C program to read the names of users and number of units consumed to account and print out the charges for 'n' users as follows:

S.No	User Name	Units consumed	Bill Amount
1	XXX	250	305
2	YYY	400	400

Answer (Each Colour Code has 2 marks)

```
#include<stdio.h>
```

```
main()
```

```
{
```

```
    int n;
```

```
    printf("\nEnter the value of n:");
```

```
    scanf("%d",&n);
```

```
    char name[n][20];
```

```
    float ncost[n],cost[n],units[n];
```

```
    for(int i=0;i<n;i++)
```

```
    {
```

```
        printf("Enter the name:");
```

```
        scanf("%s",&name[i]);
```

```
        printf("\nEnter the no of units consumed:");
```

```
        scanf("%f",&units[i]);
```

```
        if(units[i]<100)
```

```
        {
```

```
            cost[i]=(units[i]*0.3);
```

```
            if(cost[i]>250)
```

```
            {
```

```
                ncost[i]=(cost[i]*.2)+200;
```

```

    }
    else
    {
        ncost[i]=200.00+cost[i];
    }
}
else if(units[i]>100 && units[i]<300)
{
    cost[i]=(100*0.3)+(units[i]-100)*0.50;
    if(cost[i]>250)
    {
        ncost[i]=(cost[i]*.2)+200;
    }
    else
    {
        ncost[i]=200.00+cost[i];
    }
}

}

else if (units[i]>300)
{
    cost[i]=(100*0.30)+(200*0.50)+(units[i]-300)*0.70;
    if(cost[i]>250)
    {
        ncost[i]=(cost[i]*.2)+200;
    }
    else
    {
        ncost[i]=200.00+cost[i];
    }
}

}

}

printf("\nS.No\tUser Name\tUnits Consumed\tBill Amount");
for(int i=0;i<n;i++)
{
    printf("\n%d\t%s\t\t%0.2f\t\t%0.2f",i+1,name[i],units[i],ncost[i]);
}
}
}

```

2) Compute the sum of the following series for the given 'n' value.
 $1 + 1/(2*2) + 1/(3*3) + 1/(4*4) + \dots + 1/(n*n)$

Answer	2 m	2 m	5 m	1 m
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```

#include<stdio.h>
main()
{

```

```

int n;
printf("\nEnter the value of n:");
scanf("%d",&n);
float sum=0;
for(int i=1;i<=n;i++){
    sum=sum+(1/(float)(i*i));
}
printf("\n Sum of the series:%0.2f",sum);
}

```

3) Develop a C code to find the unique words in the given string and print them along with their occurrences. Assume, the case of letters in words are not sensitive.

Sample Input: How are you? Are you feeling better dear?

Output: How:1, are:2, you:2, better:1, feeling:1, dear:1

Answer	2 m	4 m	4 m
--------	-----	-----	-----

```

#include<stdio.h>
#include<string.h>
int main()
{
    int i=0,j=0,n=0,k=0,count,words=0,x;
    char s[20],s2[20],s1[20][20];
    printf("Enter the string:");
    gets(s);
    for(i=0;s[i];i++){
        if(s[i]==' ')
            words++;
    }
    if(i>0)
        words++;
    char array[words][20],a[words][20];
    printf("\nCount:%d",words);
    for(x=0;1;x++){
        if(s[x]!=' '){
            array[n][j++]=s[x];
        }
        else {
            array[n][j++]='\0';//insert NULL
            n++;
            j=0;
        }
        if(s[x]=='\0'){
            n++;
            break;
        }
    }
    for(j=0;j<words;j++){
        count=1;
        strcpy(s2,array[j]);
    }
}

```

```

    for(k=j+1;k<words;k++){
        if(strcmp(s2,array[k])==0){
            count++;
            strcpy(array[k],"chk");
        }
    }
    if(strcmp(array[j],"chk")!=0 ){
        printf("\n%s:%d",array[j],count);
    }
}
}
}

```

4) a) Explain the different storage classes in C. (4 Marks)

- Auto Register Extern Static with Definition

b) Discuss any three string handling functions with proper syntax and examples. (6 Marks)

- Any 3 with Syntax and Examples

5)) Assume that the value of a = 5, b = 6, c = 8, d = 2, and e = 1. Using these values, evaluate and find the result of the following expression and show the evaluation in stepwise.

$a + b \ \&\& \ b / c \ \% \ d \ * \ e \ || \ 5 \leq 0 \ != \ a + b - d$ (3 Marks)

Solution : (Each Colour Code has 1 mark)

$5 + 6 \ \&\& \ 6 / 8 \% 2 * 1 || 5 \leq 0 != 5 + 6 - 2$ (substitute values)

$5 + 6 \ \&\& \ 0 \% 2 * 1 || 5 \leq 0 != 5 + 6 - 2$ (6 / 8 evaluated)

$5 + 6 \ \&\& \ 0 * 1 || 5 \leq 0 != 5 + 6 - 2$ (0 % 2 evaluated)

$5 + 6 \ \&\& \ 0 || 5 \leq 0 != 5 + 6 - 2$ (0 * 1 evaluated)

$11 \ \&\& \ 0 || 5 \leq 0 != 5 + 6 - 2$ (5 + 6 evaluated)

$11 \ \&\& \ 0 || 5 \leq 0 != 11 - 2$ (5 + 6 evaluated)

11 && 0 || 5 <= 0 != 9

(11 – 2 evaluated)

11 && 0 || 0 != 9

(5 <= 0 evaluated)

11 && 0 || 1

(0 != 9 evaluated)

0 || 1

(11 && 0 evaluated)

1

(0 || 1 evaluated)

b) What is an array? How do arrays and pointers relate to each other? Differentiate array of pointers and pointer to array with examples. (7 Marks)

Array (1m)

Array and Pointer Relation (1m)

Differentiate (Min. 5 differences - 5m)