

Ques 1. C program to print table of a given number.

example: input number: 5
output table of 5:

$$5 * 1 = 5$$

$$5 * 2 = 10$$

.....

$$5 * 10 = 50$$

Soln:

```
#include <stdio.h>
int main()
{
    int i, num;
    printf("Enter number to print the table: ");
    scanf("%d", &num);
    for(i=1; i<=10; i++)
    {
        printf("%.d * %.d = %.d \n", num, i, (num*i));
    }
    return 0;
}
```

Output:

Enter number to print the table of : 5

$$5 * 1 = 5$$

$$5 * 2 = 10$$

$$5 * 3 = 15$$

$$5 * 4 = 20$$

$$5 * 5 = 25$$

$$5 * 6 = 30$$

$$5 * 7 = 35$$

$$5 * 8 = 40$$

$$5 * 9 = 45$$

$$5 * 10 = 50$$

Ques. 02

C program to print hollow right triangle star pattern

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

Solⁿ:

```
#include <stdio.h>  
int main()  
{ int i,j,n;  
    printf("Enter number of rows: ");  
    scanf("%d", &n);  
    for(i=1; j<=i; j++)  
    {  
        for(j=1; j<=i; j++)  
        {  
            if (j==1 || j==i || i==n)  
            {  
                printf("*");  
            }  
            else  
            {  
                printf(" ");  
            }  
        }  
        printf("\n");  
    }  
    return 0;
```

Output:

Enter number of rows: 5

*
* *
* * *
* * * *
* * * * *

Ques. 03

C program to find sum of all elements of an array.

Input elements : 10, 20, 30, 40, 50
sum of all elements = 150

Soln:

```
#include <stdio.h>
#define MAX_SIZE 100

int main()
{
    int arr[MAX_SIZE];
    int i, n, sum = 0;

    printf("Enter size of the array: ");
    scanf("%d", &n);

    printf("Enter %d elements in the array: ", n);
    for(i=0; i<n; i++)
    {
        scanf("%d", &arr[i]);
    }

    for(i=0; i<n; i++)
    {
        sum = sum + arr[i];
    }

    printf("Sum of all elements of array = %d", sum)
    return 0;
}
```

Ques. 04

C program to find second largest number
in an array

Soln:

```
#include <stdio.h>
#include <limits.h>
#define MAX_SIZE 1000
int main()
{
    int arr[MAX_SIZE], N, i;
    int max1, max2;
    printf("Enter size of the array (1-1000): ");
    scanf("%d", &N);
    printf("Enter elements in the array: ");
    for(i=0; i<N; i++)
    {
        scanf("%d", &arr[i]);
    }
    max1 = max2 = INT_MIN;
    for(i=0; i<N; i++)
    {
        if(arr[i] > max1)
        {
            max2 = max1;
            max1 = arr[i];
        }
        else if(arr[i] > max2)
        {
            max2 = arr[i];
        }
    }
}
```

```
    printf ("First largest = %.d\n", max1);  
    printf ("Second largest = %.d\n", max2);  
    return 0;  
}
```

Ques. 05

C program to ~~concent~~ concatenate two strings

Example:

input string1 : I love
input string2 : CodeforWin
output string : I love codeforWin

Soln:

```
#include <stdio.h>
#define MAX_SIZE 100
int main()
{
    char text1[MAX_SIZE], text2[MAX_SIZE], output[MAX_SIZE];
    int i, j;
    printf("Enter first string: ");
    gets(text1);
    printf("Enter second string: ");
    gets(text2);

    i = 0;
    while (text1[i] != '\0')
    {
        output[i] = text1[i];
        i++;
    }

    j = 0;
    while (text2[j] != '\0')
    {
        output[i] = text2[j];
        i++;
        j++;
    }
}
```

```
    output[i] = 'O';
    printf("\nFirst string = %s \n", text1);
    printf("Second string = %s \n", text2);
    printf("Final concatenated string = %s \n", output);
    return 0;
}
```

Ques. 06

Access Array Elements Using Pointers

```
#include <stdio.h>
int main()
{
    int data[5], i;
    printf("Enter elements:");
    for(i=0; i<5; ++i)
        scanf("%d", &data[i]);
    printf("you entered: \n");
    for(i=0; i<5; ++i)
        printf("%d\n", *(data+i));
    return 0;
}
```

Ques. 07

c program to find cube of a number using function

example: input any number: 5
output: 125

Solⁿ:

```
#include <stdio.h>
double cube(double num)
{
    return (num*num*num);
}

int main()
{
    int num;
    double c;
    printf("Enter any number: ");
    scanf("%d", &num);
    c=cube(num);
    printf("cube of %d is %.2f\n", num, c);
    return 0;
}
```

Output: Enter any number: 5
cube of 5 is 125.00
6, 28, 496, 8128,

Ques. 13

C program to calculate sum of digits using recursion

input number: 1234

Output sum of digits: 10

Soln:

```
#include <stdio.h>
int sumOfDigits(int num);
int main()
{
    int num, sum;
    printf("Enter any number to find sum of digits:");
    scanf("%d", &num);
    printf("sum of digits of %d = %d\n", num, sum);
    return 0;
}

int sumOfDigits(int num)
{
    if (num == 0)
        return 0;
    return ((num % 10) + sumOfDigits(num / 10));
}
```

Ques. 09 : Write a C program to read name and marks of n numbers of students from user and store them in a file

Soln: #include <stdio.h>

int main()

{

char name[50];

int marks, i, num;

printf("Enter number of students: ");

scanf("%d", &num);

FILE *fptr;

fptr = (fopen("C:\student.text", "w"));

if(fptr == NULL)

{ printf("Error!");

exit(1);

}

for(i=0; i<num; ++i)

{ printf("For student %d Enter name: ", i+1);

scanf("%s", name);

scanf("%d", &marks);

fprint(fptr, "%s %d", name, marks);

}

fclose(fptr);

return 0;

}

Ques. 10 Store Information and Display it using structure

SOM:

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

```
struct student
```

```
{
```

```
    char name [50];
```

```
    int roll;
```

```
    float marks;
```

```
} s;
```

```
int main()
```

```
{
```

```
    printf("Enter info.: \n");
```

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

```
    scanf("%s", s.name);
```

```
    printf("Enter roll number: ");
```

```
    scanf("%d", &s.roll);
```

```
    printf("Enter marks: ");
```

```
    scanf("%f", &s.marks);
```

```
    printf("Displaying info.: \n");
```

```
    printf("Name: ");
```

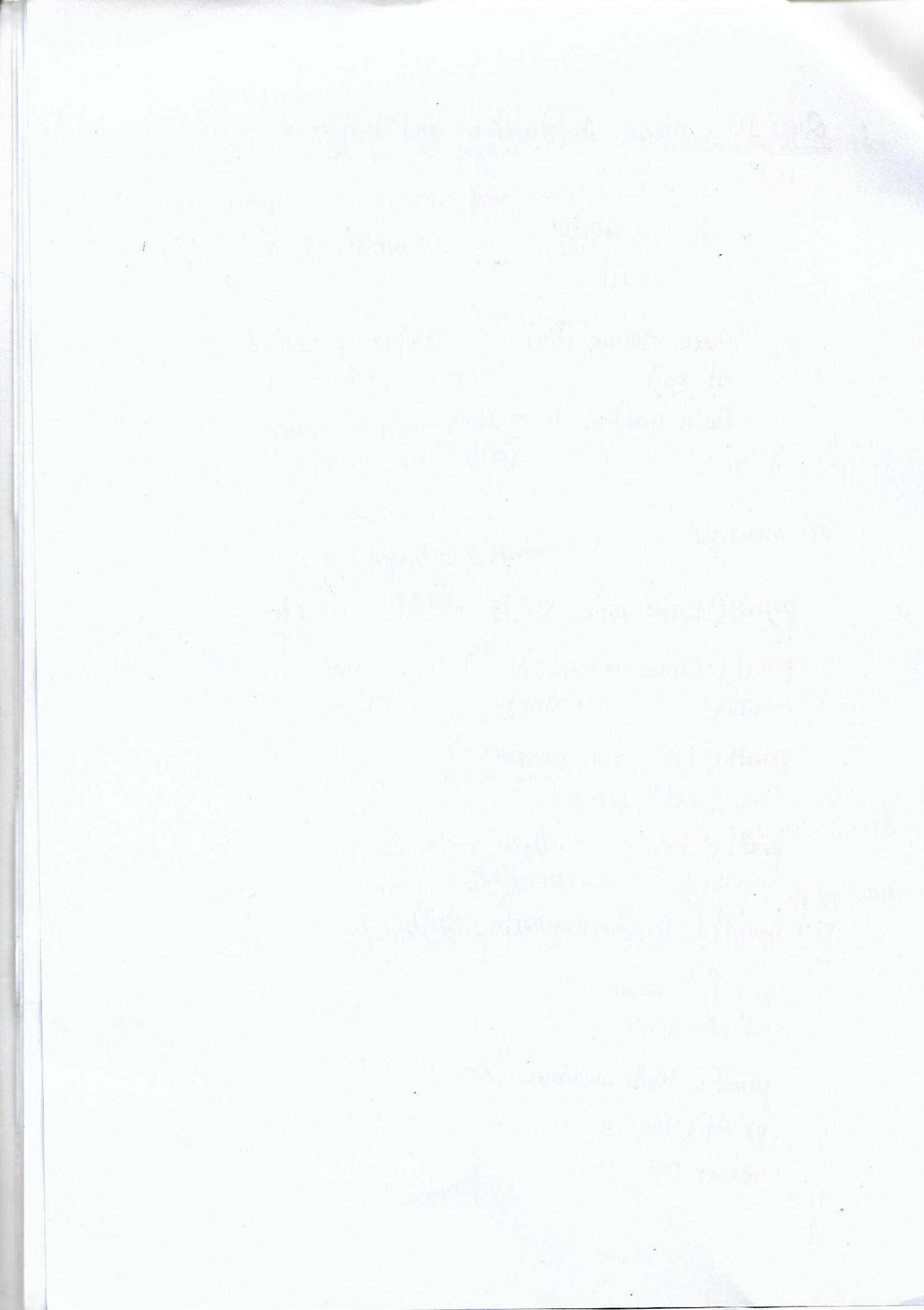
```
    puts(s.name);
```

```
    printf("Roll number: %d \n", s.roll);
```

```
    printf("Marks: %.2f \n", s.marks);
```

```
    return 0;
```

```
}
```



CSE 115
FALL 2015
Solution

Sec : 01

Q1 (A)

Line 5 - error - double x;
~~Corrected - scanf ("%f", &x);~~
Corrected - double x, result;

Line 7 - error - scanf ("%f", x);
Corrected - scanf ("%f", &x);

Line 7 - error - result = circumference(x); - the variable
result used in the main function without being defined
Corrected - double result;
result = circumference(x);

line 11 - error - int circumference (double r)
Corrected - double circumference (double r)

Output of the corrected program for the case when user
enters 1 as radius:

The circumference of the circle is 6.2832

Q 1 (B)

```
#include <stdio.h>
int main()
{
    int num;
    printf("enter final score: ");
    scanf("%d", &num);
    if (num >= 0 && num <= 19)
        printf("CSE is not cool!");
    else if (num >= 20 && num <= 39)
        printf("Your faculty is not cool!");
    else if (num >= 40 && num <= 59)
        printf("Try a bit harder, you are very close!");
    else if (num >= 60 && num <= 100)
        printf("You don't need the help of this program!!!");
}
```

Q2 (A)

```
#include <stdio.h>
#include <string.h>
int main()
{
    char word [25];
    printf("enter a word:");
    scanf("%s", word);
    int i = strlen(word)
    printf("first character : %c, last character : %c", word[0],
           word [i-1]);
}
```

Q2 (B)

```
#include <stdio.h>
int main()
{
    char pass [50];
    printf("enter password:");
    gets(pass);
    int j, i = 0, cb = 0, cc = 0, cl = 0, cusr = 0, clwr = 0;
    while (pass[i] != '\0')
    {
        cc++;
        for (j = 'a'; j <= 'Z'; j++)

```

```
{  
    if (pass[i] == j)  
    {  
        clwr++; break;  
    }  
}  
for (j = 'A'; j <= 'Z'; j++)  
{  
    if (pass[i] == j)  
    {  
        cupr++;  
        break;  
    }  
}  
if (pass[i] == ' '){  
    cb++;  
}  
}  
}  
if (cc >= 8 && cb == 0 && cupr > 0 && clwr > 0)  
    printf("The password is strong");  
else printf("The password is weak");  
}
```

Q3 (A)

I am not sure what will be the output of this program because variable a and b are float type variables, but in the printf statement, instead of using %.f, %.d is being used. I have run this program in codeblocks. The program returns some unusual values.

Q3 (B)

* The program returns the sum of the series

$$1+2+3+4+\dots+n$$

Q4 (A)

double average (int x[])
{

 int sum=0, count=0, i;

 for(i=0; i<20; i++)

 {

 if (x[i]/.3==0)

 continue;

 else

 {

 sum = sum + x[i];

 count++;

 }

}

 sum = sum / count.

```
    return (sum);  
}
```

Q4 (B)

```
#include <stdio.h>  
int main()  
{  
    int i, j, sum = 0, arr[5][5];  
    printf("enter array elements: ");  
    for(i=0; i<5; i++)  
    {  
        for(j=0; j<5; j++)  
        {  
            scanf("%d", &arr[i][j]);  
        }  
    }  
    for(i=0; i<5; i++)  
    {  
        sum = sum + arr[i][i];  
    }  
    j = 0;  
    for(i=5; i>0; i--)  
    {  
        if(i==2)  
            continue;  
        else  
        {  
            sum = sum + arr[i][j];  
            j++;  
        }  
    }  
}
```

```
    printf("sum=%d", sum);  
}
```

Q5 (A)

```
#include <stdio.h>  
int main()  
{  
    int unit, sum=0;  
    printf("enter units consumed:");  
    scanf("%d", &unit);  
    if(unit<=200)  
    {  
        sum=unit*6;  
    }  
    else if (unit <= 400)  
    {  
        sum=200*6+(unit-200)*8;  
    }  
    else if (unit <= 600)  
    {  
        sum=200*6+200*8+(unit-400)*10;  
    }  
    else if (unit > 600)  
    {  
        sum=200*6+200*8+200*10+(unit-600)*12;  
    }  
    printf("amount to be paid: %d", sum);  
}
```

Q5 (B)

```
#include <stdio.h>
int main()
{
    int n1,n2,i;
    printf("enter the interval:");
    scanf("%d %d", &n1, &n2);
    FILE *fp;
    fp=fopen("FinalExam.txt", "w+");
    for(i=n1+1; i<n2; i++)
    {
        if(i%7==0)
            fprintf(fp, "%d", i);
        else continue;
    }
    fclose(fp);
}
```

Section 02, Question 6

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

```
void DecideChampion();
```

```
struct team
```

```
{
```

```
    char team [50];
    char name1[50];
    char name2 [50];
    char name3 [50];
    char ins [50]
    int prob;
```

```
} t[200];
```

```
int main()
```

```
{
```

```
    int i;
```

```
    for(i=0;i<200;i++)
```

```
{
```

```
        fflush(stdin);
```

```
        printf("enter team name:");
```

```
        gets(t[i].team);
```

```
        printf("enter name of member1:");
```

```
        fflush(stdin);
```

```
        gets(t[i].name1);
```

```
        printf("enter name of member2:");
```

```

fflush(stdin);
gets(t[i].name2);
printf("enter name of member 3:");
fflush(stdin);
gets(t[i].name3);
printf("enter name of institution:");
fflush(stdin);
gets(t[i].ins);
printf("enter the number of problems solved:");
scanf("%d", &t[i].prob);

}

FILE *fp;
fp=fopen("champion.txt","wt");
for(i=0;i<200;i++)
{
fwrite(&t[i],sizeof(t[i]),1,fp);
}
fclose(fp);

DecideChampion();
return 0;

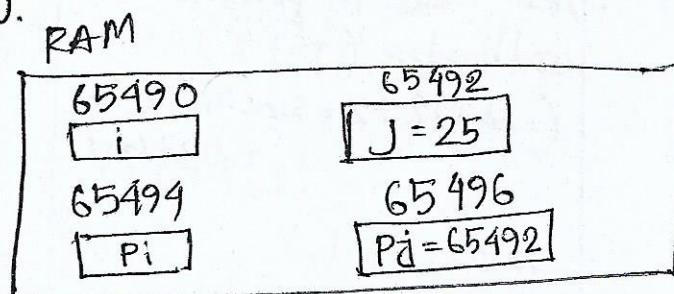
}

void DecideChampion()
{
int count,cl=0,i;
for(i=0;i<200;i++)
{
if(t[i].prob>cl)
{
cl=t[i].prob;
printf("winner team: %s",t[count].team);
}
}
}

```

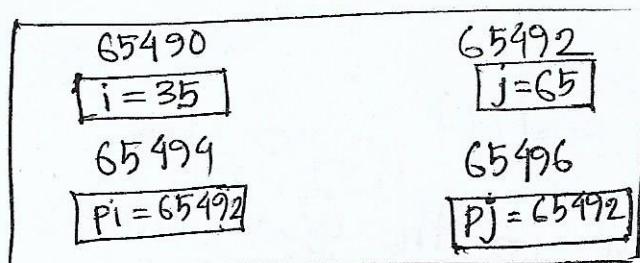
Ans. to the Ques. No. 01

(a) SoM: When the program is executed, the int variables i and j are declared. The pointers pi and pj of the type int are also declared. The pointer pj is initialized with the address of j. Assume that the variables and pointers are stored in memory as shown below.



After the execution of the pointer expressions in the program, the values are updated as follows.

RAM



the values for the expressions are given in the following table.

Sl No.	Expression	Meaning	Result
1	&i	address of i	65490
2	&j	address of j	65492
3	pj	value stored in pj (which is pointer address)	65492
4	*pj	value referred by pj	65

S/No.	Expression	Meaning	Result
5	*pi	value referred by pi	65
6	*pi + 2	value referred by pi + 2	67
7	*(pi - 1)	value referred by (pi - 1) $(= 65492 - 1 * \text{size of (int)} = 65490)$	35
8	(pi + 2)	new value in pointer arithmetic (pi + 2) $(= 65492 + 2 * \text{size of (int)} = 65496)$	65496
9	i	value of i	35
10	pi	value stored in pi (which is also a pointer address)	65492

(b) double *list = (double *) malloc (sizeof(double) * 100);

(c) 10

Ans. to the Ques. NO. 02

```
#include <stdio.h>
int main()
{
    char input[50];
    int i;
    printf("Please enter a sentence:");
    gets(input, 50, stdin);
```

```
for (i=0; input[i] != '\0'; i++)
{
    if (input[i] == '?' || input[i] == '!' || input[i] == '#'
        || input[i] == '%' || input[i] == '*')

    {
        for (i=0; input[i] != '\0'; i++)
        {
            if (input[i] == '?')
            {
                input[i] = 'a';
            }
            else if (input[i] == '!')
            {
                input[i] = 'e';
            }
            else if (input[i] == '#')
            {
                input[i] = 'i';
            }
            else if (input[i] == '%')
            {
                input[i] = 'o';
            }
            else if (input[i] == '*')
            {
                input[i] = 'u';
            }
        }
    }
}
```

```
333 printf("Your new sentence is: %s", input); return 0; }
```

Ans. to the Ques. No. 04

```
#include <stdio.h>
void main(){
    FILE *fp1, *fp2;
    char ch;
    fp1 = fopen("input.txt", "r");
    fp2 = fopen("output.txt", "w");
    while(1){
        ch = fgetc(fp1);
        if(ch == EOF)
            break;
        else
            putc(ch, fp2);
    }
    printf("File copied successfully!");
    fclose(fp1);
    fclose(fp2);
}
```

Ans. to the Ques. No. 03

```
#include <stdio.h>
int main()
{
    int i, j, m, n;
    int A[m][n];
    int sum = 0;

    printf("Enter the no. of rows :"); //inputting the
    scanf("%d", &m);                number of rows

    printf("Enter the no. of columns :"); //inputting the
    scanf("%d", &n);                number of columns

    /*inputting the array*/
    for (i=0; i<m; i++)
    {
        for (j=0; j<n; j++)
        {
            printf("Enter the elements :");
            scanf("%d", &A[i][j]);
        }
    }

    for (i=0; i<m; i++)
    {
        for (j=0; j<n; j++)
        {
            if ((i==0 || j==0 || i==m-1 || j==n-1) || (i+j==m-1))
                sum = sum + A[i][j];
        }
    }

    printf("Sum = %d", sum);
}
```

```
    }  
}  
printf("The sum : %.d", sum);  
}
```

Ans. to the Ques. No. 05

```
#include <stdio.h>  
int f(int n)  
{  
    if(n==0)  
        return 1;  
    else  
        return n*f(n-1)+n;  
}  
  
int main()  
{  
    printf("%d", f(4));  
    return 0;  
}
```

Ans. to the Ques. 06

```
#include <stdio.h>
struct book{
    char bookName [100];
    char authorName [100];
    char publicationName [100];
    int copiesSold;
};

struct book bookFair [100];
void BestSeller();
int main()
{
    int i;
    for(i=0; i<100; i++)
    {
        printf("Enter Name Of Book:");
        scanf("%s", &bookFair[i].bookName);
        printf("Enter Name Of Author:");
        scanf("%s", &bookFair[i].authorName);
        printf("Enter Name Of Publication:");
        scanf("%s", &bookFair[i].publicationName);
        printf("Enter Number of copies Sold:");
        scanf("%d", &bookFair[i].copiesSold);
    }
}
```

```
    BestSeller(bookFair[i].copiesSold);  
}  
void BestSeller()  
{  
    int max=0, i;  
    for (int i=0; i<100; i++)  
    {  
        if (bookFair[max].copiesSold < bookFair[i].copiesSold)  
        {  
            max=i;  
        }  
    }  
    printf("Name of Book: %s", bookFair[max].bookName);  
    printf("Name of Author: %s", bookFair[max].authorName);  
    printf("Name of Publication: %s", bookFair[max].publicationName);  
}
```

Ans. to the Ques. No. 07

```
#include <stdio.h>
int main()
{
    int N; int v; int i;
    int array1[N];
    int array2[N];
    printf("Enter value of N");
    scanf("%d", &N);
    for(int i = 0; i < N; ++i)
    {
        printf("Enter NO %d : ", i+1);
        scanf("%d", &array1[i]);
    }
    for(int i = 0; i < N; ++i)
    {
        array2[i] = array1[i];
    }
    printf("Enter the new number you want to place in
           the array:");
    scanf("%d", &v);
    printf("Enter a place from 0-%d to insert the array:", N-1);
    scanf("%d", &i);
    for(int i = 0; i < N; ++i)
    {
        if(v == i)
```

```
array[i] = v;
for (; i < N; ++i)
{
    array1[i+1] = array2[i];
}
for (int i=0; i < 10; ++i)
{
    printf("%d", array1[i]);
}
return 0;
}
```

Final Spring - 16
Solution

Ans. to the Ques. No. 01

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

struct emp
{
    int digit;
    int age;
    double Salary;
};

int e[1000];
double hsalary(struct emp e[], int N);

int main(void)
{
    int N, i;
    printf("Enter employees' number:");
    scanf("%d", &N);
    for(i=1; i<=N; i++)
    {
        printf("Employee No.%d:\n", i);
        printf("4-digit employee number:");
        scanf("%d", &e[i].digit);
        printf("Age:");
        scanf("%d", &e[i].age);
        printf("Salary:");
        scanf("%lf", &e[i].Salary);
        printf("\n\n");
    }
}
```

```
hsalary (e, N);
return (0);
}

double hsalary (struct emp e[], int N)
{
    double max = 0;
    int i;
    for (i = 1; i <= N; i++)
    {
        if (max < e[i].salary)
        {
            max = e[i].salary
        }
    }
    printf ("\\nHighest salary amount: %.lf", max);
}
```

Ans. to the Ques. No. 02

(a) start start start

(b)

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <math.h>

int main(void)
{
    int j, sum = 0;
    j = 0;
    while (j < 10) {
        sum = sum + j;
        j++;
    }
    printf ("Sum : %d\n", sum);
    return (0);
}
```

```
(c) #include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <math.h>

int main(void)
{
    int i=1;
    int count=1;
    double sum=1, term=1, fact=1;

    while(1)
    {
        fact=fact*i;
        term=1/fact;
        if(term<0.001)
        {
            break;
        }

        sum=sum+term;
        i++;
        count++;
    }

    printf("\nNumber of terms: %.d\n", count);
    printf("\nApproximation of e: %.1f\n", sum);
    return(0);
}
```

Q

Ans. to the Ques. No. 03

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <math.h>

int main(void)
{
    int A[6][6], i, j, sum = 0;
    for (i = 0; i < 6; i++)
    {
        for (j = 0; j < 6; j++)
        {
            printf("A[%d][%d] : ", i, j);
            scanf("%d", &A[i][j]);
        }
    }

    FILE *p;
    p = fopen("data.txt", "w");
    for (i = 0; i < 6; i++)
    {
        j = i;
        fprintf(p, "%d", A[i][j]);
        sum = sum + A[i][j];
    }

    printf("\nSum : %d\n", sum);
    fclose(p); return(0);
}
```

Ans. to the Ques. No. 04

a. heheorshe

b.

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <math.h>

int main(void)
{
    char str[100];
    int i;
    int count = 0;
    getchar();
    printf("Enter a string: ");
    gets(str);

    for(i = 0; str[i] != '\0'; i++)
    {
        if(str[i] == 'a' || str[i] == 'e' || str[i] == 'i' || str[i] == 'o'
           || str[i] == 'u' || str[i] == 'y' || str[i] == 'm'
           || str[i] == 'n' || str[i] == 'l')
            continue;
    }
    else
    {
        count++;
    }
    printf("\nLength: %d\n", count);
    return(0);
}
```

Ans. to the Ques. No. 05

b. It will print natural number.

c.

```
int hanoi(int)
```

```
{
```

```
    if (n==1)
```

```
        return 1;
```

```
    else
```

```
        return 2*hanoi(n-1)+1;
```

```
}
```

Ans. to the Ques. No. 06

b. #include <stdio.h>

```
int main(void)
```

```
{
```

```
    int a=10;
```

```
    int *p;
```

```
    p=&a;
```

```
    printf("Address: %d", p);
```

```
    printf("Value at p: %d\n", *p);
```

```
    return (0);
```

```
}
```

c.

	a	b	a-P	b-P
1 →	50	0	-	-
2 →	50	0	a	b
3 →	50	50	a	b
4 →	50	50	b	b
5 →	2500	50	b	b
6 →	2500	50	b	b
7 →	2500	0	b	b