5. A) Develop a Program in C for the following Stack Applications
a. Evaluation of Suffix expression with single digit operands and operators:
+, -, *, /, %, ^

```
#include<stdio.h>

#include<stdlib.h>

#include <math.h>

#include<ctype.h>
int i, top = -1;
int op1, op2, res, s[20];
char postfix[90], symb;

void push(int item)
{
top = top + 1;
s[top] = item;
}
int power(int a,int b){
int t = a;
for(i=1;i<=b;i++){
a = a*t;
i++;
}}
int pop()
{
int item;
item = s[top];
top = top - 1;
return item;
}

void main()
{
printf("\nEnter a valid postfix expression:\n");
scanf("%s", postfix);
for (i = 0; postfix[i] != '\0'; i++)
{
symb = postfix[i];
if (isdigit(symb))
{
push(symb - '0');
}
else
{
op2 = pop();
op1 = pop();
switch (symb)
```

```
{
case '+':
push(op1 + op2);
break;
case '-':
push(op1 - op2);
break;
case '*':
push(op1 * op2);
break;
case '/':
push(op1 / op2);
break;
case '%':
push(op1 % op2);
break;
case '^':
push(power(op1,op2));
break;
default:
push(0);
}
}
}
res = pop();
printf("\n Result = %d", res);
}
```

OUTPUT

Enter a valid postfix expression:
78+65+*
Result = 165

5.B) Solving Tower of Hanoi problem with n disks.

```
#include <stdio.h>

void tower(int n, int source, int temp, int destination)
{
   if (n == 0)
      return;
   tower(n - 1, source, destination, temp);
   printf("\nMove disc %d from %c to %c", n, source, destination);
   tower(n - 1, temp, source, destination);
}
void main()
{
   int n;
   printf("\nEnter the number of discs: \n");
   scanf("%d", & n);
   tower(n, 'A', 'B', 'C');
   printf("\n\nTotal Number of moves are: %d", (int) pow(2, n) - 1);
}
```

OUTPUT

```
Enter the number of discs: 3

Move disc 1 from A to C
Move disc 2 from A to B
Move disc 1 from C to B
Move disc 3 from A to C
Move disc 1 from B to A
Move disc 2 from B to C
Move disc 1 from A to C

Total Number of moves are: 7
```