

ASSIGNMENT-1

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Branch-ELECTRICAL

SUBJECT-APPLICATION FOR EE PROGRAMMING

SUBJECT CODE-EET273

AIM-SOLVING ELECTRICAL PROBLEM USING C PROGRAM

METHOD-FUNCTION POINTER

DESCRIPTION-WITH THIS PROGRAM THE CONDITION OF ELECTRICAL BRIDGES CAN BE CHECKED AND VALUE OF QUALITY FACTOR IS CALCULATED WHICH INCLUDES MAXWELL BRIDGE, MAXWELL – INDUCTANCE BRIDGE, HAYS BRIDGE, OWEN BRIDGE.

PROGRAM	EXPLANATION
	1).IN THIS FIRST I CREATED THE FUNCTION FOR EACH REQUIRED BRIDGE IN WHICH THE VARIABLE REQUIRED ARE DECLARED AND THE CONDITION AND QUALITY FACTOR FOR EACH BRIDGE IS WRITTEN
	2).THEN ALL THE VARIABLES IS PASSED IN FUNCTION POINTER.IN FUNCTION POINTER FUNCTION'S NAME CAN BE USED TO GET FUNCTION ADDRESS .ALSO IT CAN PASS THE FUNCTION AS AN ARGUMENT AND CAN BE RETURNED FROM A FUNCTION.THUS WITH THE HELP OF THIS THE BRIDGE FUNCTIONS ARE PASSED AS ARGUMENT ALSO.
	3).HERE WITH THE HELP OF CODE AND OUTPUT SNAP I WILL PRESENT THE OUTPUT FOR BALANCED AS WELL AS UNBALANCED.

CODE-

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

```
void maxwell(int r2,int r3,int r4,int l3,int w)
{ int r1,l1,c,d,qf;
  printf("Enter value for R1 AND L1=\n");
  scanf("%d%d",&r1,&l1);
  c=(r2*r3)/r4;
  d=(r2*l3)/r4;
  if(c==r1&&d==l1)
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    {
        printf("\nBridge is balanced\n");
        qf=(w*l3)/r3;
        printf("Quality factor= %d\n",qf);
    }
    else
    {
        printf("\nBridge is not balanced\n");
    }
}
void maxwellinduc(int r2, int r3,int r4,int c4,int w)
{
    int r1,l1,c,d,qf;
    printf("Enter value for R1 AND L1=\n");
    scanf("%d%d",&r1,&l1);
    c=(r2*r3)/r4;
    d=c4*r2*r3;
    if(c==r1&&d==l1)
    {
        printf("\nBridge is balanced\n");
        qf=w*c4*r4;
        printf("Quality factor= %d\n",qf);
    }
    else
    {
        printf("\nBridge is not balanced\n");
    }
}
void hays(int r2,int r3,int r4,int c4,int w)
{
    int r1,l1,c,d,qf;
    printf("Enter value for R1 AND L1=\n");
    scanf("%d%d",&r1,&l1);
    c=(r2*r3*r4*(c4*c4)*(w*w))/(1+(w*w)*(c4*c4)*(r4*r4));
    d=(r2*r3*c4)/(1+(w*w)*(c4*c4)*(r4*r4));
    if(c==r1||d==l1)
    {
        printf("\nBridge is balanced\n");
        qf=1/(w*c4*r4);
        printf("Quality factor= %d\n",qf);
    }
    else
    {
        printf("\nBridge is not balanced\n");
    }
}
void owen(int r2, int r3,int c4,int c2,int w)
{
    int r1,l1,c,d,qf;
    printf("Enter value for R1 AND L1=");

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scanf("%d%d",&r1,&l1);
c=(r2*c4)/c2;
d=r2*r3*c4;
if(c==r1&&d==l1)
{
    printf("\nBridge is balanced\n");
    qf=w*r2*c2;
    printf("Quality factor= %d\n",qf);
}
else
{
    printf("\nBridge is not balanced\n");
}
}

int main()
{
    // fun_ptr_arr is an array of function pointers
    void (*fun_ptr_arr[])(int,int,int,int,int) = {maxwell,maxwellinduc,hays,owen};
    unsigned int ch;
    int r1,r2,r3,r4,l1,l2,l3,c1,c2,c3,c4,w;

    printf("Enter Choice: \n0 FOR MAXWELL BRIDGE\n1 FOR MAXWELL
INDUCTANCE BRIDGE\n 2 FOR HAYS BRIDGE"
        "\n 3 FOR OWEN BRIDGE\n");
    scanf("%d", &ch);
    if(ch==0)
    {
        printf("\nEnter value for R2,R3,R4,L3,w=\n");
        scanf("%d%d%d%d%d",&r2,&r3,&r4,&l3,&w);
        (*fun_ptr_arr[ch])(r2,r3,r4,l3,w);
    }

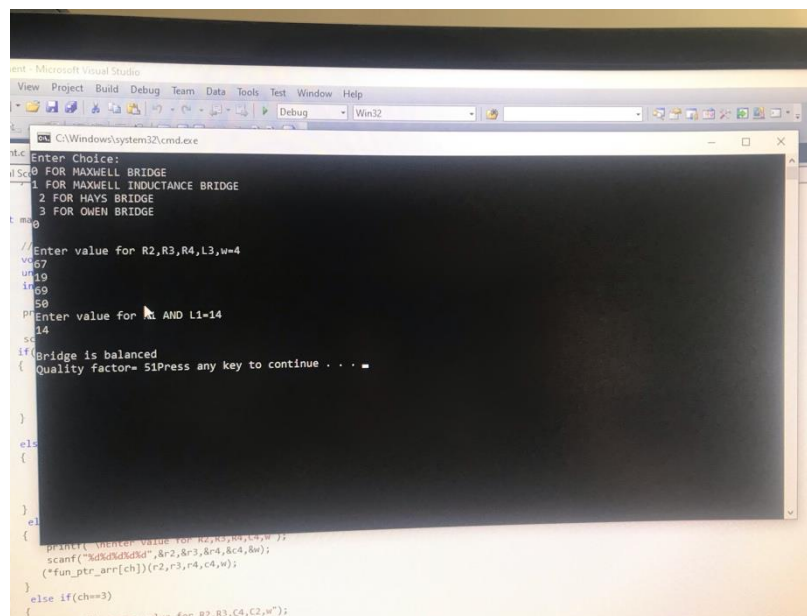
    else if(ch==1)
    {
        printf("\nEnter value for R2,R3,R4,C4,w=\n");
        scanf("%d%d%d%d%d",&r2,&r3,&r4,&c4,&w);
        (*fun_ptr_arr[ch])(r2,r3,r4,c4,w);
    }
    else if(ch==2)
    {
        printf("\nEnter value for R2,R3,R4,C4,w=\n");
        scanf("%d%d%d%d%d",&r2,&r3,&r4,&c4,&w);
        (*fun_ptr_arr[ch])(r2,r3,r4,c4,w);
    }
    else if(ch==3)
    {
        printf("\nEnter value for R2,R3,C4,C2,w=\n");
        scanf("%d%d%d%d%d",&r2,&r3,&c4,&c2,&w);
        (*fun_ptr_arr[ch])(r2,r3,c4,c2,w);
    }
}

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}  
else  
return 0;  
}
```

OUTPUT-

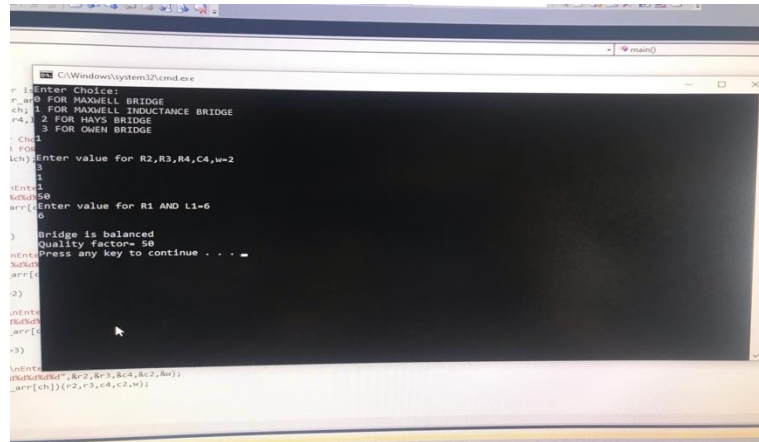
1).MAXWELL BRIDGE (BALANCED)-



```
Microsoft Visual Studio  
View Project Build Debug Team Data Tools Test Window Help  
Debug Win32  
CAWindow\system32\cmd.exe  
Enter Choice:  
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2 FOR MAXWELL INDUCTANCE BRIDGE  
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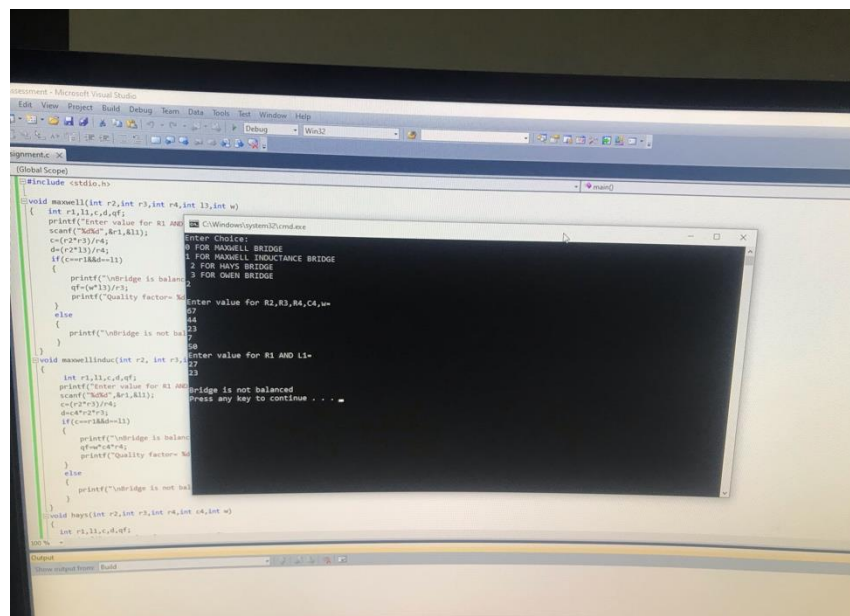
```

2).MAXWELL INDUCTANCE BRIDGE (BALANCED)-



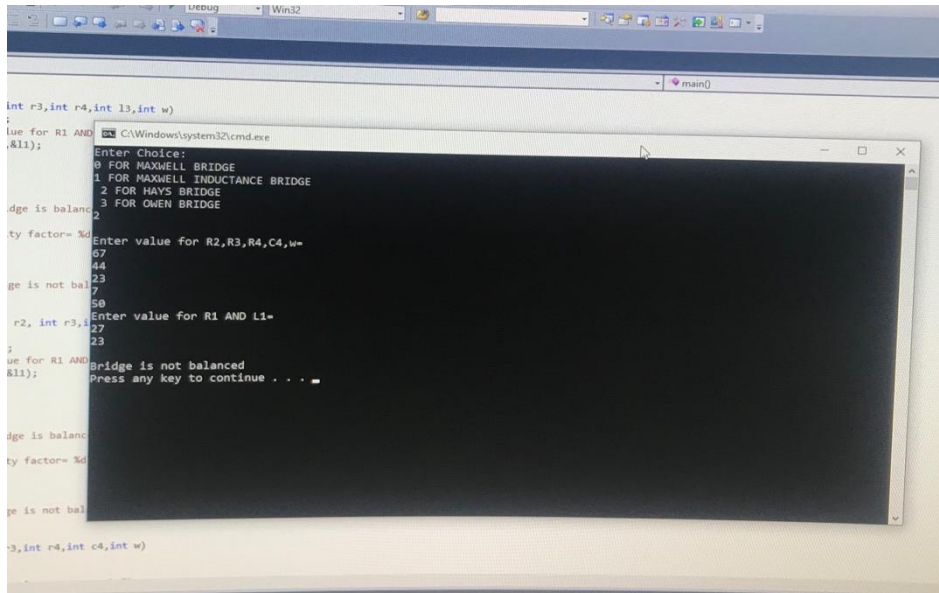
```
Enter Choice:
0 FOR MAXWELL BRIDGE
1 FOR MAXWELL INDUCTANCE BRIDGE
2 FOR HAYS BRIDGE
3 FOR OWEN BRIDGE
Enter value for R2,R3,R4,C4,w=
3
1
1
1
1
Enter value for R1 AND L1=
6
0
Bridge is balanced
Quality factor= 50
Press any key to continue . . .
```

3).HAYS BRIDGE (UNBALANCED CONDITION)



```
Enter Choice:
0 FOR MAXWELL BRIDGE
1 FOR MAXWELL INDUCTANCE BRIDGE
2 FOR HAYS BRIDGE
3 FOR OWEN BRIDGE
Enter value for R2,R3,R4,C4,w=
3
1
1
1
1
Enter value for R1 AND L1=
6
0
Bridge is not balanced
Quality factor= 50
Press any key to continue . . .
```

4).OWEN BRIDGE (BALANCED)



The image shows a screenshot of a C program running in a debugger (Win32). The program is a menu-driven application for calculating bridge parameters. The visible code includes variables for resistors (r1, r2, r3, r4), inductance (L1), capacitance (C4), and quality factor (Q). The program prompts the user to enter a choice (0 for Maxwell Bridge, 1 for Maxwell Inductance Bridge, 2 for Hay's Bridge, 3 for Owen Bridge) and then asks for values for R2, R3, R4, C4, and w. The user has entered 3 for Owen Bridge. The program then prompts for R1 and L1. The user has entered 27 for R1 and 23 for L1. The program then displays the message "Bridge is not balanced" and "Press any key to continue . . .".

```
int r3,int r4,int l3,int w)
;
ue for R1 AND
,&l1);

dge is balanc
2

ty factor= %d
67
44
23
7
ge is not bal
30
Enter value for R2,R3,R4,C4,w=
44
23
7
30
Enter value for R1 AND L1=
27
23
;
ue for R1 AND
&l1);

dge is balanc
ty factor= %d
ge is not bal

-3,int r4,int c4,int w)
```

HENCE HERE ALL THE CONDITION AND QUALITY FACTOR IS CHECKED AND CALCULATED RESPECTIVELY BY USING THIS C PROGRAM