**ELEMENTS OF POWER SYSTEMS**

**EXPERIMENT 3**

**Codes:**

**1)**

clc

clear all

syms I1 I2 V R

P1=V\*I1; %power supplied by 2-wire dc system

W1=2\*I1^2\*R; %power loss in 2- wire dc system

W1\_per=W1/P1\*100; %percentage power loss in 2- wire dc system

P2=sqrt(3)\*V\*I2; %power supplied by 3 phase 3 wire ac system

W2=3\*I2^2\*R; %power loss in 3 phase 3- wire ac system

W2\_per=W2/P2\*100; %percentage power loss in 3 phase 3- wire ac system

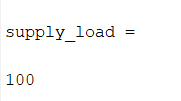
eq1= W1\_per==W2\_per;

I22=solve(eq1,I2);

P22=sqrt(3)\*V\*I22;

supply\_load=((P22-P1)/P1)\*100

**Output:**



**2)**

clc

clear all

syms I1 I2 V R

P1=2\*V\*I1; %power supplied by 3 wire dc system

W1=2\*I1^2\*R; %power loss in 3- wire dc system

W1\_per=W1/P1\*100; %percentage power loss in 2- wire dc system

P2=3\*V\*I2; %power supplied by 3 phase 4 wire ac system

W2=3\*I2^2\*R; %power loss in 3 phase 4- wire ac system

W2\_per=W2/P2\*100; %percentage power loss in 3 phase 4- wire ac system

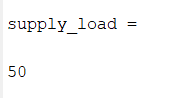
eq1= W1\_per==W2\_per;

I22=solve(eq1,I2);

P22=3\*V\*I22;

supply\_load=((P22-P1)/P1)\*100

**Output:**

****

**3)**

clc

clear all

syms I1 I2 V R

P1=V\*I1;%power supplied by 1 phase ac system

W1=2\*I1^2\*R; %power loss in 1 phase ac system

W1\_per=W1/P1\*100; %percentage power loss in 1 phase ac system

P2=sqrt(3)\*V\*I2; %power supplied by 3 phase 3 wire ac system

W2=3\*I2^2\*R; %power loss in 3 phase 3- wire ac system

W2\_per=W2/P2\*100; %percentage power loss in 3 phase 3- wire ac system

eq1= W1\_per==W2\_per;

I22=solve(eq1,I2);

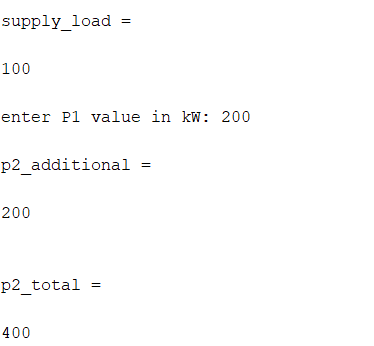
P22=sqrt(3)\*V\*I22;

supply\_load=((P22-P1)/P1)\*100

p1=input("enter P1 value in kW: ");

p2\_additional=((supply\_load)/100 +1)\*p1

**Output:**



**COMBINED CODE:**

clc

clear all

%combined code for all three problems

a=input('enter\n 1 FOR CASE 1\n 2 FOR CASE 2\n 3 FOR CASE 3\n');

syms I1 I2 V R

if a==1

P1=V\*I1; %power supplied by 2 wire dc system

W1=2\*I1^2\*R; %power loss in 2- wire dc system

W1\_per=W1/P1\*100; %percentage power loss in 2- wire dc system

P2=sqrt(3)\*V\*I2; %power supplied by 3 phase 3 wire ac system

W2=3\*I2^2\*R; %power loss in 3 phase 3- wire ac system

W2\_per=W2/P2\*100; %percentage power loss in 3 phase 3- wire ac system

eq1= W1\_per==W2\_per;

I22=solve(eq1,I2);

P22=sqrt(3)\*V\*I22;

supply\_load=((P22-P1)/P1)\*100

elseif a==2

P1=2\*V\*I1; %power supplied by 3 wire dc system

W1=2\*I1^2\*R; %power loss in 3- wire dc system

W1\_per=W1/P1\*100; %percentage power loss in 2- wire dc system

P2=3\*V\*I2; %power supplied by 3 phase 4 wire ac system

W2=3\*I2^2\*R; %power loss in 3 phase 4- wire ac system

W2\_per=W2/P2\*100; %percentage power loss in 3 phase 4- wire ac system

eq1= W1\_per==W2\_per;

I22=solve(eq1,I2);

P22=3\*V\*I22;

supply\_load=((P22-P1)/P1)\*100

elseif a==3

syms I1 I2 V R

P1=V\*I1;%power supplied by 1 phase ac system

W1=2\*I1^2\*R; %power loss in 1 phase ac system

W1\_per=W1/P1\*100; %percentage power loss in 1 phase ac system

P2=sqrt(3)\*V\*I2; %power supplied by 3 phase 3 wire ac system

W2=3\*I2^2\*R; %power loss in 3 phase 3- wire ac system

W2\_per=W2/P2\*100; %percentage power loss in 3 phase 3- wire ac system

eq1= W1\_per==W2\_per;

I22=solve(eq1,I2);

P22=sqrt(3)\*V\*I22;

supply\_load=((P22-P1)/P1)\*100

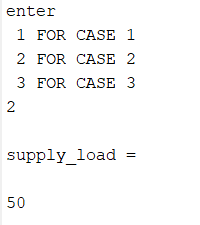
p1=input("enter P1 value in kW: ");

p2\_additional=((supply\_load)/100)\*p1

p2\_total=((supply\_load)/100 +1)\*p1

end

**Output:**

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