24-8-2020

Sebin Wilson E

Roll No. 26

Performance-Evaluation Experiment-1

Computation of Inductance of Single Phase and Three phase Transmission Line

Problem-1

2. Determine the inductance of a 3-phase symmetrical line whose conductors are placed at the corners of an equilateral triangle of sides 1 metre. The diameter of each conductor is 20 mm. [Ans 0·971 mH/phase/km]

Sample Program

```
clc;
clear;
format('v',20)
d=input("Enter the diameter of the conductors in cm: ")
dab=input("Enter the spacing of A and B in ms: ")
dbc=input("Enter the spacing of B and C in ms: ")
dca=input("Enter the spacing of C and A in ms: ")
r=(d/2)*10^-2
D=(dab*dbc*dca)^(1/3)
L=(0.5+2*log(D/r))*10^-7
Lkm=L*1000
disp("Inductance per phase per km of given transmission line
is:",Lkm)
```

Sample Output

```
Enter the diameter of the conductors in cm: 2

Enter the spacing of A and B in ms: 1

Enter the spacing of B and C in ms: 1

Enter the spacing of C and A in ms: 1

"Inductance per phase per km of given transmission line is:"
0.00097103403719762
```

Problem-2

5. The three conductors of 3-phase overhead line are arranged in a horizontal plane with a spacing of 4 m between adjacent conductors. The diameter of each conductor is 2 cm. Determine the inductance per km per phase of the line assuming that the lines are transposed. [Ans 1·3 mH]

Sample Program

```
clc;
clear;
format('v',20)
d=input("Enter the diameter of the conductors in cm: ")
GMR=0.7788*(d/2)*10^-2
//Here equi distant. Hence taking only 1 distance(between
adjacent pair)
dab=input("Enter the spacing of A and B in ms: ")
//ab*(ab)*(ab*2)
Dm=((dab^3)*2)^(1/3)
L=(2*log(Dm/GMR))*(10^-7)
Lkm=L*1000
disp("Inductance per phase per km of given transmission line
is:",Lkm)
```

Sample Output

```
Enter the diameter of the conductors in cm: 2

Enter the spacing of A and B in ms: 4

"Inductance per phase per km of given transmission line is:"
0.00129450292255574
```