School of Engineering
B.TECH Electrical Engineering
Mid Term Examination - May 2024

Duration : 90 Minutes
Max Marks : 50

## Sem IV - G2UB406T - Fundamentals of Power Systems

General Instructions
Answer to the specific question asked
Draw neat, labelled diagrams wherever necessary
Approved data hand books are allowed subject to verification by the Invigilator

1) Classify different factors for the choice of transmission voltage. K2 (2)

2) Define efficiency and regulation of a transmission line. K1 (3)

3) Explain the factors for the of transmission voltage selection : a) Power loss in line line per phase and b) voltage drop in line per phase. K2 (4)

4) Summarize the advantages and disadvantages of high voltage transmission. K2 (6)

5) Identify the volume of conductor used in DC two wire system with mid point earthed and compare with the DC two wire system with one wire earthed for overhead lines. K3 (6)

6) Define inductance a conductor . Determine the inductance to construct a 1-φ transmission line consisting of three conductors of 2.5 mm radii in the 'go' conductor and two conductors of 5 mm radii in the, return, conductor. The configuration of the line is as shown in Figure. K3 (9)
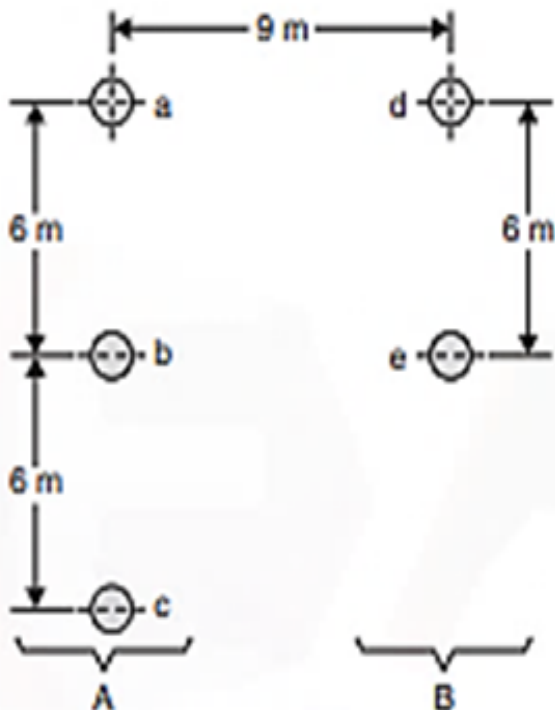
K4 (8)

7) Classify different types of conductors.

8) Analyze the capacitance of three phase double circuit transmission line for hexagonal spacing.

K4 (12)

OR

Analyze the Kelvin's law to find the most economical size of the conductor. The cost of a 3-phase overhead transmission line is Rs (25000 a + 2500) per km where 'a' is the area of X-section of each conductor in cm2 . The line is supplying a load of 5 MW at 33 kV and 0·8 p.f. lagging assumed to be constant throughout the year. Energy costs 4P per kWh and interest and depreciation total 10% per annum. Given that specific resistance of conductor material is 10^{-6} Ω cm.

K4 (12)