B.E. Sixth Semester (Electro. & Power, Elect. & Power, Electrical Engg.) (CGS)

10561 : Electrical Power - I : 6 EP 01 / 6 EL 01 / 6 EE 01

P. Pages : 2 | AU - 2754

Time : Three Hours | Max. Marks : 80

* 0 7 3 8 *

Notes : 1. Answer **three** question from Section A and **three** question from Section B.
2. Due credit will be given to neatness and adequate dimensions.
3. Assume suitable data wherever necessary.
4. Illustrate your answer necessary with the help of neat sketches.
5. Use of pen Blue/Black ink/refill only for writing the answer book.

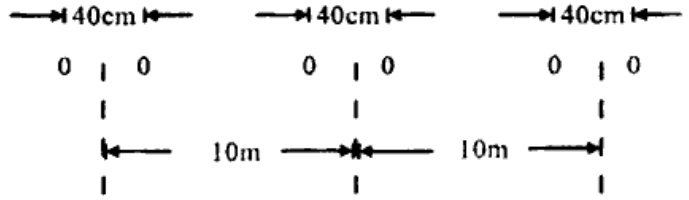
SECTION – A

1. a) Explain the method of transposition and its importance in transmission lines. **7**

b) Explain the basics of calculations of resistance, inductance and capacitance of a transmission line. **7**

OR

2. a) Find the inductance / phase / km length of the system of conductor as show in fig. The GMR of each conductor is 0.90cm. Assume transposition. **8**



b) Explain the proximity effect. **6**

3. a) Explain Corona formation in transmission system. State its advantages and disadvantages. **6**

b) Determine efficiency and regulation of a 3 phase 150 km long, 50Hz transmission line delivering 20MW at 0.8 p.f. lagging and 66kV to a balanced load. Resistance of line is 0.075Ω/km, outside diameter is 1.5cm. spaced equilaterally 2m between centres. Use nominal π method. **7**

OR

4. a) Explain Ferranti effect with the help of phaser diagram and obtain the expression for voltage rise of unloaded line. **6**

b) A 200km, 3ph, 50Hz transmission line has following data **7**
$A = D = 0.98 \angle 1.2°$, $B = 131.2 \angle 72.3°$ Ω/phase $C = 0.0015 \angle 90°$. The sending end voltage is 225kV. Determine
i) The line charging current.
ii) The maximum power that can be transmitted at a receiving end voltage of 220kV.

5. a) Explain "OFF load" and "ON load" tap changing transformer. **6**

b) Draw and explain the construction of receiving end circle diagram. **7**

OR

6. a) Explain in brief: 6
   i) Static VAR generator. ii) Automatic voltage control.

   b) A 3 phase line has A = 0.9 ∠2°, B = 140 ∠70° which delivers 60 MVA at 132kV at 0.8 p.f. lagging. Draw. 7
   i) Sending end voltage and power angle
   ii) Maximum power which line can deliver with above values of sending end and receiving end voltages.

SECTION – B

7. a) Explain the significance of load flow analysis in power system. 7

   b) Compare GS and NR methods in load flow studies. 7

OR

8. a) Classify the various buses in power system for load flow analysis. 7

   b) Explain "Network modelling" with a suitable example. 7

9. a) Explain the various methods to improve string efficiency. 6

   b) A string insulator Consist of 3 units. The capacitance from each joint to tower is 12% of the capacitance of each unit. Determine the voltage across the lowest unit as a percentage of the total voltage. Also calculate string efficiency. 7

OR

10. a) Explain the common tests that are carried out on insulators and its purpose. 7

    b) Draw and explain various types of line supports. 6

11. a) Explain oil filled cables with advantages and disadvantages. 6

    b) Describe the various methods of laying the cables. 7

OR

12. a) Compare the overhead lines and under ground cables. 7

    b) A 33kV, 3 phase underground cable 4km long has 3 single core cables. Each of the conductor has a diameter of 2.5cm and radial thickness of insulation is 0.5cm. The relative permittivity of a dielectric is 3.0. 6
    Determine
    i) Capacitance of each cable per phase.
    ii) Total charging KVAR.

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