

[06 – 3219]

III/IV B.E. DEGREE EXAMINATION.

Second Semester

Electrical and Electronics Engineering

TRANSMISSION AND DISTRIBUTION

(Effective from the Admitted Batch of 2006–2007)

Time : Three hours

Maximum : 70 marks

Question No. 1 is compulsory.

Answer any FOUR from the remaining.

All questions carry equal marks.

1. (a) Explain the advantages of HVDC transmission over EHVAC transmission.
- (b) Explain briefly about transposition of power lines.
- (c) Explain clearly the Ferranti effect.
- (d) List out different methods of reducing corona loss.

8. (a) What is Corona? Explain the corona formation in detail.
- (b) A certain 3- $\phi$  equilateral transmission line has a total corona loss of 53 kW at 106 kV and a loss of 98 kW at 110.9 kV. What is the disruptive critical voltage? What is the corona loss at 113 kV?

- (e) What is Sag-template? Explain how this is useful for location of towers and stringing of power conductors.
- (f) Obtain the expression for insulation resistance of a cable.
- (g) Explain about strain type insulator.
2. (a) Explain the technological development in control and protection for better performance and reliability of DC transmission system.
- (b) For a fixed power of transmission, explain how the economic choice of voltage level is selected in DC transmission system.
3. (a) What is meant by firing angle delay and commutation delay? Draw the circuit diagram, voltage and current wave forms of greutz circuit when  $\alpha = 30^\circ$  and  $\mu = 15^\circ$ .
- (b) A bridge connected rectifier fed from 238 kV/110 kV transformer from 238 kV supply. Calculate the direct voltage output when the commutation angle is  $20^\circ$  and delay angle is  $60^\circ$ .

4. (a) Find the  $A$ ,  $B$ ,  $C$ ,  $D$  parameters of a 3- $\phi$  80 km, 50 Hz transmission line with series impedance of  $(0.15 + j 0.78)$  ohm per km and a shunt admittance of  $j5.0 \times 10^{-4}$  mho/km.
- (b) Derive the  $A$ ,  $B$ ,  $C$ ,  $D$  parameters of medium line from nominal T-method.
5. (a) With reference to long transmission line, give physical interpretation of the terms of characteristic impedance and propagation constant.
- (b) Explain the classification of lines based on their length of transmission.
6. (a) Is sag a necessity or an evil? Discuss and what are the mechanical principles should be followed while designing the transmission line.
- (b) Derive the sage magnitude when supports are at equal levels.
7. (a) A string at 6 insulator units has mutual capacitance 10 times the capacitance to ground. Determine the voltage across each unit as a traction of operating voltage. Also determine string efficiency.
- (b) What are the basic tests to be carried out on insulators?