

1059

B.E. (Electrical and Electronics Engineering)

Fourth Semester

EE-403: Power Systems – I

Max. Marks: 50

Allowed: 3 Hours

Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

I Attempt the following:-

- a) Compare conductor cost on the basis of DC and AC supply.
- b) Advantage of bundled conductors.
- c) What is the effect of vibration on transmission lines.
- d) A travelling wave suffers reflection when it reaches discontinuity.
- e) Define string efficiency and its importance. (5x2)

UNIT – I

- II a) Explain capacitive grading of cables.
- b) Derive the capacitance of a three core belted cable. (2x5)
- III a) Explain factors that affect sag.
- b) Why insulators are fitted with horns. A string has three discs. The capacitance of pin to earth is 25% of the capacitance of disc. Find the ratio of voltage across the discs and string efficiency. (2x5)

IV Discuss the behaviour of a travelling wave when it reaches the end of (i) open circuited (ii) short circuited (iii) terminated by inductance (iv) line terminated by inductance. (10)

UNIT – II

- V a) Derive the expression for calculating internal and external internal flux linkages of a conductor carrying current. Derive expression for inductor of a single phase line.
- b) Derive the expression for the capacitance of bundled conductor lines two sub conductors per phase. (2x5)

VI Find the A,B,C,D parameters, sending end voltage, power angle of a 3-phase, 250 km, 50 Hz transmission line with series impedance of $(11 + j100)$ ohm per phase and a shunt admittance of 1.3×10^{-3} mho per phase. The line delivers 250 MW at unity p.f. and at 275kV. (10).

VII Draw phasor diagram of a nominal T circuit of a transmission line. Derive expression for sending end voltage and current. (10)

x-x-x