

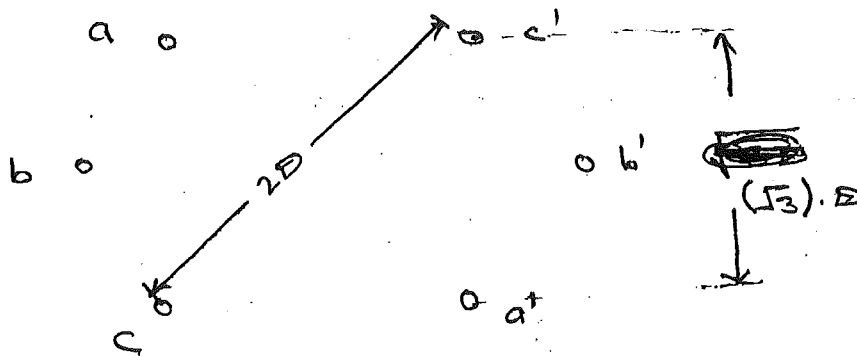
Con. 6670-13.

(3 Hours)

[Total Marks : 100

N.B. (1) Question No. 1 is **compulsory**.(2) Solve any **four** questions out of remaining **six** questions.(3) Assume suitable data if **necessary**.

1. (a) What are bundled conductor and discuss the advantages.
 (b) Explain transmission line parameters R, L, C and G.
 (c) Explain clearly the Ferranti effect with phasor diagram.
 (d) Write the difference between overhead and underground system.
2. (a) A conductor consist of seven identical strands each having a radius of r. Determine the factor by which r should be multiplied to find the self GMD of the conductor.
 (b) Derive the expression for the capacitance per km of a single phase line taking into account effect of ground.
3. (a) A three phase double circuit line has a conductors at the vertices of a Hexagon. Find –
 (i) Formula for calculating capacitance per phase per km in terms of side D and conductor radius r.
 (ii) If $D = 3.5$ m and $r = 1.09$ cm find capacitance/phase/km and capacitance/conductor/km.



- (b) Determine the ABCD constants of the medium line represented by nominal π and draw its Phasor diagram.
4. (a) What is skin effect. Explain sag and its factor for the overhead line.
 (b) A 50Hz transmission line of 300 km long has a total series impedance of $40 + j125$ ohms and a total shunt admittance of 10^{-3} mho. The receiving end load is 50 MW at 220 kV. with 0.8 p.f. lag. Find the sending end voltage, current and power using–
 (i) Short line approximation
 (ii) Nominal π method.

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5. (a) What is PU systems. Explain its advantages and disadvantages.
(b) Each line of a three phase system is suspended by a string of 3 similar insulator. If the voltage across the line unit is 17.5 kV, calculate the line to neutral voltage. Assume that the shunt capacitance between each insulator and earth is $\frac{1}{8}$ th of the capacitance of the insulator itself. Also find string efficiency.
6. (a) Explain grading of cables in detail.
(b) What is surge impedance and surge impedance loading ? Explain in detail.
7. Write a short notes on any **two** :-
(a) Step and touch potential
(b) Tuned power line.
(c) Measurement of earth resistance and soil resistivity.
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