

- N.B. :** (1) Question No. 1 is compulsory.
 (2) Attempt any four questions out of remaining six questions.
 (3) Assume required data.

1. (a) Draw typical AC supply system. 5
 (b) What is skin effect ? 5
 (c) Write advantages of per unit system. 5
 (d) Explain and draw H-type cable. 5
2. (a) The arrangement of conductors of a single phase transmission line is shown in figure wherein the forward circuit is composed of three solid wires 2.5 mm in radius and the return circuit of two-wires of radius 5 mm placed symmetrically with respect to the forward circuit. Find the inductance of each side of the line and that of complete line. 10

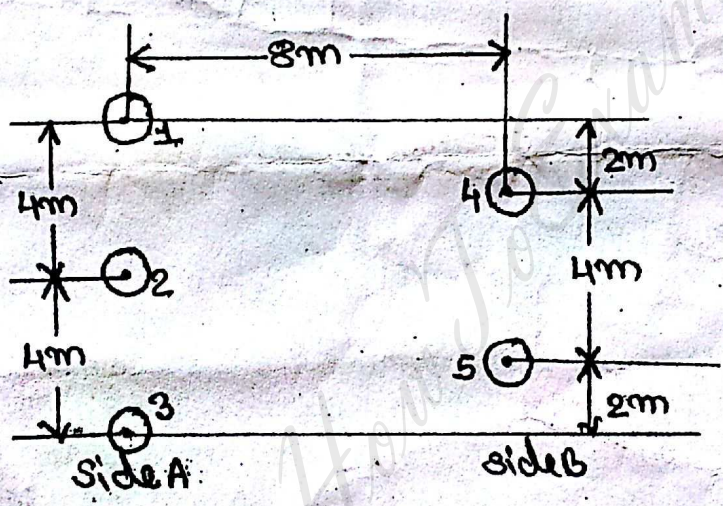
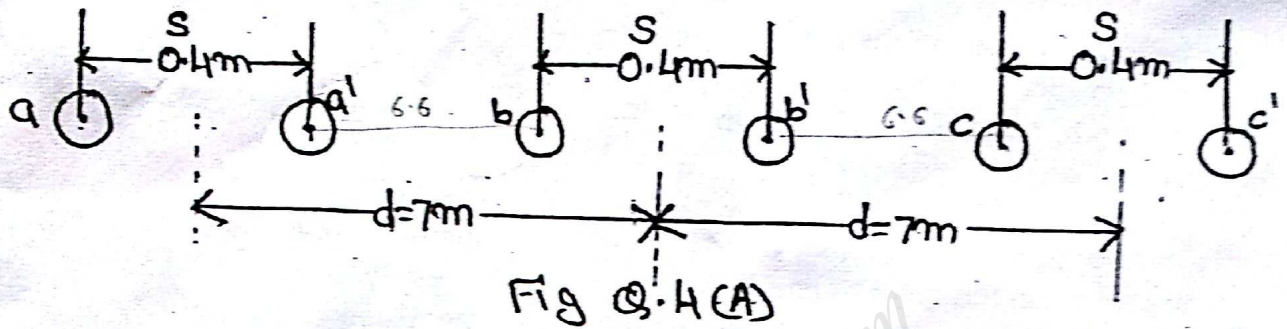


Fig: Q.2(A)

- (b) Explain in brief Grading of cable. 10
3. (a) What is cross-arms and line supports. An overhead line, over a river crossing is supported by two towers 50 m and 80 m above water level. The horizontal span is 300 m. If the weight of conductor is 8.28 N/m and the tension in the conductor is 19620 N. Find the height of mid point of the line above water level. 10
- (b) Derive Inductance of a single-phase two wire line. 10

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4. (a) What is Bundled conductors ? Find the inductive reactance in ohms per kilometer at 50 Hz of a three-phase bundled conductor line with two conductors per phase as shown in figure. All the conductors are ACSR with radii of 1.725 cm. 10



- (b) What is string efficiency and methods of improving string efficiency ? 10
5. (a) Calculate ABCD parameters for nominal π circuit and also draw phasor diagram for same. Using nominal π method, find the sending end voltage and voltage regulation of a 250 km, three phase, 50 Hz, Transmission line delivering 25 MVA 0.8 lagging power factor to balanced load at 132 kV. The line conductors are spaced equilaterally 3 m apart. The conductor resistance is 0.11 Ω /km and its effective diameter is 1.6 cm. Neglect leakage. 12
- (b) What is difference between step voltage and touch Voltage. 8
6. (a) Derive capacitance of a Three-phase line with equilateral spacing. A Three-phase 50 Hz transmission line has flat horizontal spacing with 3.5 m between adjacent conductors. The conductors are No. 210 hard-drawn seven strand copper (outside conductor diameter = 1.05 cm). The voltage of line is 110 kV. Find the capacitance to neutral and the charging current per kilometer of line. 10
- (b) Explain with advantages and disadvantages of Solid Grounding and Resistance Grounding. 10
7. Write short notes on :- 20
- (a) Types of insulators
 - (b) Surge Impedance loading
 - (c) Transposition in Transmission line.
 - (d) Effect of earth on capacitance of a single-phase line.