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BOARD DIPLOMA EXAMINATION, (C-16)

JUNE/JULY—2022

DEEE - FIFTH SEMESTER EXAMINATION

POWER SYSTEMS - II (T, D AND P)

Time : 3 hours] [*Total Marks* : 80

PART—A

3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. State the need of transmission lines and distribution lines.

2. What is skin effect?

3. Write any three applications of hot line techniques.

4. State any three locations of HVDC transmissions in India.

5. List any three factors influencing the selection of line supports.

6. Classify the underground cables based on voltage ratings.

7. State the need of a substation.

8. Define feeder and distributor.

9. Compare radial and ring distribution system in any three aspects.

10. List any three causes of bus bar faults.

PART—B

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. A 3-phase line, 3 km long delivers 3000 kW at a power factor of 0·8 (lagging) to a load. If the voltage at supply end is 11 kV, determine the voltage at load end and efficiency of transmission. The resistance and reactance per km of each conductor are 0·4 Ω and 0·8 Ω respectively. 10

12. *(a)* Derive an expression for the voltage regulation of a short transmission line. 5

(b) What is Corona in transmission lines and explain the methods to reduce Corona in overhead lines. 5

13. A transmission line conductor having a dia of 19·5 mm and weighs of 0·87 kg/m. The span is 275 meters. The wind pressure is 39 kg/m^2 of projected area with ice coating of 13 mm. The ultimate strength of the conductor is 8000 kg. Calculate the maximum sag if the factor of safety is 2 and ice weighs 910 kg/m^3. 10

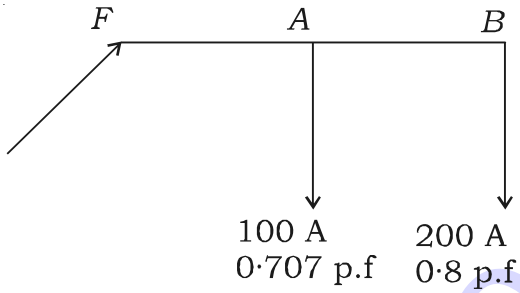
14. Define string efficiency and explain the methods to improve string efficiency. 3+7=10

15. *(a)* Derive an expression for insulation resistance of a cable. 5

(b) Find the insulation resistance per km of a cable of conductor diameter 1·2 cm and internal sheath diameter of 1·75 cm. Resistivity of the dielectric is 6×10^{12} Ω-m. 5

14. Explain various equipments used in substations. 10

17. A two-wire AC feeder is loaded as shown in figure. The power factors are lagging and are referred to the voltages at the respective load points. The section impedance $FA = 0{\cdot}03 + j\,0{\cdot}05$ ohm and $AB = 0{\cdot}05 + j\,0{\cdot}08$ ohm. If the voltage at the far end is to be maintained at 230 volts. Calculate the voltage at supply end. 10



18. Explain the protection of parallel feeders using directional relays. 10

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