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BOARD DIPLOMA EXAMINATION, (C–09)

APRIL/MAY—2015

DEEE—SIXTH SEMESTER EXAMINATION

POWER SYSTEMS—II

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. Briefly write the need of transmission and distribution lines.

2. State Ferrantic effect.

3. List any three locations of HVDC transmission systems in India along with their ratings. 1×3=3

4. State the factors which affect the conductor spacing and ground clearance in overhead lines.

5. Define flashover, puncture and string efficiency. 1×3=3

6. Classify substations according to their service.

7. State the classification of cables according to voltage.

8. Explain feeder, distributor and service mains.

9. Draw the schematic diagram of pilot-wire protection using circulating current principle.

10. State requisite characteristics of a good lightning arrester.

PART—B

10×5=50

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

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

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

11. Derive an expression for the capacitance/conductor/km between two long parallel conductors each having a radius of r metres and separated by a distance of D metres.

12. Calculate the sending end voltage of a 1- line having an impedance of 0·22 + j 0·36 to deliver a load of 500 kVA at 2000 V, when the p.f. is *(a)* unity and *(b)* 0·707 lag.

13. *(a)* Write down the advantages of hot-line technique over cold-line technique and list out the typical applications where hot-line technique is used. 5

(b) Draw line diagram of the layout of a 132/11 kV substation and label the parts. 5

14. *(a)* State the main components of overhead line. 5

(b) Derive an expression for the sag when the supports are at equal level. 5

15. Each conductor of a 33 kV, 3- system is suspended by a string of three identical insulators, with mutual capacitance across units equal to 8 times the shunt capacitance between units and earthed framework. Calculate the voltage across each insulator.

16. A 1- a.c. distributor 2 km long, supplies loads of 140 A, 0·9 lag at its far end and 90 A, 0·8 lag at its midpoint. Both p.f.s. are referred to the voltage at far end. The resistance and reactance per km of go and return are 0·5 and 0·1 respectively. Calculate the voltage at sending end, if the voltage at far end is maintained at 230 V.

17. Explain the protection of transmission lines using impedance relay with a neat sketch.

18. Elaborately explain the methods of solid and resistance groundings with neat sketches and phasor diagrams.

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