C09–EE–**606**

3769

BOARD DIPLOMA EXAMINATION, (C–09)
OCT/NOV—2016
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. State any three advantages and disadvantages of DC transmission.

2. State Ferranti effect.

3. What is the need of converter station in HDVC transmission?

4. Mention any six components of overhead lines.

5. Compare between pin and suspension insulators in any three aspects.

6. Give any three reasons why we need substations.

7. What is the purpose of armour in underground cables? Explain.

8. Define primary and secondary distribution.

9. Draw the schematic of pilot wire protection.

10. List the six methods of neutral grounding.

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

(b) A power of 250 kW is delivered at the end of a single-phase line 15 km long at 1000 V, 0·8 p.f. lag and 50 Hz frequency. The resistance of the conductor is 0·03 /km and the inductance/conductor/km is 0·15 mH. Find the sending-end voltage, sending-end p.f. and % regulation. Draw the vector diagram. 5

12. Using nominal- method, find the regulation and efficiency of a 3-phase, 50-Hz transmission line when delivering a balanced load of 24 MVA at 0·8 p.f. lag. The receiving-end voltage is 66 kV. Resistance, inductance and capacitance per phase are 9·6 , 0·97 H and 0·765 F respectively. 10

13. *(a)* What is corona? What are the factors affecting corona? 5

(b) Draw a neat figure of underground cable and explain the parts. 5

14. *(a)* What is sag? Explain the factors which influence the sag in overhead lines. 5

(b) A transmission line has a span of 300 m. The diameter of the conductor is 2 cm and weight is 0·9 kg/m. If the conductor has an ice coating of radial thickness 1·3 cm, find the sag. Take ultimate strength = 9000 kg, weight of ice = 0·9 gm/cc, safety factor = 2. 5

15. *(a)* Define string efficiency. Explain the methods of improving string efficiency. 5

(b) Write short notes about *(i)* PSCC and *(ii)* steel towers. 5

16. *(a)* Write short notes about feeder, distributor and service main. 4

(b) A single-phase a.c. distributor *AB* 300 mts is fed from end *A* and is loaded as under :

100 amp at 0·707 p.f. lag, connected at 200 mt from end *A*

200 amp at 0·8 p.f. lag, connected at 300 mt from end *A*

The total resistance and reactance of the distributor are 0 2   and 0 1   per km respectively. Calculate the total voltage drop in the distributor. The load power factors refer to the voltage at the far end. 6

17. *(a)* Explain the protection of radial feeder. 5

(b) Explain the protection of parallel feeders using directional relays. 5

18. *(a)* Explain rod gap lightning arrestor with a neat diagram. 5

(b) Explain solid grounding with a neat diagram. 5

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