



C09-EE-606

**3769**

**BOARD DIPLOMA EXAMINATION, (C-09)  
OCT/NOV—2017  
DEEE—SIXTH SEMESTER EXAMINATION  
POWER SYSTEM—II**

Time : 3 hours ]

[ Total Marks : 80

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**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. Compare between solid and hollow conductors in any six aspects.
2. What are (a) skin effect and (b) Ferranti effect.
3. Write any six limitations of HVDC transmission system.
4. What is the need of (a) cross arm and (b) pole guys.
5. Compare any three relative merits of pin and suspension insulators.
6. Draw a neat sketch of 3 core H-type cable.
7. Compare between outdoor and indoor substations in any six aspects.

- \* 8. Write any three advantages and disadvantages of radial distribution system.
9. Write the effects of pilot wire relaying system.
10. What are the types of ground the neutral?

**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) A single-phase 11 kV line with a length of 15 km is to transmit 500 kVA. The inductive reactance of the line is 0.5 ohm/km and the resistance is 0.3 ohm/km. Calculate the efficiency and regulation of the line for 0.8 lagging power factor. 5
- (b) Explain the charging current in transmission lines and power loss due to it. 5
12. A 3-phase 50 Hz, 250 km overhead transmission line delivers a load of 25 MVA, at 132 kV and 0.8 p.f. lagging. For whole length of the line, the resistance and inductive reactance of the line are 27.5 ohms and 97.4 ohms per phase respectively, while shunt admittance is  $7.38 \times 10^{-4}$  mho per phase. Calculate (a) sending end current, (b) sending end voltage (line to line) and (c) voltage regulation. Use nominal method. 10
- \* 13. (a) What is corona? State the factors affecting it. 5
- (b) Compare overhead line with underground cables in any five aspects. 5

- \* **14.** (a) Derive an expression for sag in overhead lines when the supports are at equal levels and the tension is governed by the conductor weight only. 5
- (b) A transmission line has a span of 150 m between level supports, the conductor has a cross-sectional area of  $2 \text{ cm}^2$ . The ultimate strength is  $5000 \text{ kg/cm}^2$ . The specific gravity of the material is  $8.9 \text{ gm/cm}^3$  the wind pressure is  $1.5 \text{ kg/m}$  length of the conductor. Calculate the sag at the centre of line, if the factor of safety is 5. 5
- 15.** (a) What are causes of failure of insulators? 5
- (b) A three-phase overhead transmission line is being supported by three-disc insulators. The potential across the top and middle units are 8 kV and 11 kV respectively. Calculate (i) ratio of capacitance between pin and earth to self-capacitance of each unit (ii) the line voltage and (iii) string efficiency. 5
- 16.** A single-phase a.c. distributor AB 300 m long is fed from end A and loaded as follows :
- (a) 100 A at 0.707 p.f. lagging 200 m from point A
- (b) 200 A at 0.8 p.f. lagging 300 m from point A
- The total resistance and reactance of the distributor are 0.2 and 0.1 per km. Calculate the voltage at sending end when the load p.f. referred to voltage at far end of 230 V.
- 17.** (a) Explain protection of radial feeders using time graded over current relays. 5
- (b) Explain protection of parallel feeders using directional relays. 5
- \* **18.** (a) Explain the working of Thyrite type lightning arrester with a neat diagram. 5
- (b) Explain how the arcing grounds are reduced in Peterson coil grounding. 5

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