3769

BOARD DIPLOMA EXAMINATION, (C–09)
MARCH/APRIL—2017
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. Write a short note on proximity effect.

2. Write the application of hot-line technique.

3. Draw the schematic diagram of HVDC transmission system.

4. State any three causes for failures of insulators.

5. State the types of poles used in overhead lines.

6. Write any six types of equipments used in substations.

7. State the classification of substation according to service.

8. Compare radial and ring main distribution systems in three aspects.

9. Draw a schematic diagram of pilot wire protection using circulating current differential relays.

10. State any three disadvantages of undergrounded 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. Compare the volume of conductor material required in DC 2-wire and AC 3-phase, 3-wire system in underground lines.

12. A 3- , 3 km long delivers 3000 kW at 0·8 p.f. lagging to a load. The resistance and inductive reactance per km of each conductor are 0·4 and 0·5 respectively. If the voltage at supply and is maintained at 11 kV, calculate *(a)* receiving end voltage, *(b)* line current and *(iii)* efficiency.

13. *(a)* Draw a neat diagram of stay arrangement and label the parts.

(b) Write the method of earthing 33 kV lines on RCC and PSCC poles.

14. *(a)* Explain the effect of wind and ice load on sag.

(b) Calculate the sag in an OH line under the following conditions :

Length of span = 150 m
Cross-sectional area of conductor = 125 mm^2
Breaking strength = 42 kg/mm^2
Factor of safety = 5
Weight of the conductor = 0·859 kg/m

15. A two-wire AC distributor is loaded as shown in the figure below. The power factors are lagging and referred to the voltage at far end. The section impedances of *AB* and *BC* are $(0·03+ j0·05)$ and $(0·05+ j0·08)$ respectively. If the voltage at far end is 230 V, calculate the voltage drop over *AC*. Also draw the vector diagram :

100 A, 0·707 pf   200 A, 0·8 pf
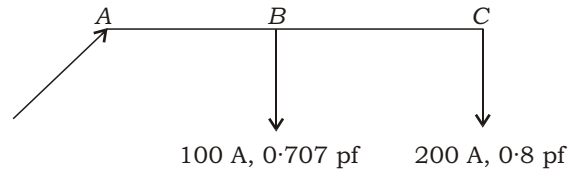
16. *(a)* Explain the protection of parallel feeders using directional relays.

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

17. Explain construction and working principle of thyrite-type lightning arrestor.

18. *(a)* Derive the expression for power loss due to charging current.

(b) Derive an expression for insulator resistance of a cable.

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