



C09-EE-606

3769

BOARD DIPLOMA EXAMINATION, (C-09)
OCT/NOV—2013
DEEE—SIXTH SEMESTER EXAMINATION
POWER SYSTEMS—II

Time : 3 hours]

[Total Marks : 80

PART—A

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

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

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

1. State any three relative advantages of AC transmission system over DC transmission system.
2. State Ferranti effect.
3. State any three places of HVDC projects located in India.
4. State the main requirements of line supports.
5. State the factors that affecting the conductor spacing and ground clearance in overhead lines.
6. State the types of instrument transformers used in substations.
7. State the use of capacitor banks in substations.

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8. Define (a) feeder and (b) distributor.
9. Write a short note on pilot-wire protection system.
10. State the need of neutral grounding.

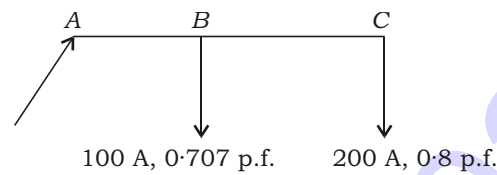
PART—B

- 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 3- transmission line delivers 3600 kW at a p.f. 0.8 lagging to a load. If the sending end voltage is maintained at 33 kV, determine the receiving end voltage and transmission efficiency. Take the resistance and reactance of each conductor are 5.31 and 5.34 respectively.
 12. Derive the expression for capacitance in a single-phase overhead transmission line.
 13. (a) Derive the expression for sags when the supports are at different levels.
(b) An overhead transmission line has a span of 240 m between level supports. If the conductor weight is 727 kg/m and breaking strength is 6880 kg, find the minimum ground clearance allowing a factor of safety of 2. Neglect wind and ice loading.
 14. An insulator string consists of 3 units each having a safe working voltage of 15 kV. The ratio of self-capacitive to shunt capacitive of each unit is 8:1. Find the maximum safe working voltage of the string and string efficiency.

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15. A single-phase AC distributor is loaded as shown in the figure below. The power factors are lagging and referred to the voltage at the respective load points. The section impedances $AB = 0.03 + j0.05$ and $BC = 0.05 + j0.08$. If the voltage at the far end is 230 V, calculate the sending voltage :



16. (a) Explain the protection of radial feeders by time graded relays.
(b) Explain the protection of parallel feeders by directional relays.
17. Explain the construction and working principle of valve-type lightning arrester.
18. (a) Write the expressions for—
(i) critical disruptive voltage;
(ii) power loss due to corona.
- (b) Find the insulation resistance per km of a cable of conductor diameter 1.2 cm and internal sheath diameter 1.75 cm. Resistivity of the dielectric is 6×10^{12} -m.
