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C14–EE–503

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BOARD DIPLOMA EXAMINATION, (C–14)

MARCH/APRIL—2018

DEEE—FIFTH SEMESTER EXAMINATION

POWER SYSTEMS—II (T&D)

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 two merits and two demerits of AC transmission.

2. State and explain in brief proximity effect.

3. Define corona and factors on which it depends.

4. State the principle of HVDC transmission system.

5. State the advantages and disadvantages of steel towers.

6. List the various types of insulators used for overhead transmission lines.

7. Classify the underground cables on the basis of number of conductors.

8. State the need for substation.

9. Define feeder and distributor.

10. List the advantages of radial system.

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 the expression for capacitance in single-phase overhead transmission line.

12. An overhead 3-phase transmission line delivers 4900 kW at 22 kV at 0·8 lagging power factor. The resistance and reactance of each conductor are 4 and 6 respectively. Determine *(a)* sending-end voltage, *(b)* percentage regulation, *(c)* total line losses and *(d)* transmission efficiency.

13. *(a)* Explain the concept and application of hot-line technique in a transmission line. 5

(b) Explain ring main system. 5

14. *(a)* List the factors affecting sag. 5

(b) Explain the method of calculating sag when supports are at unequal heights. 5

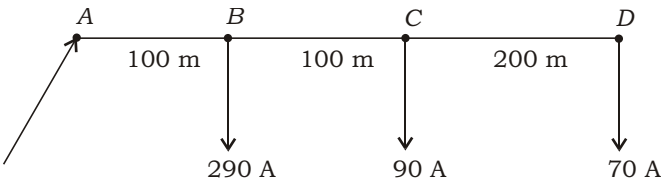
15. A single-phase 20 kV overhead line has three units in the string of insulators on each tower. The ratio of shunt capacitance to self-capacitance is 1 : 10. Find the distribution of voltage over the three insulators and find string efficiency.

16. *(a)* Compare between overhead lines and underground cables. 5

(b) Find the insulation resistance per km of a cable of conductor diameter 1·95 cm and internal sheath diameter 2·7 cm. Resistivity of the dielectric is 6×10^{12} -m. 5

17. List any five equipments used in substation and state the purpose of each.

18. A DC 2-wire distributor, 400 meter long and fed at one end is loaded as shown in figure below. The total resistance of the distributor is 0·024 . Calculate the voltage at the end *A* when the voltage at the end *D* is 220V.



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