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BOARD DIPLOMA EXAMINATION, (C-16)

MAY/JUNE—2023

DEEE - FIFTH SEMESTER EXAMINATION

POWER SYSTEMS—II (T, D AND P)

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 of AC transmission system over DC transmission system.
2. State Ferranti effect.
3. Define regulation in transmission line.
4. List the types of HVDC systems.
5. State any three factors on which the conductor spacing and ground clearance depends.
6. State the functions of the following in the construction of cables :
 - (a) Bedding
 - (b) Armouring
 - (c) Serving
7. Classify the substations according to service.

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8. What is the difference between a feeder and distributor?
 9. State any three advantages of ring main distribution system.
 10. Draw the schematic diagram of pilot wire protection.

PART—B

10×5=50

Instructions : (1) Answer *any five* questions.
 (2) Each question carries **ten** marks.
 (3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. An overhead 3-phase transmission line delivers 5 MW at 22 kV at 0.8 lagging power factor. The resistance and reactance of each conductor are 4Ω and 6Ω respectively. Determine (a) sending end voltage, (b) percentage regulation, (c) total line losses and (d) transmission efficiency. 10
12. (a) Explain corona in transmission lines and state the factors affecting corona. 6
 (b) State the disruptive critical voltage and give its formula. 4
13. Derive an equation for the approximate method of calculating sag. 5+5
 (a) When the supports are at the same level in still air.
 (b) When the supports are at different levels.
14. A 3-phase overhead transmission line is being supported by three disc insulators. The potential across top unit and middle unit are 8 kV and 11 kV respectively. Calculate (a) ratio of capacitance between pin and earth to the self-capacitance of each unit, (b) the line voltage and (c) string efficiency. 10
15. Explain the construction of High Tension (HT) underground cable with a neat sketch. 10

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- 16.** List the various equipments used in substations and state the purpose of each equipment. 10
- 17.** A single-phase AC 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 resistance and reactance of the distributor are 0.2Ω and 0.1Ω per km. Calculate the voltage at the sending end when the load p.f refer to the voltage at far end of 230 V. 10
- 18.** Explain the protection of radial feeders using time graded protection scheme. 10

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