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C09-EE-403

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BOARD DIPLOMA EXAMINATION, (C-09)
MARCH/APRIL—2016
DEEE—FOURTH SEMESTER EXAMINATION

POWER SYSTEMS—I

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 the advantages of solar power plant.

2. State the disadvantages of thermal power stations.

3. State the functions of forebay in hydroelectric power station.

4. State the merits of nuclear power stations.

5. Explain about load curve.

6. Define TARIFF.

7. State the advantages of air blast circuit breakers.

8. State the functions of relay.

9. State various schemes of protection system used in transformers.

10. State the need of overvoltage protection in alternators.

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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)* State the functions of *(i)* boiler and *(ii)* condenser. 5

(b) State the functions of *(i)* turbines and *(ii)* alternator. 5

12. *(a)* Write the factors to be considered for selection of site for hydropower plant. 6

(b) Derive water power equation. 4

13. Explain the scheme of maintenance of nuclear power plant.

14. *(a)* Explain the methods of improving the power factor of the system. 5

(b) A single-phase motor takes a current of 10 amps at a p.f. of 0·707 lag from a 230-V, 50-Hz supply. What value must have a shunting condenser to raise the p.f. to unity? 5

15. A 3-phase transmission line operating at 10 kV and having a resistance of 1 Ω and reactance of 4 Ω is connected to the generating station bus bars through 5 MVA step-up transformer having a reactance of 5%. The bus bars are supplied by a 10-MVA alternator having 10% reactance. Calculate the short-circuit kVA fed to symmetrical fault phases if it occurs—

(a) at the load end of transmission line;

(b) at the high voltage terminals of the transformer.

16. Explain the construction and working principle of impedance relay with sketch.

17. Explain the differential protection scheme of transformers.

18. *(a)* Explain the need of coolant and control rods in nuclear power plant. 5

(b) Compare between isolated and integrated operation of power stations. 5

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