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C09–EE–403

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BOARD DIPLOMA EXAMINATION, (C–09)

OCT/NOV—2014

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 need of non-conventional energy sources.

2. What is meant by energy auditing?

3. Classify the hydroelectric power stations on the basis of load.

4. State the advantages of gas power stations.

5. State the methods to improve the power factor of power system.

6. State the factors affecting the cost of generation.

7. State the properties of SF_6 circuit breaker.

8. State the characteristics of the relay.

9. State the need of over-voltage protection in alternators.

10. State the different types of fault occurred in alternators.

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 methods to control pollution in thermal power plant. 5

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

(b) Write in brief about maintenance activity carried in hydro power plant. 4

13. Explain the fission and fusion reactions with mass-energy balance equations.

14. The load on a power plant on a particular day is as follows in the load demand of a residential consumer :

Sl. No.	*Time*	*Load* (in MW)
1	12 mid-night to 5 AM	20
2	5 AM to 8 AM	60
3	8 AM to 6 PM	100
4	6 PM to 8 PM	120
5	8 PM to 10 PM	80
6	10 PM to 12 mid-night	20

Plot the load curve and determine *(a)* maximum demand, *(b)* average load, *(c)* load factor and *(d)* diversity factor.

15. A generating station has two alternators of ratings 4000 kVA and 6000 kVA and of percentage reactances 10% and 8% respectively connected from the common bus-bars. The load is taken to the feeder through a 12000 kVA transformer of 5% reactance. What should be the short circuit kVA and the approximate rating of circuit-breaker, if the fault occurs on the feeder?

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

17. Explain the working of Buchholz relay with neat sketch.

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

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

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