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C09–EE–403

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BOARD DIPLOMA EXAMINATION, (C–09)

MARCH/APRIL—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 disadvantages of wind power plant.

2. State the need of cooling towers used in thermal power station.

3. State the disadvantages of hydroelectric power stations.

4. State the merits of nuclear power stations.

5. Define maximum demand.

6. What is meant by load dispatching?

7. State the types of arc quenching mediums used in circuit breakers.

8. Classify the different types of relays on the basis of working principle.

9. List the different types of faults in transformers.

10. State the various schemes of protection systems used in transformers.

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. Explain the function of each block of thermal power plant with line diagram.

12. *(a)* State the factors affecting the selection of site for hydroelectric power station. 5

(b) Explain with layout diagram of high-head hydroelectric power station. 5

13. State and explain the nuclear fission and fusion reactions in nuclear power station.

14. A generating station has a maximum demand of 100 MW. Calculate the cost per unit generated from the following data :

Interest and depreciation = 15%

Capital cost = ₹ 1,500 per kW installed

Annual cost of fuel oil = ₹ 10 10^6

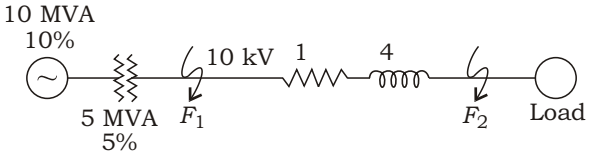
Taxes, wages and salaries = ₹ 11 10^6

Annual load factor = 40%

15. A 3-phase transmission line operating at 10 kV and having a resistance of 1 and reactance of 4 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 symmetrical fault phase 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.

17. Explain differential protection scheme of transformers.

18. *(a)* Compare nuclear power plant and hydroelectric power plant in various aspects.

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

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