3475

BOARD DIPLOMA EXAMINATION, (C–09)
APRIL/MAY—2015
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. What are the disadvantages of non-conventional energy sources?

2. State the disadvantages of thermal power stations.

3. Classify the hydroelectric power stations on the basis of available head.

4. State the demerits of nuclear power station.

5. Define the terms *(a)* load factor and *(b)* diversity factor.

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

7. Write the uses of current limiting reactor.

8. State the uses of impedance relays.

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

10. State the need of overvoltage protection in alternators.

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 causes of pollution in thermal power plant. 4

(b) Explain the maintenance of *(i)* turbines and *(ii)* alternators in thermal power plant. 6

12. *(a)* What are the factors to be considered while selection of site for hydroelectric power station? 6

(b) A hydroelectric power plant operates under an effective head of 50 metres and a discharge of 94 m^3/sec. Determine the power developed assuming $_{overall}$ 80%. 4

13. Explain the working of nuclear power station with block diagram.

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

(i) Interest and depreciation ₹ 15%

(ii) Capital cost ₹ 1,500 per kW installed

(iii) Annual cost of fuel oil ₹ 10 10^6

(iv) Taxes, wages and salaries ₹ 11 10^6

(v) Annual load factor 40%

15. *(a)* Write the different arc quenching methods. 4

(b) Classify the reactors with neat sketch. 6

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

17. Explain differential protection system in transformers.

18. *(a)* Compare nuclear and gas power plants in any four aspects. 5

(b) Explain the effects of cost of generation if the load factor and diversity factor are varied. 5

★ ★ ★