7247

BOARD DIPLOMA EXAMINATION, (C-20)

MAY—2023

DEEE - THIRD SEMESTER EXAMINATION

POWER SYSTEMS—I (GENERATION)

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. List any three merits of conventional energy sources.

2. State the need of energy conservation.

3. List the types of cooling towers in thermal power plants.

4. State any three methods of controlling pollution in thermal power plants.

5. State the function of economizer in thermal power plant.

6. Classify the hydroelectric power stations based on available head.

7. State the function of the following in hydroelectric power stations :

    (a) Spill gates

    (b) Forebay

8. List the types of reactors used in nuclear power stations.

9. Mention the main controls of gas turbine.

10. List any three causes of low power factor.

Instructions : (1) Answer **all** questions.

(2) Each question carries **eight** marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. *(a)* Explain the factors affecting the selection of site for thermal power plant.

(OR)

(b) Explain the methods to improve the efficiency of thermal power plant.

12. *(a)* Explain the working of hydroelectric power station with a neat sketch.

(OR)

(b) A hydroelectric power plant operates under an effective head of 50 m and a discharge of 95 m^3/sec. Determine the power developed. Assume, overall efficiency of 80%. Assume any missing data.

13. *(a)* Explain the working of nuclear power plant with a neat diagram.

(OR)

(b) State the merits and demerits of gas power stations.

14. *(a)* Explain any two methods of improving power factor.

(OR)

(b) The power factor of a single-phase motor connected to a 400 V, 50 Hz supply is 0·75 lagging. The motor draws a current of 25 A. Calculate the capacitance required in parallel with the motor, so as to improve power factor to 0·9 lagging.

15. *(a)* Compare isolated operation and integrated operation of power stations in any eight aspects.

(OR)

(b) The block rate Tariff is as follows :

First 60 kWh at ₹ 3·00 per kWh

Next 50 kWh at ₹ 2·80 per kWh

Next 40 kWh at ₹ 2·50 per kWh

Next 30 kWh at ₹ 2·20 per kWh

Excess over 180 kWh at ₹ 2·00 per kWh

Determine the cost of electrical energy and average unit cost for consuming 200 kWh.

PART—C   10×1=10

Instructions : (1) Answer the following question.

(2) The question carries **ten** marks.

(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

16. What is the major source of power generation in India? Though nuclear power generation gives cleaner energy, we are not able to produce more from it? Can you give the reasons?

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