



C14-EE-403

4463

**BOARD DIPLOMA EXAMINATION, (C-14)**  
**OCT/NOV—2016**  
**DEEE—FOURTH SEMESTER EXAMINATION**  
**POWER SYSTEMS—I (GENERATION)**

*Time* : 3 hours ]

[ *Total Marks* : 80

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**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 any three advantages of tidal power.
2. What is energy auditing?
3. What is pulverization?
4. State the need of surge tank.
5. State the disadvantages of hydroelectric power station.
6. State the uses of moderator in nuclear power plant.
7. List various risks involved in using nuclear energy.
8. State any three applications of solar photovoltaic system.

\* 9. Define (a) maximum demand and (b) diversity factor.

10. State any three disadvantages of low power factor.

**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) Explain the construction and working of biomass energy.

(b) State any five factors governing the selection of site for thermal power station.

12. Explain the working of thermal power station with a neat line diagram.

13. A hydroelectric power station has a catchment area of 3000 sq. km. The average rainfall in the area is 180 cm. The mean head available for turbine is 200 metres. Assuming seepage and losses as 25% and head lost in penstocks as 5%, calculate the power available from such a project. Assume overall efficiency as 80%. Also suggest suitable capacity and number of generators to be installed.

14. Explain the working of the following in nuclear power plants :

(a) Coolant

(b) Reflector

(c) Control rods

\* 15. What are solar collectors? Explain flat-plate collector with neat sketch.

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

- \* **17.** A thermal station has a maximum demand of 100 MW. Calculate the cost per unit generated from the following data :

Annual load factor = 40%

Capital cost = ₹ 1,500 per kW installed

Interest and depreciation = 15%

Annual cost of fuel oil = ₹  $10 \times 10^6$

Salaries, wages and taxes = ₹  $11 \times 10^6$

What would be the cost of unit generated, if the load factor is increased to 60% with a consequent increase in fuel costs by 10% and other cost remaining the same?

- 18.** (a) State the methods of improving the power factor.  
(b) A single-phase 400-V, 50-Hz motor connected across a supply draws a current of 40 A at a power factor of 0.6 lagging. The motor power factor is improved to 0.85 by connecting a condenser in parallel. Calculate the capacity of the condenser required.

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