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C20-EE–303

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BOARD DIPLOMA EXAMINATION, (C-20)

FEBRUARY/MARCH — 2022

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. State any three limitations of biomass energy.

2. List any three conventional and non-conventional energy sources.

3. State the working principle of a thermal power station.

4. Why is feed water treatment necessary in a steam power plant?

5. What is pulverization?

6. State the function of forebay.

7. Why do we need a surge tank in fly del power plant?

8. List any three major fields of applications of gas turbine.

9. What is 'radioactivity'?

10. What is the significance of two-part tariff?

PART—B

8×5=40

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 with a legible sketch, the working of an electrostatic precipitator.

(OR)

(b) Mention the factors affecting the selection of site for a thermal power station.

12. *(a)* Calculate the power developed by the hydro-electric power station having the following data :

Catchment area = 80 sq.km.

Average rain fall = 110 cm/year

Run-off = 80%

Available head = 250 meters

Overall efficiency of power station = 75%

(OR)

(b) Classify hydel power plant on the basis of availability of water head and explain.

13. *(a)* Draw a legible sketch of nuclear reactor and explain briefly the function of each component.

(OR)

(b) Compare hydroelectric power plant and nuclear power station in any eight aspects.

14. *(a)* The tariff in force is Rs. 200 per kVA of maximum demand plus 10 paise per unit consumed. If the load factor is 60%. Find the cost per unit at *(i)* unity power factor and *(ii)* 0.8 p.f. lagging.

(OR)

(b) The following is the load demand of a residential consumer :

S.No.	Time	Load in Watts
1.	12 midnight to 6 a.m.	60
2.	6 a.m.to 6 p.m.	No Load
3.	6 p.m.to 7 p.m.	180
4.	7 p.m.to 9 p.m.	300
5.	9 p.m. to 12 midnight	120

Plot the load curve and determine *(i)* maximum demand, *(ii)* average load, *(iii)* load factor and *(iv)* diversity factor.

15. *(a)* Discuss the effect of load factor and diversity factor on the cost of generation of electrical energy.

(OR)

(b) An industrial consumer has a tariff of Rs. 20 per kW of maximum demand plus 1 paise per kWh. If the consumer has a maximum demand of 100 MW at 60% load factor. Determine the overall cost per kWh.

PART—C

10×1=10

Instructions : (1) Answer the following question.

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

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

16. Analyse by flow chart the preparation of coal which affects the efficiency of a thermal power station.

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