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(Revision - 2015)

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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE, APRIL – 2021

POWER PLANT ENGINEERING

[Maximum Marks: 75] [Time: 2.15 Hours]

PART-A

(Answer ***any three*** questions in one or two sentences. Each question carries 2 marks)

I. 1. Define Calorific Value of Fuel.

2. State the purpose of compounding.

3. What is the function of an air pump in condenser?

4. Define jet propulsion.

5. State the use of moderator in a nuclear reactor. (3 x 2 = 6)

PART-B

(Answer any ***four*** of the following questions. Each question carries ***6*** marks)

II 1. List the required properties of a good fuel.

2. Classify boiler drought, explain balanced drought.

3. The inlet and outlet temperatures of cooling water to a condenser are 29^0C and 36^0C respectively. If the vacuum in the condenser is 705 mm of Hg with barometer reading 760 mm of Hg, find the condenser efficiency.

4. Draw a line sketch of seam power plant and mark its salient parts.

5. Compare gas turbine with steam turbine.

6. Explain with a neat sketch working of a geo thermal power plant.

7. Draw and explain the working of a nuclear power plant. (4 x 6 = 24)

PART-C

(Answer ***any of the three units*** from the following. Each full question carries 15 marks)

UNIT – I

III (a) Explain with a neat sketch the determination of HCV using a Bomb Calorimeter. (7)

(b) Explain Pressure Velocity compounding of Steam Turbine. (8)

OR

IV (a) Explain the terms reheating, bleeding and regenerating in a steam turbine. (7)

(b) List the merits and demerits of Solid liquid and gaseous fuels. (8)

UNIT – II

V (a) Illustrate the working of a counter flow jet condenser. (7)

(b) Explain in detail the principle of working of a Rankine cycle with the help of a PV and T ϕ diagram. (8)

OR

VI (a) Compute the thermal efficiency of Carnot cycle working between the boiler pressure of 15 bar and condenser pressure of 0.5 bar when

(i) Steam enters the condenser with a dryness fraction of 0.85.

(ii) Steam is at a temperature of 300^0C. (7)

(b) Compare jet condenser and surface condenser. (8)

UNIT- III

VII (a) Explain Turbo – Prop engine with the help of a sketch. (7)

(b) Explain with a neat sketch working of a diesel power plant. (8)

OR

VIII (a) With a neat sketch explain the working of a hydro-electric power plant. (7)

(b) Illustrate the working of a constant pressure open cycle gas turbine along with a PV and T ϕ diagram . (8)

UNIT - IV

IX (a) Describe the working of a bio gas plant with neat sketch. (7)

(b) Explain the working of a pressurized water reactor (PWR) with a line diagram. (8)

OR

X (a) Explain the working of a tidal power plant. (7)

(b) Explain nuclear fission, fusion and Chain reaction, How fission reactions are controlled in a nuclear reactor? (8)
