

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/
COMMERCIAL PRACTICE, APRIL-2022**

POWER PLANT ENGINEERING

[Maximum marks: 100]

(Time: 3 Hours)

[Note:- 1. Use of Steam tables and mollier chart are permitted
2. Missing data if any can be assumed suitably.]

PART – A

Maximum marks : 10

I (Answer ***all*** the questions in one or two sentences. Each question carries 2 marks)

1. Define fuel.
2. Classify mechanical or artificial boiler draughts.
3. List the functions or objects of a steam condenser.
4. Define Jet propulsion.
5. Classify nuclear reactions.

(5 x 2 = 10)

PART – B

Maximum marks : 30

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

1. Define Higher calorific value and Lower calorific value of fuel.
2. List out the different classifications of steam condensers.
3. Compare gas turbines with steam turbines.
4. Distinguish between nuclear fission and fusion.
5. A fuel consists of Carbon 85%, Hydrogen 12.5%, residual matter 2.5% by mass.
Find the HCV and LCV per kg of fuel.
6. Draw a Down flow two pass surface condenser and mark the details.
7. Draw the Flow diagram and T-s diagrams of a closed cycle gas turbine.

(5 x 6= 30)

PART – C

Maximum marks : 60

(Answer one full question from each unit. Each full question carries 15 marks)

UNIT –I

III. (a) Explain with a suitable sketch, the working of a Bomb calorimeter.

(9)

(b) List the advantages of steam turbine over steam engine. (6)

OR

IV.(a) Explain the working of De-Laval turbine with suitable figure. (9)

(b) Draw the diagram of a Tandem type compound steam engine. (6)

UNIT-II

V. (a) Calculate the vacuum efficiency from the following data. Vacuum at steam inlet to condenser = 700mm of Hg, Barometer reading = 760mm of Hg, Hot well temperature = 34°C . (9)

(b) Draw and mark the components of a condensing type steam power plant. (6)

OR

VI.(a) Draw the Schematic, $p - v$ and $T - s$ diagrams and explain the processes of Carnot cycle with steam as working substance. (9)

(b) A steam power plant working on Carnot cycle is supplied with dry saturated steam at a pressure of 16 bar and exhausts at 0.2 bar. Calculate Carnot efficiency of the plant using steam tables. (6)

UNIT-III

VII. (a) Draw the lay-out and list the advantages of a Diesel power plant. (9)

(b) List the applications and limitations of gas turbine. (6)

OR

VIII.(a) Explain the working of a Turbo-jet engine with a suitable sketch. (9)

(b) Explain Rocket propulsion with a simple figure. (6)

UNIT-IV

IX. (a) Explain the working of a Pressurized Water Reactor (PWR) with sketch. (9)

(b) Sketch a neat figure of a Bio gas plant. (6)

OR

X. (a) Draw a Nuclear reactor and explain the principal components. (9)

(b) Sketch a neat figure of a Horizontal wind mill. (6)
