

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/
COMMERCIAL PRACTICE, NOVEMBER - 2023**

POWER PLANT ENGINEERING

[Maximum marks: 100]

[Time: 3 Hours]

PART – A

Maximum marks: 10

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

1. Define octane number and cetane number.
2. What is an economizer?
3. What is bleeding of turbines?
4. Define vacuum efficiency of condensers.
5. Describe the role of moderators in nuclear power plants. Name two moderators.

(5 x 2 = 10)

PART – B

Maximum marks: 30

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

1. List the requirements of a good fuel.
2. Why is compounding done in turbines?
3. With the help of a neat sketch explain the working of a forced draft tube cooling tower.
4. Explain the working of a hydroelectric power plant.
5. Compare open and closed cycle gas turbines.
6. List the advantages and disadvantages of a nuclear power plant.
7. Describe the working of a vertical axis wind mill.

(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 the working of a Bomb calorimeter with a neat sketch. (8)
- (b) Explain velocity compounding in turbines. (7)

OR

- IV. (a) Describe the working of a De-Laval impulse turbine. (8)
(b) Explain the factors affecting combustion. (7)

UNIT-II

- V. (a) A surface condenser is designed to handle 12000kg of steam per hour. The steam enters at 0.075 bar abs. and .95 dryness and the condensate leaves at the corresponding saturation temperature. The pressure is constant throughout the condenser. Estimate the cooling water flow rate per hour, if the temperature rise of cooling water is 12C. Take specific heat of cooling water as 4.2 KJ/KgK. (8)
(b) Explain Rankine cycle with P-V and T-s diagram. (7)

OR

- VI. (a) Determine the thermal efficiency of a Carnot cycle operating at a boiler pressure of 12 bar abs. and condenser pressure of 0.1 bar abs. Steam is dry and saturated at 12 bar. (8)
(b) With the help of a neat sketch, explain the working of a parallel flow jet condenser. (7)

UNIT-III

- VII. (a) Explain the working of a diesel power plant with neat sketch. (8)
(b) Describe the working of a constant volume gas turbine. (7)

OR

- VIII. (a) Explain the working of a Ram jet engine. (8)
(b) Outline the advantages and disadvantages of jet propulsion system. (7)

UNIT-IV

- IX. (a) Describe the working of a tidal power plant. (8)
(b) Explain the major parts of a typical nuclear reactor. (7)

OR

- X. (a) Explain the working of a boiling water reactor turbine. (8)
(b) Describe the working of a bio gas digester with a neat sketch. (7)
