DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2018

POWER PLANT ENGINEERING

[*Time* : 3 hours

(Maximum marks : 100)

[*Note* : – Use of steam table and mollier chart are permitted.]

PART — A

(Maximum marks : 10)

Marks

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

1. Define pour point of liquid.

2. What is turbine bleeding ?

3. List out the functions of steam condenser.

4. List out the fuels used in gas turbines.

5. Name the fuel materials used in nuclear power plant.   (5×2 = 10)

PART — B

(Maximum marks : 30)

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

1. Explain working of barometric jet condenser.

2. Distinguish between nuclear fusion and fission.

3. Explain the working of Parson's reaction turbine with sketches.

4. List the requirements of a good fuel.

5. Classify steam condenser.

6. Explain the constant pressure open gas turbine.

7. Illustrate the working of solar grain drier.   (5×6 = 30)

PART — C

(Maximum marks : 60)

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

Marks

UNIT — I

III (a) Explain with a sketch Junkers gas calorimeter to determine the calorific value of gaseous fuel.   8

  (b) List out the merits and demerits of liquid fuels over solid fuels.   7

OR

IV (a) Calculate the higher calorific value and lower calorific value of a coal specimen from the following data Mass of coal burnt = 1g, Quantity of water in calorimeter = 2.5kg, Increase in temperature of water = 2.6°C, Water equivalent of apparatus = 390g, Hydrogen content in fuel is 6% and Cw = 4.2kj/kgk.   8

  (b) Compare between forced and induced drought.   7

UNIT — II

V (a) Illustrate the line diagram of a condensing steam power plant.   8

  (b) Calculate the vacuum efficiency from the following data. Vacuum at steam inlet to condenser = 700 mm of Hg, Barometer reading = 760 mm of Hg, Hot well temperature = 30°C.   7

OR

VI (a) Draw the schematic diagram of steam power plant operating in Carnot cycle and explain various process.   8

  (b) The inlet and outlet temperatures of cooling water to a condenser are 29°C and 36°C respectively. If the vacuum in the condenser is 705 mm of Hg with barometer reading 760 mm, find the condenser efficiency.   7

UNIT — III

VII (a) With the aid of sketch explain the working of a hydroelectric power plant.   8

  (b) State the application of gas turbine.   7

OR

VIII (a) Sketch the flow diagram and T-S diagram. Explain the working of constant pressure gas turbine closed loop.   8

  (b) Explain the working of Ram jet engine.   7

UNIT — IV

IX (a) List the various types of nuclear reactors and explain the main products of a reactor. 8

  (b) Describe the working of a Biogas plant with diagram.   7

OR

X (a) Explain the working of a horizontal windmill with a sketch.   8

  (b) Draw a Nuclear power plant, name its main parts.   7