

THIRD SEMESTER DIPLOMA EXAMINATION IN ELECTRICAL AND
ELECTRONICS ENGINEERING—OCTOBER, 2014

MECHANICAL ENGINEERING

[Time : 3 hours

(Maximum marks : 100)

Marks

PART—A

(Maximum marks : 10)

I Answer the following questions in one or two sentences. Each question carries two marks.

1. What is meant by gauge pressure ?
2. Discuss an orifice meter.
3. What is a nozzle ?
4. Define steam boiler.
5. Discuss the slip in reciprocating pump.

(5×2=10)

PART—B

(Maximum marks : 30)

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

1. Explain the U tube differential manometer.
2. Differentiate between laminar flow and turbulent flow.
3. Write the limitations of Bernoulli's theorem.
4. Explain the hydraulic gradient and total energy lines.
5. Write the essential features of a good steam boiler.
6. Discuss the function of casing in centrifugal pump and name the types of casing.
7. What is an air vessel, how it works ?

(5×6=30)

PART—C
(Maximum marks : 60)

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

UNIT—I

- III (a) Explain the total pressure acting on a surface immersed in a liquid. 7
 (b) A differential manometer containing mercury is used to measure the difference of pressure in two pipes at the same level containing water. The level of mercury in the left limb is 1.8m below the centre of the pipe. Find the difference of pressures in the pipes, if the manometer reads 1.2m. 8

OR

- IV (a) Differentiate steady flow and unsteady flow. 7
 (b) Find the total pressure on a circular plate 2.5m diameter, which is vertically immersed in water, so that its centre is 4m below the water surface. 8

UNIT—II

- V (a) Define : 7
 (i) Critical velocity (ii) Syphon pipe.
 (b) Calculate the discharge through a pipe of 150 mm diameter when the difference of pressure head between the ends of a pipe 500m apart is 6m of water. Take $f = 0.008$. 8

OR

- VI (a) Explain Reynolds number. What information does it give ? 7
 (b) A horizontal pipe of 250mm diameter has its central portion enlarged to 500mm. If the discharge through the pipe is 15000 litres/minute. Determine the loss of head due to sudden contraction and sudden enlargement. 8

UNIT—III

- VII (a) Write the advantages of steam turbines. 7
 (b) Explain with a neat sketch the working of simple vertical boiler. 8

OR

- VIII (a) How will you classify steam boilers ? Explain. 7
 (b) Explain the main components of a Parson's reaction steam turbine. 8

UNIT—IV

- IX (a) Differentiate between impulse turbine and reaction turbine. 7
 (b) Explain the working of Jet pump with sketch. 8

OR

- X (a) A single acting reciprocating pump has a plunger diameter of 300mm and stroke of 200mm. If the speed of the pump is 30 rpm and it delivers 6.5 litres/second of water. Find the coefficient of discharge and percentage of slip of the pump. 7
 (b) Explain the governing mechanism of impulse turbine. 8