THIRD SEMESTER DIPLOMA EXAMINATION IN ELECTRICAL AND ELECTRONICS ENGINEERING — MARCH, 2016

MECHANICAL ENGINEERING

[*Time* : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

I Answer the following questions in one or two sentences. Each question carries 2 marks.

1. Define fluid.

2. State Laminar flow.

3. Distinguish between lower critical velocity and higher critical velocity.

4. Define steam turbine.

5. Explain specific speed of a turbine.   (5×2=10)

PART — B

(Maximum marks : 30)

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

1. Give an expression for finding the pressure difference between two points in the same pipe line which lies horizontally.

2. A square plate having side 4m. immersed in water, such that it makes 45° inclined with free surface. One of its sides is 1.5m. below and which is parallel to water surface. Find total pressure on the plate surface.

3. Describe the limitations of Bernoulli's theorem.

4. Explain water hammer and its effects.

5. Compare between water tube boiler and fire tube boiler.

6. Describe Draft tube and list its functions.

7. Explain the working of lift pump with a neat sketch.   (5×6=30)

2

MarksMarks

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 neat sketch, working of vertical tube micro manometer. 8

(b) A simple manometer connected to a pipeline in which the mercury level in the open tube is 60mm. higher than that on the left limb. If the height of water in the left limb is 50mm. Determine the pressure in the pipe in terms of kPa. 7

Or

IV (a) Define the following.
    (i) Uniform flow   (iii) Turbulent flow
    (ii) Stream line flow   (iv) Steady flow. 8

(b) A circular plate of 1m. is immersed in water, in such a way that its plane makes an angle of 30° with the horizontal and its edge is 1.25m. below the water surface. Determine the total pressure on the plate surface. 7

Unit—II

V (a) Give the expressions for Darcy's formula and Chezy's formula, and give the meaning of notations used in it. 8

(b) A venturimeter with a 150mm. diameter at inlet and 100mm. at throat is laid with its axis horizontal and is used for measuring the flow of oil of specific gravity 0.9. The oil mercury differential manometer shows a gauge difference of 200mm. Assume coefficient of the meter as 0.98. Calculate the discharge in liters/minute. 7

Or

VI (a) Explain hydraulic gradient line and total energy line. 8

(b) A pipe of 75mm. diameter and 250 meters long has a nozzle of 25mm. fitted at the discharge end. If the total head of water is 60m. Find the maximum power transmitted, take 'f' as 0.01 for the pipe. 7

Unit—III

VII (a) Give the classifications of steam turbine. 8

(b) Describe the La-Mont boiler with a neat sketch. 7

Or

VIII (a) List the classifications of steam boilers. 8

(b) Explain with a neat sketch, working principle of steam turbine. 7

Unit—IV

IX (a) With the help of a neat sketch, explain the working of Pelton wheel. 8

(b) Explain with a neat sketch, working principle of single acting reciprocating pump. 7

Or

X (a) Describe the working of Kaplan turbine with a neat sketch. 8

(b) Explain the different types of casings used in centrifugal pump. 7