THIRD SEMESTER DIPLOMA EXAMINATION IN ELECTRICAL AND ELECTRONICS ENGINEERING — OCTOBER, 2015

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. State differential pressure.

2. Define datum head.

3. Give an expression for Reynold's number and its use.

4. Explain steam generator.

5. Explain 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. A differential manometer connected at the two points A and B at the same level in a pipe line containing oil of specific gravity 0.8 and shows a difference in mercury level as 80mm. Determine the difference in pressure at the two points.

2. Derive an expression for finding total pressure on an inclined surface.

3. Give the constructional details of Venturimeter and the functions of each part.

4. A pipe 250m long and 75mm diameter has a nozzle fitted at the discharge end. Find the diameter of the nozzle, so that maximum power may be transmitted. Take f = 0.01.

5. Explain with a neat sketch, working of simple vertical boiler.

6. Classify the water turbine on the basis of available head with examples.

7. Explain the function of air vessel fitted in reciprocating pump.   (5×6=30)

[314]

Marks

PART— C

(Maximum marks : 60)

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

UNIT—I

III (a) Describe the method of measuring pressure, using Piezometer tube. 7

(b) An inverted differential manometer having an oil of specific gravity 0.75 was connected to two different pipes carrying water under pressure as shown in figure. Determine the pressure in the pipe B in terms of kPa., if the manometer reads as shown in figure. Take pressure in the pipe A as 1.5m.
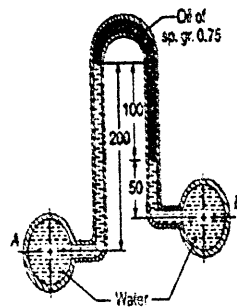
8

OR

IV (a) List a sketch different types of manometer. 7

(b) Find the intensity of pressure at bottom edge of a rectangle plate 2m. wide and 2.5m. deep immersed vertically in water, such that is centre is 2.0m. deep from the water surface. Also find the total pressure on the plate. 8

UNIT—II

V (a) Explain the energies of liquid in motion. 7

(b) Two pipes are connected parallel to each other between two reservoirs with length I_1 = 2400m., diameter d_1 = 1.2m., Darcy's coefficient f_1 = 0.006 for pipe A and I_2 = 2400m., d_2 = 1.0m. and f_2 = 0.005m. for pipe B. Find the total flow, if the difference in elevation is 20m. 8

OR

VI (a) State the major losses and miner losses in pipe lines. 7

(b) A jet of water issues from an orifice of diameter 20mm. under ahead of 2.0m. Calculate the actual discharge in litters per minute. Take C_d = 0.65. 8

Marks

UNIT—III

VII (a) List the classification of steam boilers.   7

    (b) Explain with a neat sketch, working principle of steam turbine.   8

OR

VIII (a) Give the classifications of steam turbine.   7

    (b) Describe the La-Mont boiler with a neat sketch.   8

UNIT—IV

IX (a) Explain the working of inward flow and outward flow reaction turbine with required sketches.   7

    (b) Explain with a neat sketch, working principle of double acting reciprocating pump.   8

OR

X (a) Explain speed control of Impulse turbine with required sketch.   7

    (b) Describe the working of propeller pump with a neat sketch.   8