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(REVISION — 2010)

Reg. No. .....

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THIRD SEMESTER DIPLOMA EXAMINATION IN ELECTRICAL AND ELECTRONICS ENGINEERING — MARCH, 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. What is meant by absolute pressure ?
2. Define total head of a liquid in motion.
3. What is a nozzle ?
4. Define steam turbine.
5. Discuss 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. Explain the different types of manometers.
2. Differentiate laminar flow and turbulent flow.
3. State and explain Bernoulli's theorem.
4. Explain the phenomenon of water hammer.
5. Write the essential features of a good steam boiler.
6. Discuss the different efficiencies of an impulse turbine.
7. What is a centrifugal pump on what principle does it works ? (5×6=30)

Marks

PART—C

(Maximum marks : 60)

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

UNIT—I

III (a) Explain the total pressure on an immersed surface. 7

(b) A differential manometer containing mercury is used to measure the difference of pressure in two pipes A and B containing water. The centre of the pipe B is 0.2m lower than the centre of A. The level of mercury in the left limb is 1.8m below the centre of the pipe A. Find the difference of pressures in the pipes, if the manometer reads 0.8m. 8

OR

IV (a) Differentiate uniform flow and non uniform flow. 7

(b) Find the total pressure on rectangular plate 2m wide and 4m deep vertically immersed in water, in such way that 2m side is parallel to the water surface and 3m below it. 8

UNIT—II

V (a) Sketch and explain the venturimeter for the measurement of discharge. 7

(b) A pipe 500m long is conveying water with a velocity of 1m/s. Find the suitable diameter of the pipe, if the loss head due to friction is 3.4m. Take f = 0.01. 8

OR

VI (a) Write the Darcy-Weisbach equation and explain the terms. 7

(b) A venturimeter with 150mm diameter at inlet and 100mm at throat is laid with its axis horizontal and is used for the measuring flow of oil of specific gravity 0.9. The oil-mercury differential manometer shows a gauge difference of 200mm. Assume the coefficient of the meter as 0.98. Calculate the discharge in litres per minute. 8

UNIT—III

VII (a) What are the differentiating features between a fire tube and a water tube boiler ? 7

(b) Explain with a neat sketch the working of La-Mont boiler. 8

OR

VIII (a) Write the features to be considered while selecting a steam boiler. 7

(b) Explain the classification of steam turbines. 8

UNIT—IV

IX (a) Explain the main components of a reaction turbine. 7

(b) Describe the working of Pelton wheel with sketch. 8

OR

X (a) Explain the different types of casings for the impeller of a centrifugal pump. 7

(b) Sketch and explain the working of kaplan turbine. 8

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