

TED (10)-3056

(REVISION-2010)

Reg. No.

Signature

THIRD SEMESTER DIPLOMA EXAMINATION IN ELECTRICAL AND
ELECTRONICS ENGINEERING—OCTOBER, 2012

MECHANICAL ENGINEERING

[Time : 3 hours

(Maximum marks : 100)

PART—A

Marks

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

1. Identify the use of pitot tube.
2. Define total pressure on an immersed body.
3. Write the reason for water hammer.
4. List any four mountings of a boiler.
5. Define slip of a pump.

(5×2=10)

PART—B

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

1. The intensity at a point in a fluid is given by 49 kN/m^2 . Find the corresponding height of fluid when it is :

- (i) Water (ii) an oil of sp.gravity 0.8

2. Distinguish between :

- (i) Laminar and turbulent flow (ii) Steady and unsteady flow.

3. State and explain Bernoulli's theorem.

4. A nozzle is fitted at the end of a pipe of length 300 m and diameter 100 mm. For the maximum transmission of power through the nozzle, find the diameter of nozzle. Take $f = 0.009$.

5. State the function of an economiser. List its advantages.

6. Classify different types of hydraulic turbines.

7. Describe the function of multistage centrifugal pump.

(5×6=30)

PART—C

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

UNIT—I

- III (a) List the different methods of measuring fluid pressure. Explain the use of inverted U tube differential manometer. 7
- (b) A manometer is fitted to a pipe line containing an oil of specific gravity 0.8. The centre of the pipe line is at a height of 20 cm from the free surface of mercury in the right limb of the U tube and the deflection of mercury is 8 cm in the right limb. Determine the pressure of oil in the pipe line :
 (i) Pascal (ii) m of oil. 8

OR

- IV (a) Discuss the total pressure acting on a horizontal and vertical surface immersed in liquid. 7
- (b) Determine the gauge pressure and absolute pressure at a point 4 m below the free surface of a liquid of specific gravity 1.2, if the atmospheric pressure is 760 mm of Hg. 8

UNIT—II

- V (a) Discuss the condition of flow through parallel pipes and branched pipes. 8
- (b) Find the head lost due to friction in a pipe of diameter 200 mm and 300 mm long through which water is flowing with a velocity of 5 m/s using :
 (i) Darcy's formula
 (ii) Chezy's formula. Take $f = 0.0078$ and $C = 50$. 7

OR

- VI (a) Discuss the limitation of Bernoulli's theorem. 6
- (b) A horizontal venturimeter with inlet diameter 20 cm and throat diameter 10 cm is used to measure the flow of oil of sp. gravity 0.8. The discharge of oil through venturimeter is 60 lit/s. Find the deflection of mercury in the U tube. 9

UNIT—III

- VII (a) With simple sketch, explain the working of reaction steam turbine. 7
- (b) Write short notes on :
 (i) Steam trap (ii) Steam separator 8

OR

- VIII (a) State the function of feed pump and injector. 6
- (b) With a neat sketch describe the working of Lamont boiler. 9

UNIT—IV

- IX (a) Explain the main parts of a centrifugal pump with a neat sketch. 9
- (b) State the necessity of governing of water turbines. 6

OR

- X (a) A single acting reciprocating pump has a bore of 150 mm and stroke 300 mm, delivers 300 lit/minute at 60 rpm. Determine the slip of the pump. 6
- (b) Describe the working of kaplan turbine with a neat sketch. 9