

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/  
MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 2019**

**MECHANICAL ENGINEERING**

[Time : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

I Answer *all* questions in one or two sentences. Each question carries 2 marks.

1. State absolute pressure.
2. State Bernoulli's theorem.
3. What is a steam generator ?
4. Define specific speed.
5. Describe priming.

(5×2 = 10)

PART — B

(Maximum marks : 30)

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

1. Explain pressure measurement with a piezometer.
2. Define datum head, pressure head and velocity head.
3. List any six minor loss of head in pipe flow.
4. Advantages of steam turbines over steam engines.
5. Explain the working of a two stroke petrol engine.
6. Describe the working of Francis turbine.
7. Compare reciprocating pump and centrifugal pump.

(5×6 = 30)

## PART — C

(Maximum marks : 60)

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

## UNIT — I

- III (a) A differential manometer containing mercury is used to measure pressure difference in two pipes A and B. Pipe A contains liquid with specific gravity 0.8 and B contains liquid with 0.9 specific gravity. Pipe A is 200 mm below the level of pipe B. If the liquid column in pipe A is 200 mm and in pipe B is 500 mm, calculate the pressure difference in pipes. 8
- (b) Explain liquid pressure head. 7

OR

- IV (a) Explain streamline and turbulent, steady and unsteady fluid flow. 8
- (b) Convert an intensity of pressure 39.23 kPa of kerosene into the corresponding pressure head in terms of (i) kerosene and (ii) in water. Relative density of kerosene is 0.8. 7

## UNIT — II

- V (a) Describe the discharge measuring by a venturi meter. 8
- (b) A pipe of 60 m long and 150 mm in diameter is connected to a water tank at one end and flows freely into the atmosphere at the other end. The height of water level in the tank is 2.6 m above the centre of the pipe. The pipe is horizontal and  $f = 0.01$ . Determine the discharge through the pipe in litres/s, if all the minor losses are to be considered. 7

OR

- VI (a) What are the methods to measure primary head losses due to friction ? 8
- (b) A venturimeter with inlet diameter 150mm and throat diameter 80 mm is laid its axis horizontal and is used to measure the flow of water. The mercury manometer shows a gauge difference measure as 150 mm. Assume the coefficient of meter as 0.95. Calculate discharge in litres/s. 7

## UNIT — III

- VII (a) Sketch and explain a water tube boiler. 8
- (b) Compare two stroke and four stroke engines. 7

OR

- VIII (a) Classify steam boilers. 8
- (b) Explain four stroke diesel engine. 7

## UNIT — IV

- IX (a) Classify water turbines and the selection of turbine according to the water head. 8
- (b) Explain the working of a centrifugal pump. 7

OR

- X (a) Write short notes on (i) water power (ii) break power (iii) overall efficiency. 8
- (b) Describe the selection criteria of water pump. 7