TED (15) – 3034

(REVISION — 2015)

Reg. No..

Signature ....

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 2018

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.   Define gauge pressure.

2.   Define Total energy line.

3.   Specify the use of an inverted Utube differential manometer.

4.   State the function of a steam generator.

5.   What is the use of an airlift pump ?   (5×2 = 10)

PART — B

(Maximum marks : 30)

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

1.   Illustrate the working of a differential manometer.

2.   Define (i) Laminar flow (ii) Turbulent flow (iii) Steady flow.

3.   State Bernoullis theorem. Point out its limitations.

4.   What is a steam boiler ? How are they classified ?

5.   Compare petrol engines and diesel engines.

6.   Define : (i) Water power   (ii) Brake power and
           (iii) Overall efficiency of water turbines.

7.   List out the classification of water turbines.   (5×6 = 30)

[143]

PART — C

(Maximum marks : 60)

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

UNIT — I

III (a) A pressure gauge fitted to the delivery pipe of a centrifugal pump reads 68 kPa. Find the absolute pressure of water pumped assuming atmospheric pressure as 10.3 m of water. 6

(b) A simple manometer is used to measure the pressure of oil of specific gravity 0.8 flowing in a pipe line. Its right limb is open to the atmosphere and left limb is connected to the pipe. The centre of the pipe is 60mm below the level of mercury in the right limb. If the difference of mercury level in the two limbs is 120mm, determine the pressure of oil in the pipe. 9

OR

IV (a) How can pressure be measured using a piezometer ? What are its limitations ? 6

(b) A U tube mercury manometer is connected to two pipes A and B as shown in fig. The specific gravity of liquid n the pipe A and B are 1.6 and 0.85 resp. Find the pressure difference between two pipes, if the difference in mercury levels in both limbs is 140mm.

9
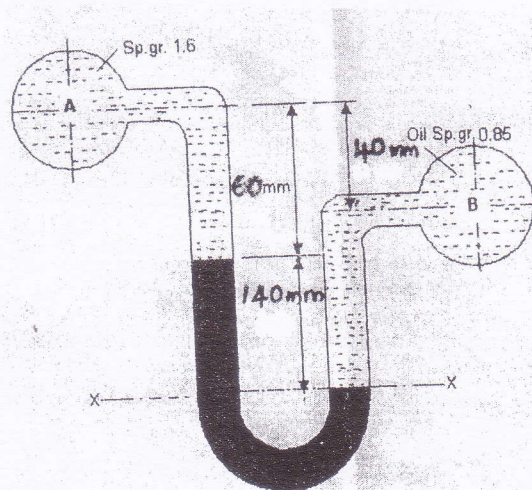
UNIT — II

V (a) Illustrate the construction of a venturimeter. 6

(b) Find the diameter of the pipe of length 2200 m when the rate of flow of water through the pipe is 180 litres/sec and head loss due to friction is 4m.
Take f = 0.006 in Darcy's equation. 9

OR

VI (a) Write short notes on different kinds of energy possessed by a flowing liquid.   6

(b) An oil of specific gravity 0.8 is flowing through a venturimeter having inlet dia 20 cm and throat dia 10 cm. The oil-mercury differential manometer shows a reading of 25 cm. Calculate the discharge of oil through the horizontal venturimeter. Take Cd = 0.98.   9

UNIT — III

VII (a) List the advantages of a steam turbine over steam engines.   6

(b) Explain the working of a four stroke petrol engine with neat sketches.   9

OR

VIII (a) Compare fire tube and water tube boilers.   6

(b) Illustrate the working of a two stroke diesel engine.   9

UNIT — IV

IX (a) Compare impulse and reaction turbines.   6

(b) Describe with neat sketch the working of a pelton wheel turbine.   9

OR

X (a) How is the choice of turbines done based on specific speed.   6

(b) Illustrate the working of a centrifugal pump.   9

———————