TED (10)–3037

(REVISION—2010)

Reg. No. ....

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THIRD SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/ TECHNOLOGY—OCTOBER, 2013

FLUID MECHANICS AND PNEUMATICS

(Common for ME and TD)

[*Time* : 3 hours

(Maximum marks : 100)

Marks

PART—A

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

1.   Distinguish between density and specific weight.

2.   Define buoyancy.

3.   Name hydraulic coefficients.

4.   Define specific speed of a pump.

5.   What are actuators ?

(5×2=10)

PART—B

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

1.   State and explain Pascal's law.

2.   Explain the working principle of a dead weight pressure gauge with neat sketch.

3.   Arrive at an expression for the rate of flow or discharge of a fluid flowing per second through a section of a pipe or channel.

4.   Explain hydraulic gradient and total energy line.

5.   Explain the working principle of a gear wheel pump with the help of a neat sketch.

6.   Describe briefly the criteria for selection of an air compressor for a particular use.

7.   Compare any five merits and de-merits of a hydraulic system and a pneumatic system.

(5×6=30)

PART—C

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

UNIT – I

III (a) Explain the properties viscosity and kinematic viscosity of a liquid and mention their units in S.I. system.

6

   (b) Explain total pressure and centre of pressure and the methods for finding out the total pressure and centre of pressure.

9

OR

[312]

[P.T.O.

IV (a) Differentiate between absolute, gauge, atmospheric and vacuum pressures.   6

    (b) A simple U-tube manometer containing mercury is connected to a pipe in which a fluid of specific gravity 0.8 and having vacuum pressure is flowing. The other end of the manometer is open to atmosphere. Find the vacuum pressure in the pipe, if the difference of mercury levels in the two limbs is 40 cm and the height of the fluid in the left limb from the centre of the pipe is 15cm below.   9

Unit – II

V (a) Give the classifications of orifices.   6

    (b) Find the discharge over a triangular notch of angle 60° when the head over the notch is 0.3m. Assume C_d = 0.6.   9

Or

VI (a) State and explain chezy's formula to find out the loss of head due to friction in a pipe line.   6

    (b) Find the diameter of a pipe of length 2000 m when the rate of flow of water through the pipe is 200 litres/sec and the head lost due to friction is 4m. Take the value of C = 50 in Chezy's formula.   9

Unit – III

VII (a) Briefly describe a Vane pump with the help of a simple sketch.   6

    (b) With the help of a neat sketch, describe the working of a hydraulic accumulator.   9

Or

VIII (a) Name any five pressure control devices for controlling precisely the level of pressure in a hydraulic system.   5

    (b) Draw a neat circuit diagram of an automatic cylinder reciprocating system.   10

Unit – IV

IX (a) Name the essential equipments to be considered in the generation and preparation of air for industrial purpose.   6

    (b) What is an actuator ? Name the classifications of a pneumatic actuator.   6

    (c) Differentiate between poppet valve and slide valve.   3

Or

X (a) Briefly explain an air-over oil circuit with a neat circuit diagram.   6

    (b) Describe a reciprocating piston type air compressor with the help of a neat and simple sketch.   9