TED (15) – 3022 Reg. No.....

(REVISION — 2015) Signature .....

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

FLUID MECHANICS AND PNEUMATICS

[*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 specific gravity of a fluid.
2. Define meta centre.
3. What is meant by lubricity of a hydraulic fluid ?
4. What is the purpose of a notch ?
5. What is meant by electro-pneumatics ? (5×2 = 10)

PART — B

(Maximum marks : 30)

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

1. What are the various types of fluids ?
2. Differentiate pressure and pressure head.
3. Explain the following types of flow.
   (i) Compressible and incompressible flow.
   (ii) Rotational and irrotational flow.
4. Explain the use of a Pitot tube with a sketch.
5. State and explain each term in the Chezy's equation.
6. Explain the working of a gear pump.
7. Explain duplex type of air cylinder. (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) A differential manometer is used to measure the difference of pressure of oil of specific gravity 0.8 contained in two pipes at the same level. If the difference of the manometric liquid level, which is mercury is 100mm. Determine the difference of pressure of oil in the two pipes. 8

(b) Explain the working of a Bourden tube pressure gauge. 7

OR

IV (a) Calculate the specific weight, specific mass and specific gravity of a liquid having a Volume of $6m^3$ and a weight of 44kN. 8

(b) A rectangular tank 5m long and 2m wide contains water to a depth of 2m. Calculate the total pressure force at the base of the tank. 7

UNIT — II

V (a) Explain the different energies possessed by a flowing liquid. 8

(b) Find the discharge over a triangular notch of angle 60° when the head over the notch is 0.25m. Assume $C_d = 0.6$. 7

OR

VI (a) Explain the hydraulic co-efficients and deduce its relationship. 8

(b) A pipe of 250mm diameter is suddenly reduced to 150mm diameter. If the discharge of water through the pipe is 25litre/s, calculate the head lost due to sudden contraction. 7

UNIT — III

VII (a) Explain the important functions of control valves. 8

(b) Explain gear type of hydraulic motor. 7

OR

VIII (a) Explain a simple ball type 2/2 poppet valve. 8

(b) Explain the working of a bladder type of accumulator. 7

UNIT — IV

IX (a) What are the various applications of air cylinder in a pneumatic circuit ? 8

(b) State the various applications of hydro-pneumatic system. 7

OR

X (a) Explain an air-oil reservoir used in a hydro-pneumatic system. 8

(b) Explain a double end type of air cylinder. 7