

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2017

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 Newton's law of viscosity.
2. State Pascal's Law.
3. Define Vena-contracta.
4. List various types of Pumps.
5. Sketch the symbol of Pneumatic 4/2 DC Valve.

(5×2 = 10)

PART — B

(Maximum marks : 30)

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

1. Discuss the types of fluid.
2. A ship floating in sea water displaces 108 m^3 of water. Determine the weight of the ship, if sea water has a specific gravity of 1.1.
3. Describe about the energy losses in Pipes.
4. Derive the Continuity Equation.
5. Briefly explain the working of Hydraulic Gear Pump.
6. Interpret the accumulator and intensifier.
7. Briefly explain the working of Pneumatic cylinder.

(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) Calculate Specific Weight, Mass Density, Weight of one Litre of Petrol having Specific Gravity 0.7. 6
- (b) A U-tube 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. The deflection of mercury is 8 cm in the right limb. Determine the pressure of oil in the pipe line. 9

OR

- IV (a) Estimate the gauge pressure and absolute pressure at a point 4 m below the free surface of a liquid of specific gravity 1.53, if atmospheric pressure is equivalent to 760 mm of mercury. 6
- (b) A circular plate 4m in Dia is immersed in Sea water having sp. Gravity 1.01 such that its circular surface makes an angle of 30 degrees with the free surface and its top edge is 1.2m below it. Find the total pressure. 9

UNIT — II

- V (a) State the assumptions of Bernoulli's Theorem. 6
- (b) A horizontal venturimeter 150×75 mm is used to measure flow rate of water. Determine the deflection of mercury in the U tube manometer, if the flow rate is 35 lit/s. Take $C_d=0.96$ 9

OR

- VI (a) Explain the purpose of Notches and its classification. 6
- (b) Water flows through a pipe line 20cm in diameter and 400m long, the mean velocity of flow is 3 m/s. Determine the head lost due to friction (i) Using Darcy's formula and (ii) Using Chezy's formula. Take $f = 0.01416$ and $C= 37$. 9

UNIT — III

- VII (a) Describe about Fluid power and its applications. 6
- (b) Draw the cross section of a pilot operated check valve and describe. 9

OR

- VIII (a) Explain with sketch the Diaphragm type gas accumulator. 6
- (b) Draw the circuit diagram of Hydraulic robotic arm and explain. 9

UNIT — IV

- IX (a) Illustrate Pneumatic Tandem Cylinder and its applications. 6
- (b) Draw automatic cylinder reciprocating circuit diagram and mark the components. 9

OR

- X (a) Prioritise electro pneumatic system. 6
- (b) Draw the circuit diagram of sequencing of two cylinders by electro pneumatic system. 9