TED (15/19) – 3022
(Revision – 2015/19)

A23 -07933

Reg.No……..
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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE , APRIL – 2023

FLUID MECHANICS AND PNEUMATICS

(Maximum Marks : 100) (Time : 3 hours)

PART – A
(Maximum Marks : 10)

Marks

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

1. Define metacenter.
2. Write the application of an Inverted U tube differential manometer.
3. List any two classification of minor losses.
4. Define Flash point.
5. Write the Functions of FRL unit.

(5x2=10)

PART – B
(Maximum Marks : 30)

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

1. State Newton's law of viscosity. Define kinematic viscosity.
2. A balloon filled with hydrogen has a volume 500 cm^3 at atmospheric pressure. Calculate the final volume if it is dipped in a water body to a depth of 100 meter. The bulk modulus of elasticity is 3.75x10^ 9 N/m^2.
3. Calculate discharge of water flowing over a rectangular notch of 2m length when constant head over the notch is 400mm. Take Cd as 0.6.
4. Explain water hammer.
5. List the properties an ideal hydraulic fluid should posses.
6. With the help of a neat diagram, explain the working of solenoid control valve.
7. List the advantages of hydro-pneumatic system.

(5x6=30)

PART – C
(Maximum Marks : 60)
(Answer **one full** question from each unit. Each full question carries 15 marks)

UNIT – I

III. (a) Explain absolute pressure, atmospheric pressure, gauge-pressure and vacuum pressure.(8)

(b) A U-tube differential manometer containing mercury is connected to pipe A containing liquid of specific gravity 1.6 at a pressure of 120 Kpa and on the other side to a pipe B containing oil of Specific gravity 0.8 under a pressure of 200 Kpa. The pipe A lies 2.5 m above pipe B and mercury level in limb connected to pipe A lies 4 m below the pipe A. Determine difference in levels of mercury in the two limbs of manometer. (7)

OR

IV. (a) Define mass density, specific weight, specific gravity and specific volume. (8)

(b) A triangular plate of base width 2 m and height 3 m lies immersed vertically in water with its apex downwards. The base of plate is 1 m below and parallel to free water surface. Calculate the total pressure on one side the plate. (7)

UNIT – II

V. (a) State Bernoulli's theorem and list limitations. (8)

(b) A horizontal venturimeter with inlet diameter and throat diameters 300mm and 150mm is used to measure discharge of water. The reading of differential manometer(Cd=0.95) connected to the throat and inlet is 200 mm of mercury. Determine the rate of flow. (7)

OR

VI. (a) Explain hydraulic coefficients of an orifice. (8)

(b) Water is flowing through a pipe of 250 mm in diameter and 150 m long with a velocity of 3m/s. Find the head loss due to friction using Darcy's formula and Chezy's formula. Assume f = 0.05 and C = 55. (7)

UNIT –III

VII. (a) With neat diagram, explain the components of a hydraulic system. (8)

(b) Describe Bladder type accumulator. (7)

OR

VIII. (a) With a neat diagram, explain hydraulic intensifier. (8)

(b) Explain working of an external gear pump. (7)

UNIT – IV

IX. (a) With a neat diagram, explain basic pneumatic system. (8)

(b) Illustrate an air lubricator. (7)

OR

X. (a) Compare pneumatic and hydraulic system. (8)

(b) Illustrate an air fliter. (7)

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