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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE, NOVEMBER-2020

FLUID MECHANICS AND PNEUMATICS

[Maximum marks: 75] (Time: 2.15 Hours)

PART – A

(Answer any ***three*** questions in one or two sentences. Each question carries 2 marks)

I. (1). Differentiate between Ideal Fluid and real Fluid.

(2). What are the assumptions made in Bernoulli's Theorem.

(3). List any four advantages of Fluid power.

(4). List any four applications of air cylinders.

(5). Differentiate between absolute pressure and gauge pressure. (3 x 2 = 6)

PART – B

(Answer any ***four*** of the following questions. Each question carries 6 marks)

II. (1). Explain the conditions for equilibrium of a floating body.

(2). Explain the differences between orifice and a Notch.

(3). List out the minor losses of head in a long pipe.

(4). Explain the principle of working of a weight loaded accumulator.

(5). Explain the principle of working of a positive displacement pump with the help of a figure.

(6). Draw the pneumatic circuit for controlling double acting air cylinder.

(7). List the advantages and applications of a hydro pneumatic system. (4 x 6= 24)

PART – C

(Answer ***any of the three units*** from the following. Each question carries 15 marks)

UNIT –I

III. (a). Define the following terms.

(i). Specific Volume. (ii). Kinematic Viscosity.

(iii). Specific gravity. (iv). Compressibility. (8)

(b). T tank with length 4m and breadth 6m contains 2.5m deep oil with specific gravity 0.9 find.

(i). Intensity of pressure at the base of the tank.

(ii). Total Pressure on the base of the tank. (7)

OR

IV. (a). A simple U tube manometer containing mercury is used to measure the pressure of oil with specific gravity 0.8 flowing in a pipeline. Its right limb is open to atmosphere and left limb is connected to pipe. The centre of the pipe is 90mm below the level of mercury (specific gravity 13.6) in the right limb. If the difference of mercury levels in the two limbs is 150mm, find the pressure of oil in the pipe. (8)

(b). Explain features of a bourdon tube pressure gauge with the help of a figure. (7)

UNIT-II

V. (a). Explain the principle of working of a venturimeter with the help of a sketch. (8)

(b). A pipe 60 meters long and 150mm in diameter is connected to a water tank at one end and flows freely into the atmosphere at the other end. Height of water level in the tank is 2.6 meters above the centre of the pipe. Pipe is horizontal and $f = 0.01$. Determine the discharge through the pipe in litres per second, if all minor losses are to be considered. (7)

OR

VI. (a). List the advantages of triangular notch over rectangular notch. (8)

(b). A venturimeter with a 150mm diameter at inlet and 100mm at throat is laid with its axis horizontal and is used for measuring the flow of oil with specific gravity 0.9. The oil – mercury differential manometer shows a gauge difference of 200mm. Coefficient of discharge of venturimeter is 0.98. Calculate the discharge in litres per minute. (7)

UNIT-III

VII. (a). Explain the basic components of a hydraulic system with the help of a diagram. (8)

(b). Explain the principle of a hydraulic Intensifier with a figure. (7)

OR

VIII.(a). List the functions of control valves in a hydraulic system. (8)

(b). Explain the principle of working of a gear pump. (7)

UNIT-IV

IX. (a).Explain the principle of working of an Air lubricator with the help of a diagram. (8)

(b). Compare the characteristics of a hydraulic and pneumatic system. (7)

OR

X. (a). Draw the pneumatic circuit for a pneumatic chuck and explain it's working. (8)

(b). Explain a solenoid operated valve with the help of a diagram. (7)