

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

**FLUID MECHANICS AND MACHINERY**

(Maximum Marks :75)

[Time : 2.15 hours]

**PART-A**

Marks

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

1. Define kinematic viscosity.
2. State Pascal's law.
3. Define suction head and delivery head of a centrifugal pump.
4. What is priming of a pump.
5. Define fire point of a fluid.

(3x2=6)

**PART - B**

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

1. Explain the capillarity of fluids.
2. What are the limitations of Bernoulli's theorem.
3. List the advantages of triangular notch over rectangular notch.
4. Explain water hammer.
5. Explain the working of a centrifugal pump.
6. List the different types of air cylinders.
7. Explain the working of a poppet valve.

[4x6 =24]

**PART - C**

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

**UNIT I**

**III** (a) Explain the working of a Bourdon's tube pressure gauge with a sketch. (6)

- (b) A simple manometer containing mercury is connected to a pipe in which a liquid of sp.gravity 0.8 is flowing. The right limb is open to atmosphere. The difference of mercury level in both limbs is 150mm. The level of mercury in the right limb is 90mm above the centre of the pipe. Find the pressure of oil in the pipe. (9)

**OR**

- IV** (a) Distinguish between atmospheric pressure, gauge pressure and vacuum pressure. (6)
- (b) Determine the total pressure on a circular plate of diameter 2 m which is placed vertically in water in such a way that the centre of the plate is 4m below the free surface of water. (9)

**UNIT- II**

- V** (a) What are the assumptions in Bernoulli's theorem. (6)
- (b) A horizontal Venturimeter is provided in a pipeline 150mm diameter carrying water. The differential monometer gives a reading of 150mm of mercury. The throat diameter is 80mm. Find the discharge. Assume coefficient of discharge as 0.95. (9)

**OR**

- VI** (a) Explain how Chezy's formula can be used for finding the head loss due to friction in pipes. (6)
- (b) A pipe carries oil of specific gravity 0.8 flows with a velocity of 3.5 m/s at section of 300 mm diameter. At another section of the same pipe, the diameter is 250 mm. Find the velocity and mass flow rate of oil at this section. (9)

**UNIT- III**

- VII** (a) Explain with a sketch the working of single acting reciprocating pumps. (6)
- (b) A centrifugal pump is required to lift  $0.05\text{m}^3/\text{s}$  of water from a well of depth 40m. If rating of the pump motor is 32kW. Find the overall efficiency of the pump. (9)

**OR**

- VIII** (a) Explain the functions served by air vessels in a reciprocating pump. (6)
- (b) Explain the different types of impeller casings of centrifugal pumps. (9)

**UNIT – IV**

- IX** (a) Explain the different properties of hydraulic fluids. (6)
- (b) Describe the working of a double acting air cylinder with a sketch. (9)

**OR**

- X** (a) Explain any six advantages of pneumatic power system. (6)
- (b) Explain the working of a pneumatic system with simple diagram. (9)

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