

FMHM Sample question

4th sem

Mechanical

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long type (~~5 mark~~  
8 mark)

- ① With a neat sketch explain the working of a centrifugal pump
- ② Write different types of fluid pressure measuring instrument explain the function of differential manometer with sketch
- ③ Describe different type of manometers
- ④ What is orifice meter? Derive an expression through an orifice meter.
- ⑤ Differentiate between a reciprocating pump & centrifugal pump
- ⑥ A volume of  $2.5 \text{ m}^3$  of certain fluid weight  $9.81 \text{ kN}$ . Determine specific weight, mass density, & specific gravity of the liquid.
- ⑦ A venturimeter having diameter of  $100 \text{ mm}$  at the throat &  $175 \text{ mm}$  at the enlarged end is installed in a horizontal pipeline of  $175 \text{ mm}$  in dia carrying in oil of sp. gravity  $0.95$ . The difference of pressure head is  $180 \text{ mm}$  of Hg. Determine the discharge through pipe line if  $C_d = 0.97$

8 Draw the layout of a hydro-electric power plant & mention its features.

9 Derive expression for the force of jet on a fixed plate.

10 State & prove continuity equation for one dimensional flow.

### Questions containing (5) marks

1 Explain the working principle of reciprocating pump with neat sketches.

2 Derive Bernoulli's equation & state some practical application.

3 Derive an equation for the total pressure on a vertical immersed surface.

4 Explain the concept of buoyancy & flotation.

5 Convert intensity of pressure of 20 kPa into equivalent pressure head of oil of sp. gravity 0.9.

6 Explain hydraulic gradient & total gradient line.

7 Explain relation between  $C_d$ ,  $C_v$  &  $C_c$ .

8 Explain different types of fluid flow.

9 Classification of notches & weirs.

10 Explain Pascal's Law.



## Question concerning Water

- ① Define Specific gravity
- ② state 'Archimedes' principle
- ③ what is difference between laminar & turbulent flow
- ④ state Darcy's formula for loss of head in pipe
- ⑤ Define jet of water
- ⑥ What is function of venturimeter?
- ⑦ Define metacentre
- ⑧ Define Density
- ⑨ Mention different losses in flow through pipe
- ⑩ Define uniform flow