

N26-108

December-2014

B.Sc., (Fire & Safety) Sem.-III

HYDRAULICS & PUMPS

Time : 3 Hours]

[Max. Marks : 70

1. (a) Explain briefly the working principle of “Bourdon tube pressure gauge” with a neat sketch. 7

OR

Explain types of pressure. With the help of pressure relation diagram.

- (b) A pitot-static tube placed in the centre of a 300 mm pipe line has one orifice pointing upstream and other perpendicular to it. The mean velocity in the pipe is 0.80 of the central velocity. Find the discharge through the pipe if the pressure difference between the two orifices is 60 mm of water. Take the co-efficient of pitot tube as $C_v = 0.98$. 7

OR

What is a venturimeter ? Derive an expression for the discharge through a venturimeter.

2. (a) With a neat sketch, explain the principle and working of a centrifugal pump. 7

OR

What is priming ? Why is it necessary ?

- (b) Explain with neat sketch the function of main components of reciprocating pump. 7

OR

What is NPSH ? State its importance.

3. (a) Explain the term “pipes in parallel”. 7

OR

Find the loss of head when a pipe of diameter 200 mm is suddenly enlarged to a diameter of 400 mm. The rate of flow of water through the pipe is 250 litres/s.

- (b) Explain various types of valve. 7

OR

Explain with neat sketch “Minor energy losses”.

4. (a) Write short note on “Hydraulic coupling”. 7

OR

Explain with neat sketch, the working of “Air lift pump”.

- (b) Find the force exerted by a jet of water of diameter 75 mm on a stationary flat plate, when the jet strikes the plate normally with velocity of 20 m/s. 7

OR

Explain with neat sketch, the working of “Jet pump”.

5. (1) Define “Impact of jet”. 14
- (2) Give the use of “Pitot tube”.
- (3) Define “pump”.
- (4) Define “Vacuum pressure”.
- (5) Define “C Factor”.
- (6) Give the use of “Hydraulic torque converter”.
- (7) Define “Steady flow”.
- (8) Poise is the unit of
- | | |
|------------------|--------------------------|
| (i) Mass density | (ii) Kinematic viscosity |
| (iii) Viscosity | (iv) Velocity gradient |
- (9) Bernoulli’s theorem deals with the law of conservation of
- | | |
|--------------|------------------------|
| (i) Pressure | (ii) Momentum |
| (iii) Energy | (iv) None of the above |
- (10) Study of fluid at rest is known as
- | | |
|----------------|------------------------|
| (i) Kinematics | (ii) Dynamics |
| (iii) Statics | (iv) None of the above |
- (11) A hot wire anemometer is a device used for measuring
- | | |
|---------------|----------------|
| (i) Velocity | (ii) Viscosity |
| (iii) Current | (iv) Pressure |
- (12) Flow of a fluid in a pipe takes place from
- | |
|--|
| (i) Higher level to lower level |
| (ii) Higher pressure to lower pressure |
| (iii) Higher energy to lower energy |
| (iv) None of the above |
- (13) Give the use of “Pipe”.
- (14) Define “Cavitations”.
-