

(d) Convert the pressure of 0.8 N/mm^2 in meters of liquid of specific gravity 0.75.

3. Solve any **THREE** of the following :

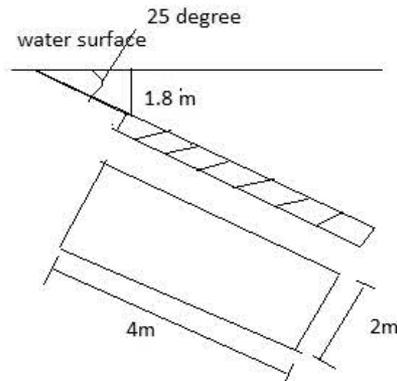
[12]

(a) A tank contain water for a height of 0.5 m and an immiscible liquid of Specific gravity 0.8 above the water for height of 1 m find the resultant pressure per meter length of tank.

(b) A horizontal pipe carrying water tapers from 20 m diameter at A to 10 cm diameter at B in a length of 2 m. The pressure at A is 100 N/cm^2 . If the discharge is 600 lit/min calculate pressure at B in N/cm^2 . If the loss of head from A to B is 10 cm.

(c) Describe with neat sketch working of Venturimeter.

(d) Calculate total pressure and center of pressure for a rectangular plate 2m wide and 4 m deep which is immersed in water such that its plane makes an angle 25° with water surface.



4. Attempt any **THREE** of the following:

[12]

(a) Calculate the discharge through rectangular channel of width 8 m having bed slope 1 in 1000. Depth of water in channel is 5 m. (Take Chezy's constant $C = 50$)

(b) Differentiate between Centrifugal and Reciprocating pump (Any four points.)

(c) A centrifugal pump is required to pump 10 lit/sec against a head of 40 m. Find the power required by the pump if efficiency of pump is 70%.

(d) Differentiate between Laminar & turbulent flow.

(e) Explain with neat sketch working of single acting reciprocating pump.

5. Solve any **TWO** of the following :

[12]

(a) Calculate loss of head and direction of flow for a pipe 300 m long having slope 1 in 200. It tapers from 1.2 m diameter or higher end to

0.6 m diameter at lower end. Discharge of water flowing through pipe is 900 lit/sec. Pressure at higher end is 7 N/cm^2 & lower end is 11 N/cm^2 .

- (b) Calculate discharge through pipe line having length 50 m and it is connected to a reservoir. The head above inlet is 8 m and pipeline discharges freely at other end. The diameter of first 25 m length is 15 cm and for remaining length is 30 cm. Consider all losses $(f) = 0.04$
- (c) Calculate discharge and pressure difference between entrance and throat for Venturimeter of size $30 \times 15 \text{ cm}$ if it is provided in a Vertical pipeline carrying oil of specific gravity 0.9, the flow being upwards. The difference in elevation of throat section and entrance of Venturimeter is 50 cm the differential U tube mercury manometer show a gauge deflection of 30 cm.

6. Solve any **TWO** of the following :

[12]

- (a) Explain working of centrifugal pump
- (b) Design a trapezoidal most economical channel section having side slope of $2V : 3H$. It discharge water at rate of 20 cumec with bed slope $1 : 2000$ (Take Manning's constant 0.01)
- (c) Explain advantages of triangular notch over rectangular notch and calculate discharge over triangular notch of angle 60° when the head over the notch is 20 cm. (Take $c_d = 0.625$)

