

418

October 2023

Time – Three hours
(Maximum Marks: 100)

- [N.B. 1. Answer all questions under Part-A. Each question carries 3 marks.
2. Answer all the questions either (A) or (B) in Part-B. Each question carries 14 marks.]

PART – A

1. Define capillarity.
2. Define centre of pressure and depth of centre of pressure.
3. Write short notes on orifice meter.
4. List out minor losses in flow through pipes.
5. Compare 'V' notch and rectangular notch.
6. Define velocity of approach.
7. Write short notes on losses in channels.
8. Write short notes on LDPE lining.
9. Define slip, Percentage of slip and Co-efficient of discharge.
10. Write a short note on Plunger pump.

PART – B

11. (a) A simple U-tube manometer is used to find the pressure at a point A of kerosene of relative density 0.8 flowing through a pipe. The deflection of mercury in the U-tube between the limbs was 0.10m and the free surface of mercury in the open limb was 0.05 m above A. Find the pressure at A in terms of pascals.

(Or)

- (b) A circular plate, 3m diameter is immersed in a liquid of relative density 0.9. Its peripheral distances are 2m and 4m from the free surface of the liquid. Compute (a) total resultant thrust on the plate and (b) position of its application from the free liquid surface.

12. (a) The discharge through a vertical water pipe, 100 mm diameter at top and 200mm diameter at bottom is 78.54 lps. If the length of the pipe is 1m, find (a) the velocity at top (b) the velocity at bottom and (c) the pressure difference.

(Or)

- (b) A drowned orifice, 1m wide has levels of water from the bottom and top edges of the orifice as 2.25m and 2 m, respectively, in the supply tank. If the difference in water levels on both the sides of the orifice is 0.375 m and $C_d = 0.62$, find the discharge.

13. (a) A triangular notch is discharging under a head of 0.7m at an angle of 60° . If the coefficient of discharge of the notch is 0.60, find the discharge.

(Or)

- (b) Explain the classification of weirs.

14. (a) An economical rectangular channel discharges $15 \text{ m}^3/\text{s}$ with a velocity of 1.60 m/s. Taking Chezy's constant as 60, find, (a) depth of flow, (b) bed width and (c) bed fall.

(Or)

- (b) Explain the methods of measurement of velocity in channels.

15. (a) Explain the working of reciprocating pump with neat sketch.

(Or)

- (b) A centrifugal pump is required to lift water against a total head of 40 m at the rate of 50 lit/sec. Find the power required to drive the pump, if the overall efficiency is 62%.
