

963**April 2018*****Time - Three hours
(Maximum Marks: 75)***

***[N.B: (1) Q.No. 8 in PART - A and Q.No. 16 in PART - B are compulsory.
Answer any FOUR questions from the remaining in each PART - A
and PART - B***

(2) Answer division (a) or division (b) of each question in PART - C.

***(3) Each question carries 2 marks in PART - A, 3 marks in Part - B and
10 marks in PART - C.]***

PART - A

1. Define: (i) Cohesion (ii) Adhesion.
2. Write the three types of hydraulic energies.
3. Distinguish between weir and notch.
4. What is meant by most economical section?
5. Specify the test for finding the yield of a well.
6. Mention any three pressure measuring devices.
7. State the law of conservation of mass.
8. Compare 'V' notch and rectangular notch.

PART - B

9. What are the practical applications of resultant pressure?
10. Explain three hydraulics coefficients.
11. What is Cippoletti weir?
12. Define: (i) Wetted perimeter (ii) Wetted area (iii) Hydraulic radius.
13. What are the advantages of jet pump?
14. Name the types of channel losses.
15. List out the precautions to be taken while operating a centrifugal pump.
16. Write the Darcy's and Chezy's formula to find the major loss.

[Turn over.....

PART - C

17. (a) A U-tube manometer containing mercury was used to measure the negative pressure in the pipe. The right limb was open to the atmosphere. Find the vacuum pressure in the pipe, if the difference of mercury level in the two limbs was 100mm and the height of water in the left limb from the centre of the pipe was found to be 40mm below.

(Or)

- (b) Determine the total pressure and the depth of centre of pressure on an isosceles triangular plate of base 3m and altitude 3.5m when it is immersed vertically in an oil of specific gravity 1.25. The base of the plate coincides with the free surface of the oil.
18. (a) Water flows through a circular orifice 2.5cm diameter, under a constant head 72cm above the centre of orifice. For a point in the issuing jet, the horizontal and vertical co-ordinate are 28cm and 3cm respectively when measured from the venacontracta. The actual discharge is 1.5lps. Calculate the hydraulic coefficients.

(Or)

- (b) A horizontal venturimeter with inlet diameter 160mm and throat diameter 80mm is used to measure flow of oil of relative density 0.8. Determine the deflection of oil mercury manometer if the discharge of the oil is 50lps. The co-efficient of the meter is 0.98.
19. (a) Find the discharge through a trapezoidal notch which is 1.2m wide at the top and 0.5m at the bottom and is 0.4m height. The head of water on the notch is 0.3m. Assume C_d for rectangular portion=0.62, while for the triangular portion=0.60.

(Or)

- (b) A 30m long weir is divided into 10 equal bays by vertical posts each 0.3m wide. Using Francis's formula, calculate the discharge over the weir under an effective head of 1m.
20. (a) Design an economical rectangular channel to carry $90\text{m}^3/\text{s}$ with a bed fall of 1 in 1500. Take Chezy's constant $C=50$.

(Or)

- (b) An economical trapezoidal channel has a bed width of 4m and side slope of 1:1 has a bed fall of 1 in 1600. Taking $C=60$, find the discharge.
21. (a) (i) Draw the characteristic curves of a centrifugal pump.
(ii) Write the methods of rainwater harvesting.

(Or)

- (b) Write the construction details, working of a reciprocating pump with neat sketch.
