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Register No.:

October 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 intensity of pressure.
2. State the various types of fluid flow.
3. State the Bernoulli's theorem.
4. What is Cippoletti weir?
5. Define the term hydraulic mean depth.
6. What are the various methods of tapping ground water?
7. Define specific yield of a well.
8. Write down the standard value of atmospheric pressure.

PART – B

9. Differentiate between cohesion and adhesion.
10. What is an orifice? How are orifices classified?
11. Define co efficient of discharge and co efficient of contraction.
12. Differentiate between notch and weir.
13. What are the conditions for an economical rectangular channel section?
14. What are the advantages of lining of canals?
15. What is the absolute pressure in kN/m^2 when the vacuum pressure at a point is 220 mm of mercury?
16. What do you mean by slip in reciprocating pumps?

PART – C

17. (a) A simple manometer is used to measure the pressure of oil of relative density 0.75 flowing in a pipe line. Its right limb is open to the atmosphere and the left limb is connected to the pipe. The centre of pipe is 0.10 m below the level mercury in the right limb. If the difference of mercury levels in the two limbs is 0.20 m, determine the absolute pressure of the oil in the pipe in N/m^2.

(Or)

(b) A circular plate of 2 m diameter is immersed in an oil of relative density 0.80. Its maximum and minimum depths are 2 m and 1 m respectively from free surface of oil. Determine: (i) The total pressure on one side of the plate and (ii) The depth of centre of pressure.

18. (a) A Venturimeter with a 150mm diameter inlet and 100mm diameter throat is laid with its axis horizontal. It is used for measuring the flow of oil of relative density 0.80. The oil-mercury differential manometer shows a deflection of 0.20m. Assume the coefficient of the meter as 0.98. Calculate: (i) Venturihead, and (ii) Discharge in lpm.

(Or)

(b) Water flows through a 150mm diameter and 50m long pipe with a velocity of 2.5m/s. Find the loss of head due to friction, by using (i) Darcy's formula, taking friction factor as 0.02, and (ii) Chezy's formula, taking Chezy's constant as 60.

19. (a) A trapezoidal notch is 1.5 m wide at the top and 0.75 m at the bed. The height is 0.45m. Determine the discharge through the notch when the head of water is 0.30 m. Take C_d as 0.60.

(Or)

(b) A submerged weir is 3 m long. The heads of water on the upstream and downstream sides of the weir are 0.50 m and 0.25 m respectively. If C_d=0.60, estimate the discharge over the weir.

20. (a) A rectangular channel has an economical section. The maximum discharge through the channel is 74.60 m^3/sec. The bed fall is 1 in 1600. Find the dimensions of the channel. Take C=50.

(Or)

(b) An economical trapezoidal channel section has a bed width of 4 m and side slopes of 1:1. It has a bed fall of 1 in 1600. Taking C as 60, find the discharge.

21. (a) Explain briefly about the various methods of rain water harvesting.

(Or)

(b) A single acting reciprocating pump running at 50rpm, delivers 0.01 m^3/sec of water. The diameter of the piston is 0.20 m and stroke length is 0.40 m. Determine (i) theoretical discharge of the pump (ii) coefficient of discharge (iii)slip, and (iv) percentage slip of the pump.
