

4th SEM,

CIVIL ENGINEERING

HYDRAULICS & IRRIGATION
ENGR

Important Question

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2 Marks :-

1. Define hydraulic Machine?
2. Find the surface tension in a soap bubble of 35.70 mm diameter when the inside pressure is 2.75 N/m^2 above atmospheric pressure?
3. Write the Empirical formulae for the value of Chezy's constant?
4. Difference between Centre of gravity & Centre of buoyancy?
5. Write the assumptions made in the derivation of Bernoulli's equation?
6. State the conditions of most economical rectangular channel?
7. What do you mean by Steady & unsteady flow?
8. What do you mean by uniform & non uniform flow?
9. What do you mean by Laminar & turbulent flow?
10. Explain each term in Bernoulli's equation?
11. Write down the relationship between specific weight & density of a liquid?
12. State the expression for Centre of Pressure for vertical plane immersed surface?

13. Write the dimension & unit of viscosity?
14. What is Reynold's number?
15. Write the formula for discharge over a V-notch explaining each term?
16. Define slip of reciprocating pump?
17. For an orifice C_d is 0.65 & C_v is 0.97 find C_c ?
18. Differentiate between absolute pressure & gauge pressure?
19. What do you mean by venturi meter? write its discharge formula?
20. Distinguish between a notch & weir?
21. Write down the head loss in pipe in sudden enlargement & contraction?
22. What do you mean by slip of pump?
23. What do you mean by hydrology cycle?
24. What are the necessity of irrigation?
25. What is crop season?
26. Write down the relationship between Duty, Delta & Base period?
27. What is Overlap allowance?
28. State Gross command area & culturable command area?
29. What is intensity of irrigation?
30. What is crop ratio?

31. What is perennial evaporation?

32. What is siltation & scouring?

5 MARKS!

1. Calculate the specific weight, density & specific gravity of 2.5 litre of a liquid which weighs 15 N?
2. Find the velocity of flow of an oil through pipe, when the difference of mercury level in a differential U-tube manometer connected to two tapping pipes of a Pitot tube is 175 mm. Take the coefficient of Pitot tube is 0.97 & specific gravity of oil = 0.98
3. Draw the sketches of centrifugal pump & reciprocating pump, to show the main parts of the respective pumps?
4. Find the loss of head when a pipe diameter is 1200 mm is suddenly enlarged to 5350 mm. Take rate of flow of water through the pipe is 260 litres/sec.
5. The head of water over a rectangular notch is 970 mm. The discharge is 320 litres. Find the length of the notch, when $C_d = 0.68$?
6. A differential manometer connected at two points A & B at the same level in a pipe containing an oil of sp. gravity 0.85 shows a difference in mercury level as 110 mm. Find the difference of pressure at A & B?

7. What is the total pressure on a circular plate of diameter 3 meter, when it is immersed vertically in water, so that its top most point is a depth of 2 meter from water surface?
8. A trapezoidal channel has side slope 1 horizontal to 2 vertical & slope of the bed is 1 in 2500. The area of section is 40 m^2 . Find the dimension of most economical section & its discharge. Take $C = 65$?
9. A weir 20m long is divided into 8 equal bays by vertical posts each 40cm wide. Determine the discharge over the weir if the head over the crest is 1.1m & velocity of approach is 1.8 m/sec?
10. State Bernoulli's theorem. Mention its limitations & application.
11. What do you mean by water logging? Write down its causes & effect.
12. What are the methods by which we can prevent soil erosion?
13. Briefly explain the advantages & disadvantages of irrigation.
14. Show the different parts of a weir with a neat sketch.
15. Define percolation. Explain its effect & remedies.

16. Show the different parts of a barrage with a neat sketch?

17. What are the different ways by which an earth dam can fail?

10 Marks!

1. Why irrigation necessary in India?
2. What are the factors affecting duty?
3. Explain Hydrological cycle with a neat sketch?
4. Define the terms - Weir, under sluices, guide bank, head work?
5. Give a neat layout of a head work?
6. Discuss the component parts of a weir & their function?
7. How are canals classified based on the carrying capacity?
8. What are Canal lining? what are its advantages?
9. Explain Super Passage, Aqueduct?
10. State & prove Bernoulli's equation, what are its limitations?

11. With the help of neat sketch explain the working of a single acting reciprocating pump.
12. What are the advantages of triangular notch over rectangular notch?
13. A rectangular channel 2m wide carries a maximum discharge of 300 lit/sec & a minimum of 150 lit/sec. It discharges through a 120° angle notch. At what level from the channel bed, if the notch be placed to give the maximum depth of 1m for the channel? What is the maximum depth of water in the channel? Assume 0.6 for discharge coefficient. Neglect velocity of approach?
14. Explain major energy losses & minor energy losses in pipes.
15. A rectangular channel carries water at a rate of 300 lit/sec, when bed slope is 1 in 2000. Find the most economical dimensions of the channel of $C = 65$.
16. The two points A & B on a pipeline has pressure 320 kN/m^2 & 235 kN/m^2 respectively. The point B is 3.5m above the point A. The diameter of pipe is 30cm & velocity is 25 m/sec.

For steady flow determine loss head between A & B ?

17. State the expression for centre of pressure for vertical plane immersed surface ?

18. A square surface $3\text{m} \times 3\text{m}$ lies in a vertical plane. Determine the position of the centre of pressure & the total force on the square when its upper edge is 15m below the water surface ?

19. In a pipe diameter 350mm & length 75m water is flowing at a velocity of 2.8m/sec . Find the head loss due to friction. Using

(i) Darcy-Weisbach Formula

(ii) Chezy's formula for which $c = 55$

Assume kinematic viscosity of water is 0.12 stoke ?

20. The rate of flow of water through a horizontal pipe is $0.25\text{m}^3/\text{sec}$. The diameter of the pipe which is 200mm is suddenly enlarged to 400mm . The pressure intensity in the small pipe is 11.772N/cm^2 . Determine

- (i) Loss of account to sudden enlargement.
(ii) Pressure intensity in the large pipe.