



BLACK DIAMOND SCHOOL OF ENGINEERING

CIVIL ENGINEERING DEPARTMENT

QUESTION BANK

4TH SEMESTER

SUB: IRRIGATION & HYDRAULIC ENGINEERING

Prepared By: Mrs. Tusarika Behera, Sr. Lect

Hydraulics

(4th sem, civil.)



(2 marks question)

- ① (a) Define density?
- (b) Define specific weight of the fluid?
- (c) What is meant by specific volume of a fluid?
- (d) Define specific gravity of a fluid?
- (e) Define viscosity?
- (f) State the Newton's law of viscosity?
- (g) State the unit of viscosity and its unit?
- (h) Define kinematic viscosity and its unit?
- (i) What are the Newtonian fluid?
Give two examples?
- (j) Mention types ~~new~~ of viscosity?

(5 marks questions)

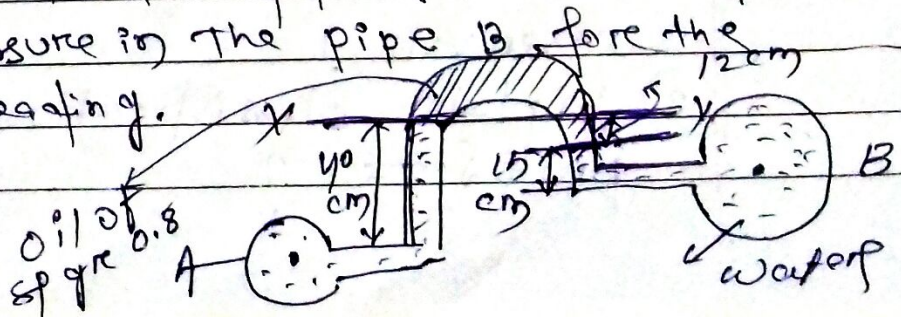
- ① (a) If the surface tension at air-water interface is 0.068 N/m . What is the pressure difference between inside and outside of an air bubble?
- (b) If specific gravity of a liquid is 0.80 , make calculation for its mass density, specific volume and specific weight?
- (c) A liquid having kinematic viscosity 5 stokes and specific gravity 1.8 , determine the dynamic viscosity?
- (d) Find the pressure at a depth of 15 m below the free surface of water in a reservoir?
- (e) Explain classification of fluid pressure?

- (f) Explain different types of flow in a pipe?
- (g) Find the height of water column corresponding to a pressure of 54 kN/m^2 .
- (h) Find the surface tension in a soap bubble of 50 mm diameter when inside pressure is 2.5 N/m^2 above atmosphere.
(10 marks questions)

(1) The right limb of a simple manometer U-tube containing mercury is to open to the atmosphere while the left limb is connected to a pipe in which a fluid of specific gravity 0.9 is flowing. The centre of the pipe is 15 cm below the level of mercury in the right limb. Find out the pressure of fluid in the pipe if the difference of mercury level in the two limbs is 25 cm .

(2) The velocity distribution for flow over a flat plate is given by $U = \frac{4}{5} y - y^2$ in which U is the velocity in meter per sec at a distance y meters above the plate. Determine the shear stress at $y = 0.25 \text{ m}$. Take dynamic viscosity of fluid as 10 poise.

(3) Water is flowing through two differential pipes to which an inverted differential manometer having an oil of specific gravity 0.8 is connected. The pressure head in pipe A is 2 m of water. Find the pressure in the pipe B for the manometer reading.



Investigation Engineering
& Hydraulics
4th sem, civil

- (2 marks question)
- (1) (a) what is meant by rotation of crops?
 - (b) what are alluvial soils?
 - (c) Define Hydrograph & Hyetograph?
 - (d) Define runoff?
 - (e) Write down the formula for flood discharge by Dicken's formula & Ryve's formula.
 - (f) what is the phenomenon of capillarity?
 - (g) what is barometer?
 - (h) Define centre of pressure?
 - (i) Define metacentre?
 - (j) Define metacentric height?

- (5 marks questions)
- (2) (a) A tube well fully penetrates on unconfined aquifer, calculate the discharge of the tube well from the following data
 - (i) Diameter of the well = 15 cm
 - (ii) Draw down = 4 m
 - (iii) Length of tube well of strainer below drawdown = 10 m
 - (iv) coefficient of permeability of aquifer = 6.05 cm/sec
 - (v) radius of circle influence = 200 m

(b) what are the causes of water logging?

(c) what are the advantages and disadvantages of various types of canal lining?

11110111111

(d) What are the components of irrigation canals and their functions?

(e) A body of dimension $2\text{m} \times 1\text{m} \times 3\text{m}$ & weight 3924 N in water. Find its weight in air. What will be its specific gravity?

(f) Determine the total pressure on a circular plate of diameter 3m which is placed vertically in water in such a way that the centre of the plate is 8m below the free surface of water. Find the position of the centre of pressure also?

(g) Classify different types of fluid flow!

(h) What is the difference between rotational flow and irrotational flow?
(10 marks questions)

(i) An isosceles triangular plate of base 3m and altitude 3m is immersed vertically in an oil of specific gravity 0.8 . The base of the plate coincides with the free surface of oil. Determine (i) total pressure on the plate (ii) position of centre pressure

(j) Give a brief explanation about different types of fluid flow?

(k) What are the effects of water logging and its detection?

Irrigation & Hydraulic

4th sem, civil

[2 marks questions]

- 1) (a) what is equation of continuity?
- (b) what are the various energies of fluid?
- (c) what do you mean by total energy of the fluid?
- (d) Define total pressure and centre of pressure?
- (e) what is the meaning of floatation?
- (f) what do you mean by lift irrigation?
- (g) Define co-efficient of permeability?
- (h) Define Aquicludes and Aquifers?
- (i) what do you mean by yield of a well?
- (j) what do you mean by perennial irrigation?

[5 marks questions]

- 2) (a) How are canals classified based on the discharge capacity?
- (b) Write down the comparison between inundation and perennial irrigation?
- (c) Distinguish between Hydraulic gradient and longitudinal gradient?
- (d) Sketch out the different canal cross-section?
- (e) what is centrifugal pump and write down its principle and types?
- (f) Write down the difference between Venturimeter and orificemeter.
- (g) A pitot tube is used to measure the velocity of flow of water in

a pipe. The stagnation pressure head is 10m and static pressure head is 8m. Calculate the velocity of flow assuming the co-efficient of pitot tube $C_v = 0.98$.

② What is the difference between Notch & Weir?

[10 marks questions]

① A rectangular channel 1.5m wide has a discharge of 200 l/sec. which is measured by a right angled V notch weir. Find the position of the apex of the notch from the bed of the channel if the maximum depth of water is not to exceed 1.2m, Assume $C_d = 0.62$.

② State and prove continuity equation for one dimensional flow.

③ Distinguish between with neat sketch between the canal in full cutting and the canal in full banking?

— x —