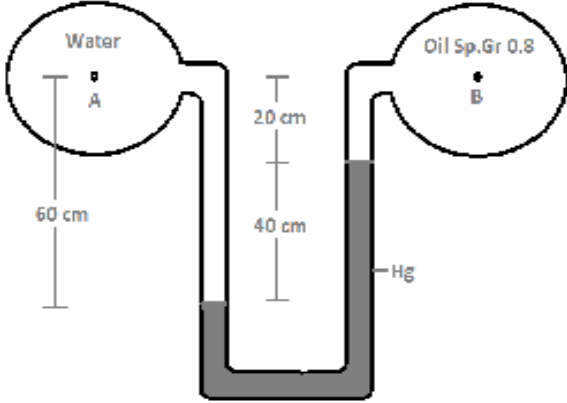# BE Semester-__III __ (CIVIL) Question Bank

(FLUID MECHANICS-I)

All questions carry equal marks(10 marks)

Q-1	State and prove Pascal's Law.
Q-2	Determine pressure at pipe B, if pressure at pipe A is 80 KN/m^2
Q-3	Determine mass density and specific weight of liquid having sp.gravity 1.25.
Q-4	Show that rate of increase of pressure in a vertical direction is equal to specific weight of fluid
Q-5	An open tank contains water up to depth of 0.8m and above it oil of specific gravity0.8 for a depth of 1.2m. Calculate pressure intensity at interface of two liquid and at the bottom of tank
Q-6	State Euler's equation of motion. And derive Bernoulli's equation from it.
Q-7	Velocity for two dimensional flow field is given by $V=(3+2xy+4t^2)\ i+(xy^2+3t)\ j$ Find the velocity and acceleration at a point (1,2) after 2 sec.
Q-8	Show that stream lines and eqipotential lines are always orthogonal
Q-9	Discuss the various types of fluid flow
Q-10	A 200mm× 100 mm venturimeter is provided in vertical pipe carrying water flowing in the upward direction .A differential mercury manometer connected to the inlet and throat gives a reading of 220mm.Find the rate of flow. Assume C_d =0.98
Q-11	Water flows at a rate of 0.015m^3/sec through a 100 mm diameter orifice used in a 200 mm pipe .What is the difference of pressure head between the upstream section and the vena contracta section? Take C_d= 0.6
Q-12	Define the following terms: (1) Mass density (2) Weight density (3) Specific gravity (4)viscosity
Q-13	Discuss various types of fluid
Q-14	Write a short note on : (1) surface tension (2) Capillarity
Q-15	Calculate the capillary rise in a glass tube of 3mm diameter inserted in water

	. Surface tension for water is 0.075N/m. What will be the percentage increase in capillary height if the diameter of glass tube is 2mm.
Q-16	Find the depth of a point below the free surface in a tank containing oil where the pressure intensity is 78.48KN/m^2 (specific gravity of oil = 0.8)
Q-17	Classify various types of manometer
Q-18	A rectangular plane surface is 2 m wide and 4 m deep. It lies vertically plane in water, determine the total pressure and position of centre of pressure on the plane surface when its upper edge id horizontal and coincides with water surface and 2.5m below the free surface.
Q-20	Define the following terms (1) buoyancy (2) centre of buoyancy (3) Meta centre (4) Meta centric height
Q-21	How will you determine metacentric height of a floating body experimentally? Explain with neat sketch
Q-22	A solid wooden cylinder of 3m diameter and 2m height floating in water with its axis vertical .Find the metacentric height of cylinder. Specific gravity of wood=0.6
Q-23	Explain stream line path line streak lines
Q-24	Define continuity equation , Derive an expression of continuity equation for three dimensional flow.
Q-25	What is venturimeter? Derive an expression for the discharge through a venturimeter
Q-26	Discuss relative merits and demerits of venturimeter with respect to orifice meter
Q-27	A diameter of a tapering pipe are 10 cm at one end and 20cm at the other end. If water is entering through 10 cm diameter end with a velocity of 2m/s , find the discharge through pipe. Also find velocity through other end
Q-28	Derive the expression for loss of head due to sudden expansion and sudden contraction
Q-29	Explain TEL and HGL
Q-30	A horizontal pipe 12 cm in diameter is joined by sudden enlargement to a 15 cm diameter pipe. Water is flowing through it at rate of 2 m^3/min. Find the loss of head due to sudden expansion and the pressure difference in the two pipes, If the change of section is gradual without any loss what would be the change in pressure
Q-31	Write a short note on pipe in series
Q-32	Define orifice and mouthpiece . Give classification of orifice and mouth piece

Q-33	Distinguish between
	    (1) External and internal moth piece
	    (2) Fully submerged and partially submerged orifice

Q-34	The head of water over an orifice of diameter 30mm is 9m. Find the actual discharge and actual velocity of the jet at vena contracta. Take C_d=0.62 and C_v= 0.98

Q-35	An internal mouth piece of 100mm diameter is discharging water under a constant head of 10m. find the discharge through mouth piece when
	    (1) Running free
	    (2) Running full

Q-36	What id weir? Give classification weir
Q-37	Derive the expression for discharge over the (a) rectangular notch (2) triangular notch
Q-38	Prove that error in discharge due to the error in the measurement of head over a triangular notch is given by dQ/Q =(5/2) dH/H
Q-39	Water is flowing in a rectangular channel of 1.2m width and 0.80m depth. Find the crest length 50cm if the head of water over the crest of weir .Take Cd=0.62 Neglect end contraction .Take velocity of approach in to consideration.
Q-40	What is pitot tube? How the velocity at any point is determined with the help of pitot tube?