Roll no._____ ID: 180731/170731/120731/030731

Semester: 3rd

Branch: Civil, Brick Tech, Const Mgmt, Highway Engg.

Subject Name: Fluid Mechanics

Time Allowed : 3 Hrs. **MM:100**

Section –A

Note: Multiple Choice questions. All questions are compulsory. 10x1=10

Q.1 Real fluids are (CO_1)
a) Viscous b) Compressible c) Possess surface tension d) All of the above

Q.2 Rain drops are spherical due to (CO_2)
a) Surface tension b) Air resistance c) Viscosity d) Atmospheric pressure

Q.3 The phenomenon of capillarity is due to (CO_2)
a) Cohesion b) Adhesion c) Cohesion and adhesion d) None of the above

Q.4 The specific gravity of water is: (CO_2)
a) 1 b) 0 c) 9.81 d) None of the above

Q.5 Absolute pressure is equal to (CO_4)
a) Gauge pressure + Vacuum b) Gauge pressure + Atmospheric pressure
c) Gauge pressure - Atmospheric pressure d) Atmospheric pressure - Gauge pressure

Q.6 Continuity equation deals with the law of conservation of (CO_5)
a) Mass b) Energy c) Momentum d) None of the above

Q.7 The term $\frac{v2}{2g}$, in Bernoulli's theorem is known as (CO_5)
a) Datum head b) Kinetic head c) Pressure head d) Potential head

Q.8 If the liquid particles move in Zig-Zag way, the flow is (CO_5)
a) Unsteady flow b) Turbulent flow c) Non-uniform flow d) All of the above

Q.9 A current meter is used to pressure (CO_6)
a) Pressure b) Velocity c) Viscosity d) Electric current

Q.10 Laminar flow occurs in pipes when reynold's number (CO_7)
a) Is less than 2000 b) Lies between 2000 to 3000
c) Lies between 3000 to 5000 d) Lies between 5000 to 10000

Section-B

Note: Objective type questions. All questions are compulsory. 10x1=10

Q.11 Define Viscosity. (CO_2)
Q.12 Define capillarity. (CO_2)
Q.13 What is the S.I unit of specific volume? (CO_2)
Q.14 Define manometers. (CO_4)
Q.15 What is the function of peizometer? (CO_4)
Q.16 Define laminar flow. (CO_5)
Q.17 1 litre = _____ m^3. (CO_5)
Q.18 State continuity equation. (CO_5)
Q.19 Define critical velocity. (CO_7)
Q.20 Define water hammer. (CO_7)

Section –C

Note: Short answer type Questions. Attempt any twelve questions out of fifteen questions. 12x5=60

Q.21 State Pascal's law and also write some applications of Pascal's law. (CO_3)
Q.22 A rectangular plate 4m long and 3m wide is placed horizontally in water at a depth of 4m. find the total pressure acting on the top surface of the plate. Take specific weight of water as 9.81 KN/m^3. (CO_3)
Q.23 Explain differential manometer with the help of neat sketch. (CO_4)
Q.24 A simple U-tube manometer containing mercury is connected to a pipe in which a liquid of specific gravity 0.75 and having vacuum pressure is flowing. The other end of the manometer is open to atmosphere. Find the vacuum pressure in pipe, if the difference of

mercury level in the two limbs is 70 cm and centre of pipe is 30 cm above the level of mercury in the left limb. (CO_4)

Q.25 Explain Bernoulli's theorem with its applications. (CO_5)

Q.26 Explain different types of hydraulic energies. (CO_5)

Q.27 Write the functions of a venture meter. (CO_6)

Q.28 Write five differences between notch and weir. (CO_6)

Q.29 Find the discharge through a fully submerged orifice 3m wide and 1.5 m deep, if difference of water level on both the sides of orifice is 3m. Take $C_d = 0.62$. (CO_6)

Q.30 Name the major and minor head losses during flow in pipe. (CO_7)

Q.31 Explain distribution of velocity in a pipe with the help of sketch. (CO_7)

Q.32 Define hydraulic mean depth for a rectangular section. (CO_8)

Q.33 Define wetted perimeter and hydraulic mean depth. (CO_8)

Q.34 A rectangular channel section having hydraulic mean depth 0.9 m discharges water with a velocity of 1m/s. find the value of Chezy's constant, if the bed slope of the channel is 1 in 2000. (CO_8)

Q.35 Write a short note on Centrifugal pumps. (CO_9)

Section-D

Note: Long answer type questions. Attempt any two questions out of three questions. 2x10=20

Q.36 A rectangular plate of size 1.5m x 3m is immersed in water in such a way that its 1.5m side is parallel to the free surface of water and its upper edge is 2m below the free surface of water. Find the total pressure on the plate and the position of centre of pressure. (CO_3)

Q.37 An oil of specific gravity 0.9 is flowing through a pipe of 0.25 m diameter at a rate of 2000 litres/min. Find the type of flow if the viscosity of oil is 3.8 poise. (CO_7)

Q.38 Explain most economical section of a channel. What are the conditions for the trapezoidal channel of the best section? (CO_8)