

DEPARTMENT OF CIVIL ENGINEERING

Assignment to weak student (Session 2020-21)

COURSE: B.Tech

SEMESTER: III

SUBJECT: Fluid Mechanics

CODE: 3CE4-06

Q. 1. Define free and forced vortex flow and Derive expression of forced Vortex flow. Explain total acceleration, convective acceleration, local acceleration, stream line and path line.

Q. 2. Explain rheological classification of fluids (types of fluids) and Regimes of flow based on density and viscosity with one example of each and also draw Rheopectic diagram.

Q. 3. Explain types of pressure with diagram and calculate the work done in blowing a soap bubble of diameter 12 cm. Assume the surface tension of soap solution is 0.014 N/m. Also explain velocity gradient and Newton's law of viscosity with diagram.

Q.4. Explain following with diagram (Attempt Any 3 from i-iv):

- i. Stable and Unstable equilibrium of submerged body .
- ii. Stable and Unstable equilibrium of floating body.
- iii. Centre of pressure, Centre of gravity and Centre of buoyancy
- iv. Explain statement of Pascal's Law and Hydrostatic Law.

Q. 5. The right limb of simple U-tube manometer containing mercury is open to air while left limb is connected to a pipe in which fluid of sp. Gravity 0.9 is flowing. The centre of pipe is 12 cm below the level of mercury in right limb. Find the pressure of fluid in the pipe if the difference of mercury level in 2 limbs is 20 cm.

Q. 6. Derive Euler's equation of motion with diagram. How Bernoulli's equation is obtained by this. State assumptions its also. Describe the types of mouthpieces and Derive expression of actual discharge through Borda's mouthpiece running full.

Q. 7. Derive Darcy-Weisbach equation with diagram, define friction factor. Describe all type minor losses in pipe flow (Name and formula only of each type)