

(Time: 3 Hours)

Total Marks : 80

- N.B. (1) Question No 1 is compulsory  
 (2) Attempt any three questions out of remaining six questions  
 (3) Assumption made, if any should be clearly stated  
 (4) Figures to the right indicate full marks.

- Q1. Explain the following (any four) [20]  
 a. Write short note on surface tension and capillary effect.  
 b. State various pressure measuring devices.  
 c. Explain loss of head due to sudden contraction.  
 d. Explain the major and Minor losses in pipes  
 e. What do you mean by term fluid and give its classification.
- Q2. (a) What is eddy viscosity? Indicate Relation between eddy viscosity and eddy diffusivity of momentum. [10]  
 (b) Two horizontal plate are placed 1.25 cm apart ,the space between them being filled with oil of viscosity 14 Poise. Calculate the shear stress in oil if upper plate is moved with a velocity of 2.5 m/s. [10]
- Q3. (a) Oil of viscosity 0.098 kg/(m.s.)and sp.gr 0.9 flows through a horizontal pipe of 2.5 cm diameter. If the pressure drop per meter length of pipe is 0.12 kgf/cm<sup>2</sup>.Determine (i) The rate of flow.(ii) Reynolds number. (iii) The power required per 50 m length pipe to maintain flow. [10]  
 (b) Draw and explain the propagation of pressure waves, when  $Ma = 1$ ,  $Ma < 1$  and  $Ma > 1$  [10]
- Q4. (a) What is eddy viscosity ? Indicate Relation between eddy viscosity and eddy diffusivity of momentum. [10]  
 (b) Explain and derive expression for Pitot-tube [10]
- Q5. (a) Derive the expression for Vertical single column manometer. [10]  
 (b) Explain the characteristics curve of centrifugal pumps [10]
- Q6 Explain the following terms (any four) [20]  
 a. Explain Pascal's law.  
 b. What is the significance of Mach No.? Also define Mach No  
 c. Derive an expression for hydrostatic equilibrium.  
 d. Write short note on Rota Meter .  
 e. NPSHR and NPSHA.

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