QUESTION PAPER

M.Tech

Sessional-I

Time; 2 Hrs Total marks :30

Part –I: Attempt any four questions. Each question carry 2 marks

Q.1: State three laws obeyed by all fluids.?

Q.2: What are Newtonian Fluids?

Q.3: Give three examples of non-Newtonian fluids.

Q.4: What is Stokes laws?

Q.5: Describe Eulerian and Lagrangian model of fluid flow.

Q.6: What is the difference between the substantial and total derivative.

Q.7: Define divergence of velocity in terms of volume.

Q.8: Define what you mean by conservation of mass. 10

Part-II: A: Attempt any four questions. Each question carries5 marks

Q-1: Prove that divergence of fluid velocity v is given by



where v is the fluid velocity and V is the volume of fluid element.

Q-2: Prove that continuity equation is



where the density of fluid element v is its velocity.

Q-3: Prove that equation in Q-2 is same as



Q-4: State Divergence theorem (Greens Theorem) with example

Q-5: Prove that Equation of continuity in the case of control volume fixed in space is



Q-6: Prove that equation in question 5 is same as



Q-6: Prove that



Q-7: State Stokes laws for normal and tangential stresses.