UIT-RGPV (Autonomous) Bhopal
Department of Petrochemical Engineering

Subject In-charge: Prof. Mehtab Singh Chouhan
Semester: VII
Subject code – PC 702 **Subject: Transport Phenomena**

Assignment no 1 (date:13.09.2021)

Submission date (15.09.2021)

1. Derive the equation continuity in different coordinate system.
2. What are steady state, Laminar flow and turbulent flow?
3. Derive the velocity distribution expression for laminar, incompressible, Newtonian flow of a fluid in circular long pipe, Also derived the exprssion for average velocity.
4. What are the most commonly used boundary conditions? Write the expression of momentum balance equation for steady flow.
5. A horizantal annulus, 27 ft in length, has an inner radus of 0.495 inch and an outer radius of 1.1 inch. A 60 % aqueous solution of sucrose is to be pumped through the annulus at 20^0C. At this temperature the solution density is 80.3 lb/ft^3 and the viscosity is 136.8 lb_m/ft-hr. What is the volume flow rate when the impressed pressure difference is 5.39 psi?