

ME (Chemical) and ME (Chemical)-Env.Engg First Semester

First Periodicals- Fluid Mechanics

Time allowed: 1 Hour

M: M-25

1. Show that for a steady laminar flow between two fixed parallel plates, the velocity distribution across a section is parabolic and that the average velocity is $2/3$ of the maximum velocity. (7)
2. Derive Hagen-Poiseuille's equation for viscous flow through pipe. (6)
3. Derive the Von-Karman integral momentum equation. What are the various assumptions involved? (7)
4. A crude oil of viscosity 0.97 poise and relative density 0.9 is flowing through a horizontal circular pipe of diameter 100mm and of length 10m. Calculate the difference of pressure at the two ends of the pipe, if 100 kg of the oil is collected in a tank in 30 seconds. (5)