

B.E. (Chemical) 3rd semester
Minor Test (16 December 2021)
Subject: Fluid Flow

Time Allowed: 60 minutes

Max. Marks: 25

Note: Attempt all questions. State clearly all your assumptions and boundary conditions. Any missing data may be suitably assumed.

Q1. What is the working principle of centrifugal pump? Explain the terms cavitation and priming encountered in centrifugal pump. CO4 (6)

Q2. I) How repeating variables are selected in Buckingham pi theorem method of dimensionless analysis? (3)

II) The power required by an agitator in a tank is a function of the following variables: a. Diameter of the agitator b. Number of rotations of the impeller per unit time c. Viscosity of liquid d. Density of liquid. From dimensional analysis using Buckingham's method, obtain a relation between power and the four variables.

(III) The power consumption is found experimentally to be proportional to the square of the speed of rotation. By what factor would the power be expected to increase if the impeller diameter was doubled? CO2 (4,3)

Q3. A) What do you mean by compressible flow? Explain subsonic, supersonic flows with respect to Mach number. (3)

B) Explain the variation of pressure ratio with distance from nozzle inlet in context of compressible flow with the help of diagram. (6) CO3