(108)

211/p3/ksl/upq/oct 08kl

S.E. (Chem) (Sem IV) Dec. 08

(107)

Con. 5044-08. RC- 6179

Fluid Flow (3 Hours) 19/12/08 Total Marks : 100

N. B. : (1) Question No. 1 is **compulsory**.
(2) Attempt any **four** questions out of remaining **six** questions.
(3) Assume **suitable** data if **required** and indicate it **clearly**.
(4) Figures to the **right** indicate marks.

1. (a) A crude oil of viscosity 0·9 Poise and specific gravity 0·8 is flowing through a horizontal circular pipe of diameter 80mm and length 15m. Calculate the difference of pressure at the two ends of pipe, if 50 kg of oil is collected in tank in 15 sec.
   (b) Draw the characteristic curves for a centrifugal pump for head, capacity, power and efficiency.

2. (a) Explain power curves for baffled and unbaffled vessel.
   (b) Explain phenomena of fluidization.

3. (a) What is mean by insertion meters ? Give example. Classify the flow measuring devices and write in brief about orificemeter.
   (b) A fluid of viscocity 0·06 Ns/m^2 is flowing between two parallel plates 1m wide and maintained 1·5 cm apart. The velocity of fluid at the centre is 3m/s. The length of each plate is 1·5 m determine the loss of pressure and volumetric flow rate of liquid.

4. (a) Discuss the effect of roughness parameter on friction factor.
   (b) State the application of draft tubes.
   (c) Differentiate between the operating principles of head flow meter and variable area flow meter.

5. (a) Calculate the pressure, temperature and density of air at stagnation point on the nose of the plane, when an aeroplane is flying at 11000 km/hr through still air having a pressure at 7 N/cm^2 and temperature -5°C. Wind velocity may be taken as zero. Take R = 287·14 J/kg° K, K = 1·4.
   (b) An oil of sp. gr. 0·8 is flowing through a venturimeter having inlet diameter 20 cm and throat diameter 10 cm. The oil-mercury differential menometer shows a reading of 25 cm. Calculate the discharge of oil through the horizontal venturimeter (Cd = 0·98).

6. (a) What is fluidization. With neat sketch, explain the different conditions for fluidization.
   (b) Write brief note on converest diverest nozzles.

7. Write short notes on :—
   (a) Helical screw agitator
   (b) Two Phase Flow
   (c) NPSH
   (d) Compressors.