

Seat No.: _____

Enrolment No.: _____

GUJARAT TECHNOLOGICAL UNIVERSITY
DIPLOMA ENGINEERING – SEMESTER – III • EXAMINATION – SUMMER 16

Subject Code: 3330503

Date: 17.05.2016

Subject Name: Fluid Flow Operation

Time: 02:30 PM TO 05:00 PM

Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make Suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Use of programmable & Communication aids are strictly prohibited.**
5. **Use of only simple calculator is permitted in Mathematics.**
6. **English version is authentic.**

- Q.1** Answer any seven out of ten. **14**
1. Define : Static pressure
 2. Define : Gauge pressure
 3. Define : Vacuum
 4. Define : Impact pressure
 5. Define : vena-contracta
 6. Define : Ideal fluid
 7. Define : kinematic viscosity
 8. Define : Steady state flow
 9. Define : Friction factor
 10. Define : Hydraulic radius
- Q.2** (a) Give difference between compressible fluid and incompressible fluid. **03**
- OR
- (a) A differential U-tube manometer is filled with CCl_4 and water, specific gravity 1.6 and 1 respectively. If the liquid above water is kerosene, specific gravity 0.8 and manometer reads 8 cm, find the pressure drop in the units of kg/cm^2 . **03**
- (b) Explain boundary layer. **03**
- OR
- (b) Explain viscosity concept. **03**
- (c) Classify time dependent fluids. **04**
- OR
- (c) Explain Reynold's experiment. **04**
- (d) Derive equation of pressure in static fluid for incompressible fluid. **04**
- OR
- (d) Explain simple U-tube manometer with neat sketch and derive equation for the same. **04**
- Q.3** (a) Give continuity equation with nomenclature. **03**
- OR
- (a) Compare skin and form friction. **03**
- (b) Give Hagen-Poisullies equation with nomenclature. **03**
- OR
- (b) Give assumptions for derivation of Bernoulli Equation. **03**
- (c) Derive Bernoulli Equation. **04**

- OR
- (c) Explain friction loss from sudden expansion of cross section. **04**
- (d) Explain friction factor chart. **04**
- OR
- (d) Draw neat sketch of any four fittings and give their application. **04**
- Q.4** (a) Give classification of flow measuring devices. **03**
- OR
- (a) Give only figure of globe valve. **03**
- (b) Give difference between pipe and tube. **04**
- OR
- (b) Explain characteristic curves of centrifugal pump. **04**
- (c) Derive equation to calculate volumetric flow rate for venturi meter. **07**
- Q.5** (a) Explain rotameter with neat figure. **04**
- (b) Find out discharge coefficient of an orifice meter where diameter of pipe is 5 cm, diameter of orifice is 2.25 cm, flow through pipe is $200 \text{ cm}^3/\text{s}$ and deflection of mercury manometer is 2045 cm. Take density of mercury and water (flowing through pipe) equal to 13600 kg/m^3 and 1000 kg/m^3 respectively. **04**
- (c) Explain pneumatic conveying. **03**
- (d) Give industrial application of fluidization. **03**
