Seat No.: _____

GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-IV(New) EXAMINATION – SUMMER 2016

Subject Code:2141406

Date:06/06/2016

Subject Name:Food Engineering Transport Phenomenon Time:10:30 AM to 01:00 PM Total Marks: 70

Instructions:

- 1. Attempt all questions.
- 2. Make suitable assumptions wherever necessary.
- **3.** Figures to the right indicate full marks.

Q.1 Short Questions

- **1** Define Specific gravity
- 2 Density of mercury is.....kg/m³
- **3** What is surface tension?
- 4 Write unit of viscosity
- 5 Write dimensions of shear stress.
- 6 Draw velocity distribution of viscous fluid in small diameter pipe.
- 7 What is the value of C_d for orifice meter?
- 8 Define rotational flow.
- **9** Define capillarity.
- **10** Center of buoyancy definition.
- **11** Give the range of Reynolds's number for transition flow
- 12 Write dimensions of Reynolds number
- **13** Define compressible flow.
- 14 Define rate of discharge.
- Q.2 (a) Write a short note on : meta centre
 - (b) Derive the continuity equation for three dimensions in rectangular co-ordinates.
 - (c) Give the classification of devices used for pressure measurement. Derive an equation 07 of pressure for vertical single column manometer.

A simple U-tube manometer containing mercury, it is connected to the pipe in which a fluid of specific gravity 0.8 and having vacuum pressure is flowing. The other end of the manometer is open to atmosphere. Find the vacuum pressure in pipe if the difference of mercury level in the two limbs is 40 cm and the height of the fluid in the left limb from the center of pipe is 15 cm below.

OR

- (c) Derive an equation of pressure difference for U-tube differential manometer. 07
- Q.3 (a) Calculate the pressure due to a column of 0.3 m of (a) water (b) an oil of specific 03 gravity 0.8 (c) mercury of specific gravity 13.6.
 - (b) Water is flowing through two different pipes In which an inverted differential manometer having an oil of specific gravity 0.8 is connected. The pressure head in pipe A is 2 m of water. Find the pressure in the pipe B for the values: h= 12 cm, h2 = 10 cm, h1 = 30cm

14

03

04


