

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

## GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-V- EXAMINATION – SUMMER 2016

Subject Code: 151402

Date: 09/05/2016

Subject Name: Food Process Instrumentation & Control

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.

- 1Q a Explain the commercial scales used for measuring specific gravity. 07  
b Describe the Bubbler method and LVDT type hydrometer in details. 07
- 2Q a Explain the principle of target and magnetic flow meter. 07  
b Discuss the construction and types of orifice plate with diagram. 07
- OR**
- b Define Laplace transform of function  $f(t)$ . Find Laplace transform of  $f(t) = \cos kt * u(t)$ ,  $t > 0$ , Where,  $u(t)$  is a unit step function
- 3Q a Discuss different laws of thermocouple with diagram. 07  
b State the importance of pressure measurement in food industry. Write down the basis of categorization of pressure measurement devices. 07
- OR**
- 3Q a What do you understand by flow? Derive the equation for head type flow meter. 07  
b Give the working principle of McLeod gauge with diagram. 07
- 4Q a Discuss the working of Mercury in glass thermometer and LVDT type hydrometer. 07  
b List out its factor of selection. Give a table containing types of thermocouple, material of construction and temperature range. 07
- OR**
- 4Q a Explain the working of Microwave absorption method, Radio frequency Impedance technique for the measurement of moisture. 07  
b Derive a standard equation for first order instrument. Write in detail about feed forward control system. 07
- 5Q a Discuss the working principle of Rotameter type viscometer with diagram. 07  
b Explain the importance of specific gravity measurement in process control. List out different types of instrument used to measure specific gravity. 07
- OR**
- a What is the mathematical structure of a 1<sup>st</sup> order system transfer function? What is the minimum voltage measured by eight bit A/D converter with 7 volt input? 07  
b Describe in brief about bode diagram. 07