Printed Pages:02 **Sub Code:MTEE202**

Paper Id: | 2 | 2 | 0 | 2 | 0 | 2 | **Roll No.** | | | | | | | | | | |

M.Tech

(SEM II) THEORY EXAMINATION 2017-18

Advance Instrumentation Control

Time: 3 Hours ***Total Marks: 70***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.
2. Any special paper specific instruction.

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

a. What do you meant by thermocouple? Write some uses of thermocouple.
b. Draw and explain a block diagram of active transducer.
c. What do you understand by characteristics of static transducer?
d. Explain peltier effect in active transducer.
e. What do you mean by tuning of multivariable controllers?
f. Discuss open loop response for impulse and sinusoidal inputs.
g. Explain piezoelectric transducer?

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

a. Set up a system of jacketed tank used to preheat a process stream. On assuming the capacity of the tank wall to be negligible and temperature inside the jacket to be uniform distributed, determine the response and order of the system.
b. A thermometer is at room temperature of 25°C. It is suddenly put onto vessel containing boiling water at 100°C. What should be the time constant of the thermometer so that it indicates 99.9°C in 1 minute?
c. Discuss the effect of measurement lag and time delay in level measurement.
d. Set up an interactive system with one element as Dead-end system and also determine the response and other of the system.
e. Describe construction and design of piezoelectric transducer. What are the uses of this transducer?

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

(a) Discuss hall transducer and its application. What is the unit of K_H in hall transducer?
(b) For a 1st order system in level control system, measuring the level of a tank, using P-controller, derive the expression for controller with step and ramp change made in the load.

4. Attempt any *one* part of the following: 7 x 1 = 7

(a) For a single capacity process, discuss the effect of PI-control action
(b) Explain with suitable schematic diagram, for pressure control schemes of distillation column.

5. **Attempt any *one* part of the following:** **7 x 1 = 7**

(a) Write a brief not on. Laplace domain analysis of cascade control.

(b) What is ratio and override control schemes?

6. **Attempt any *one* part of the following:** **7 x 1 = 7**

(a) Discuss with optimum controller settings of damped oscillation method.

(b) Explain with suitable schematic diagram of internal reflux control.

7. **Attempt any *one* part of the following:** **7 x 1 = 7**

(a) Draw a block diagram for controlling the column pressure by regulating the flow of water to condenser.

(b) What are the basic modules of a PLC? Describe the inter connections amongst modules