Code No: R1632032 **R16** SET - 1

III B. Tech II Semester Supplementary Examinations, November – 2019

INSTRUMENTATION AND CONTROL SYSTEMS

(Mechanical Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A (14 Marks)

1. a) Define static error. Distinguish reproducibility and repeatability. [2M]
   b) Explain about ionization pressure gauges. [2M]
   c) Distinguish between cryogenic fuel level indicators and bubbler level indicators. [2M]
   d) Define gauge factor. [3M]
   e) What are torsion meters? [3M]
   f) Compare open loop system and closed loop system. [2M]

PART –B (56 Marks)

2. a) Explain the static and dynamic characteristics of measurement systems. [7M]
   b) With neat sketch explain photo electric transducers. [7M]

3. a) Explain the operation of Bimetallic and quartz crystal thermometers. [7M]
   b) A Thermistor has a temperature coefficient of resistance of -0.04 over a temperature range of 20^0 C to 40^0 C. Find the resistance of the thermistor at 35^0 C, if the resistance of the thermistor at 300 C is 200 Ω. [7M]

4. a) Discuss about hot – wire anemometer. [7M]
   b) Explain the principles of seismic instruments. Using this principle explain the operation of vibrometer. [7M]

5. a) Derive an expression for gauge factor of a strain gauge. [7M]
   b) Explain method of usage of resistance strain gauge for bending compressive and tensile strains. [7M]

6. a) Explain with necessary diagrams the working principle of an absorption psychrometer. [7M]
   b) Discuss about Elastic force meters. [7M]

7. a) With an example, explain the open loop control system. [7M]
   b) Derive the transfer function for D.C servomotor. Explain about torque-speed characteristics. [7M]

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