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

III B. Tech II Semester Supplementary Examinations, April - 2021

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) What are instrumental and environmental errors? How can they be avoided? [2M]
   b) Enumerate the advantages of thermistor. [2M]
   c) Write the advantages of a capacitive level indicator. [3M]
   d) What is meant by gauge factor? [2M]
   e) What are the applications of load cell? [3M]
   f) What is closed loop system? [2M]

PART –B (56 Marks)

2. a) Write the static characteristics of an instrument. [7M]
   b) Explain the functional description of measuring instruments. [7M]

3. a) What is pyrometer? Name two types of pyrometers used in industry. [4M]
   b) What are the different types of manometers? Explain the working of any one of them with neat sketch. What are the different types of errors in manometers? [10M]

4. a) Explain the construction and working of turbine flow meter. [7M]
   b) Differentiate between mechanical and electrical tachometers. [7M]

5. a) Drive an equation for gauge factor for a metallic strain gauge. [7M]
   b) A strain gauge having a resistance 100 Ω and gauge factor of 2 is connected in series with a ballast resistance of 100 Ω across a 12 V supply. Calculate the difference between the output voltage with no stress applied and a stress of 140 MN/m^2. The modulus of elasticity is 200 GN/m^2. [7M]

6. a) What is the importance of humidity control in process industries? [7M]
   b) Explain, with a neat sketch, the construction and working of dynamometer for measurement of power. [7M]

7. a) What are the various elements of control system? Explain in brief. [7M]
   b) Distinguish between open-loop and closed loop control systems with the help of a suitable diagram. [7M]

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