

III B. Tech I Semester Supplementary Examinations, May - 2017
INSTRUMENTATION & CONTROL SYSTEMS
(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

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

PART -A

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|---|----|--|------|
| 1 | a) | Define measurement and explain its significance in our day to day life. | [3M] |
| | b) | What is the case compensation and the full compensation in a filled in system. | [4M] |
| | c) | Explain the principle of operation of Turbine meter for the measurement of fluid velocity. | [4M] |
| | d) | List the main advantage of semi-conductor strain gauges. | [3M] |
| | e) | How absolute humidity is measured. | [4M] |
| | f) | Identify the open-loop and closed loop aspects of cooking. | [4M] |

PART -B

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|---|----|---|------|
| 2 | a) | Explain the difference between: i) Input and output, ii) measurement and instrument and iii) measurand and measurement. | [8M] |
| | b) | What is the function of a sensing element, signal conditioner and indicating element of a measuring instrument? | [8M] |
| 3 | a) | Distinguish between RTD and Thermistors. | [3M] |
| | b) | Explain with the help of suitable sketches, the difference between a Bellow gauge and a diaphragm gauge for pressure measurement. | [8M] |
| | c) | With neat of a suitable sketch. Explain the construction and working principle of bourdon tube pressure gauge? | [5M] |
| 4 | a) | A Stroboscope projects 6000 flashes per minute on a disk mounted on the shaft of a machine. Find the speed of the machine if the disk appears stationary and has a single image of 10 points. | [8M] |
| | b) | Describe the functioning of a stroboscope and explain how speed of a rotating shaft can be measured using a single pattern and multi-pattern disc? | [8M] |
| 5 | a) | Explain the two-arm and four-arm conditions used for strain measurements? | [8M] |
| | b) | Name the various types of strain gauges for different applications? | [8M] |
| 6 | a) | With the help of a neat sketch, explain the working principle of a mechanical humidity sensing absorption hygrometer. | [8M] |
| | b) | How does a mechanical load cell work? Explain the principle of measuring shaft torque using strain gauge torsion meter? | [8M] |
| 7 | a) | What is servomechanism? Describe the features of a servomechanism? | [8M] |
| | b) | What is a block diagram? Explain the steps involved in the preparation of block diagrams? | [8M] |
