Code No: RT31034 **R13** SET - 1

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**

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PART –A

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

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 gauage and a diaphragm gauage 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]

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