Code No: 117EA

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD B. Tech IV Year I Semester Examinations, November/December - 2017 INSTRUMENTATION AND CONTROL SYSTEMS (Common to AME, ME)

Time: 3 Hours

Max. Marks: 75

Note: This question paper contains two parts A and B. Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A

(25 Marks)

l.a)	Define Resolution and Threshold.	[2]
b)	How errors are classified? Enumerate the various sources of errors.	[3]
c)	State the difference between thermometer and thermistor.	[2]
d)	Describe the constructional details and application of different types of	Diaphragm
	pressure gauges.	[3]
e)	State the principle of capacitive level indicator.	[2]
f)	What is a turbine flow meter?	[3]
g)	Define absolute humidity.	[2]
h)	Explain strain gauge rosettes.	[3]
i)	What is a servo mechanism?	[2]
j)	Differentiate Open and closed loop control systems with a suitable examples.	[3]

PART-B

(50 Marks)

2.	Explain the following terms:			
	a) Range and span	b) Resolution		
	c) Calibration	d) Sensitivity.	[10]	
		<u>A</u> D		

OR

- 3. Sketch and explain with a block diagram generalized measurement system and its elements with an example. [10]
- 4. State law of thermocouples. How are the laws useful in construction of thermocouple thermometers? [10]

OR

- 5. Discuss the application areas in which low pressures are maintained. List out various indirect methods for measurement of low pressure and explain any two methods. [10]
- 6. 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. [10]

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OR

- 7.a) Explain the working of mechanical tachometer with a neat sketch.
- b) State the difference between vibrometer and accelerometer. [8+2]
- 8. 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. [10]

OR

- 9. How does a mechanical load cell work? Explain the principle of measuring shaft torque using strain gauge torsion meter. [10]
- 10. Draw a block diagram of closed loop control system. Describe its working for motor speed control. [10]

OR

11. What is a block diagram? Explain the steps involved in the preparation of block diagrams. [10]

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