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Code No: 127EA

## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD B. Tech IV Year I Semester Examinations, November/December - 2018 INSTRUMENTATION AND CONTROL SYSTEMS

	(Common to ME, AME)
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
1	(25 Marks)
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1.a),⁄	State the two differences between the basic and auxiliary functional elements of
	measurement system. [2]
b) '	State the different sources of errors in measurements and measuring instruments. [3]
c) ´	State the advantages of electric transducers over mechanical transducers. [2]
d) ~	Explain why it is desirable to use that piezo-electric transducers should be used for
	measuring of dynamic quantities only. [3]
e) /	State the two advantages and two limitations of rotameter. [2]
m m	State the principles of seismic accelerometer. [3]
0	Define gauge factor. [2]
-	Define Humidity ratio, Dew point temperature and wet bulb temperature. [3]
6.0	Define control system. [2]
	Draw the block diagram representation of a generalized feedback control system.
j) 🗸	Identify the various system components. [3]
	Tuentry the various system components.
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\	PART-B
	(50 Marks)
2,a)	State and explain the basic principles of measurements.
(2,a) b)	Explain about the various stages of general measurement system using a bourdon
0)	pressure gauge as an example with a neat sketch. [5+5]
144. <sub>14</sub>	
7	$\mathbb{D}_{A}$ , $\mathbb{D}_{A}$ , $\mathbb{D}_{A}$ , $\mathbb{D}_{A}$
3.a)	State and explain the dynamic characteristics of a measurement system
b)	What is meant by Zero order system? Write the relevant governing equations. [5+5]
1 1	
	Explain the construction and working principle and advantages of capacitive transducers.
, b)	Explain the working principle of filament type of optical pyrometer with a neat diagram.
	[5+5]
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5.a)	Derive the equations for U-tube manometer for measuring the pressure.
b)	Explain the working principle of ionization gauges for measuring the low pressures using
	à neat diagram. [5+5]
	Explain the working principle of ultrasonic of flow level meter.
	Explain the construction and working principle of turbine flow meter with a neat
, i	diagram. State its limitations also. [5+5]
) a	OR OR OA



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7. Explain the construction and working principle of stroboscope. State its advantages and limitations.  8.a) What is meant by strain gauge rosette? Explain about the various types of rosettes.  1. Explain at least one in detail with a near disgram.  OR  9. Explain the construction and working principle of rope brake type absorption dynamometer with a neat diagram.  10.a) Distinguish between open-loop control system and closed-loop control system.  b) Draw and explain block diagram for temperature control system.  [5+5]  OR  11.a) What is meant by servomechanism? Explain its importance.  b) Draw and explain block diagram for position control system.  [5+5]	D1		P <sub>1</sub>						
b) List out various types of electrical hygrometers for measuring the relative humidity. Explain atleast one in detail with a neat diagram.  9. Explain the construction and working principle of rope brake type absorption dynamometer with a neat diagram.  10.a) Distinguish between open-loop control system and closed-loop control system.  10.b) Draw and explain block diagram for temperature control system.  11.a) What is meant by servomechanism? Explain its importance.  12.5 Draw and explain block diagram for position control system.  13.5 Draw and explain block diagram for position control system.  14.5 Draw and explain block diagram for position control system.  15.5 Draw and explain block diagram for position control system.  15.5 Draw and explain block diagram for position control system.  15.5 Draw and explain block diagram for position control system.	7.		construction and	working princip	ole of stroboscope	. State its advan	tages and [10]		
dynamometer with a neat diagram.  10.a)  Distinguish between open-loop control system and closed-loop control system.  Draw and explain block diagram for temperature control system.  OR  11.a)  What is meant by servomechanism? Explain its importance.  Draw and explain block diagram for position control system.  Fig. 12.4  Parallel R1 R1 R1 R1  R1 R1 R1  R1 R1 R1  R1 R1  R1 R1  R1 R1  R1 R1  R1 R1		List out various types of electrical hygrometers for measuring the relative humidity.  Explain at least one in detail with a neat diagram.  OR  [5+5]							
b) Draw and explain block diagram for temperature control system.  What is meant by servomechanism? Explain its importance. Draw and explain block diagram for position control system.  [5+5]  What is meant by servomechanism? Explain its importance. Draw and explain block diagram for position control system.  P1 P1 P1 P1 P1 P1  P1 P1 P1 P1  P1 P1 P1 P1  P1 P1 P1 P1 P1  P1 P1 P1 P1 P1 P1	, 9.	dynamometer	with a neat diag	gram.		en e			
11.a) What is meant by servomechanism? Explain its importance.				am for temperati			[5+5]	į.	
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