Total No. of Questions: 6

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Faculty of Engineering End Sem Examination May-2024 CS3EO05 Sensors & Transducers

Programme: B.Tech. Branch/Specialisation: CSE All

Duration: 3 Hrs. Maximum Marks: 60

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

- ' - '	should be written in full instead of only a, b, c or d. Assume suita otations and symbols have their usual meaning.	ible data
Q.1 i.	Which of the following is caused by careless handling? (a) Systematic error (b) Gross error (c) Random error (d) None of these	1
ii.	In a measuring system what is the term used to specify difference between higher and lower calibration values? (a) Range (b) Span (c) Drift (d) Threshold	y a 1
iii.	Which transducer is known as 'self-generating transducer'? (a) Active transducer (b) Passive transducer (c) Secondary transducer (d) Analog transducer	1
iv.	Following is not an example of transducer: (a) Analogue voltmeter (b) Thermocouple (c) Photo electric cell (d) Pneumatic cylinder	1
v.	For a material capacitance increases with (a) Decrease in area of plates, all other factors constant (b) Increase in distance between plates, all other factors constant (c) Decrease in distance between plates, all other factors constant (d) None of these	
vi.	Inductive proximity sensors can be effective only when the objective of materials. (a) Ferro magnetic (b) Diamagnetic (c) Paramagnetic (d) All of these	ects 1

	V11.	Following is the coded output:	1
		(a) Modulation of amplitude	
		(b) Modulation of frequency	
		(c) Modulation of pulse width	
		(d) All of these	
	viii.	Which element among the following is used to modify the data	1
		before display?	
		(a) Data presentation element	
		(b) Data transmission element	
		(c) Data processing element	
		(d) Variable manipulation element	
	ix.	Digital acquisition systems are used when	1
		(a) Bandwidth is high (b) Bandwidth is medium	
		(c) Bandwidth is zero (d) Bandwidth is low	
	х.	For lower accuracies	1
		(a) Digital acquisition system is used	
		(b) Both digital and analog acquisition systems are used	
		(c) Analog acquisition system is used	
		(d) Mechanical data acquisition system is used	
Q .2		Attempt any two:	
	i.	What are the classifications of instrument errors? Explain about	5
		the causes and remedies for each error in detail.	
	ii.	Discuss the significance of calibration of measuring instruments in	5
		detail.	
	iii.	Define error, accuracy and precision of measurements in detail.	5
Q .3		Attempt any two:	_
	i.	2 is the significance of states and equation of states of	5
		transducers.	_
	ii.	Explain the working and significance of zero order and first order	5
		systems.	_
	iii.	List the factors to be considered for selection of transducer for a	5
		particular application.	

	Attempt any two:	
i.	Explain the working principle of LVDT with suitable diagrams.	5
ii.	Discuss the functioning of Piezoelectric transducer with suitable diagrams.	5
iii.	Explain the terms sensitivity and linearity of transducers with an example for each.	5
	Attempt any two:	
i.	Explain the working of BCD to 7-Segment Display Decoder.	5
ii.	Explain the requisite characteristics of a filter for signal conditioning.	5
iii.	Explain the working of analog to digital converters.	5
	Attempt any two:	
i.	Draw and explain the block diagram of data acquisition systems.	5
ii.	Discuss the single channel and multi-channel data acquisition system in brief.	5
iii.	Compare landline and RF telemetry in detail.	5
	ii.iii.iii.iii.iii.	 i. Explain the working principle of LVDT with suitable diagrams. ii. Discuss the functioning of Piezoelectric transducer with suitable diagrams. iii. Explain the terms sensitivity and linearity of transducers with an example for each. Attempt any two: Explain the working of BCD to 7-Segment Display Decoder. Explain the requisite characteristics of a filter for signal conditioning. Explain the working of analog to digital converters. Attempt any two: Draw and explain the block diagram of data acquisition systems. Discuss the single channel and multi-channel data acquisition system in brief.

Marking Scheme

CS3EO05 (T) Sensors and Transducers

Q.1	i)	В		1	
	ii)	В		1	
	iii)	A		1	
	iv)	A		1	
	v)	C		1	
	vi)	A		1	
	vii)	D		1	
	viii)	C		1	
	ix)	D		1	
	x)	С		1	
Q.2	i.	What are the classifications of instrument errors? the causes and remedies for each error in detail	? Explain about	5	
		classifications of instrument errors -	2 marks		
		causes and remedies -	3 marks		
	ii.	Discuss the significance of calibration of measur detail.	ing instruments in	5	
			2 marks		
			3 marks		
	iii.				
		Definition -	3 marks		
		Examples and importance -	2 marks		
Q.3	i.	Discuss the significance of static and dynamic characteristics.	naracteristics of	5	
		Definition of static and dynamic characteristic	- 2 marks		
		Significance	- 3 marks		
	ii.	Explain the working and significance of Zero Ord Systems.	der and First Order	5	
		Working principle of both	- 4 mark		
		Significance	- 1 mark		
	iii.	List the factors to be considered for selection of particular application.		5	

Diagram—2 marks Description - 3 marks ii. Discuss the functioning of Piezoelectric transducer with suitable diagrams. Diagram Description Diagram Description Diagram Description Description Description Description Definition of sensitivity and linearity of transducers with an example for each. Definition of sensitivity Definition of linearity Definition of linearity Description Decoder. Diagram Description Diagram Description Description Diagram Description			Each factor with justification	- 1 mark each	
ii. Discuss the functioning of Piezoelectric transducer with suitable diagrams. Diagram Description Explain the terms sensitivity and linearity of transducers with an example for each. Definition of sensitivity Definition of linearity Example of each Discuss the functional principle of BCD to 7-Segment Display Decoder. Diagram Description Description Explain the requisite characteristics of a filter for signal conditioning. Each characteristic with justification Explain the working of Analog to Digital converters. Diagram Description Attempt any two Draw and explain the Block Diagram of Data Acquisition Systems. Diagram Description Draw and explain the Block Diagram of Data Acquisition Systems. Diagram Description Description	Q.4	i.	Diagram–2 marks	table diagrams.	5
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iii. Explain the working of Analog to Digital converters. Diagram Description Output Description Output Diagram Description Diagram Diagram Diagram Description Output Diagram Diagram Description Output Diagram		ii.	_	filter for signal	5
iii. Explain the working of Analog to Digital converters. Diagram Description Output Description Output Diagram Description Diagram Diagram Diagram Description Output Diagram Diagram Description Output Diagram			Each characteristic with justification	- 1 mark each	
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system in brief.		11.	system in brief.	-	5
Diagram - 2 marks					
Description - 3 marks			•	- 3 marks	_
iii. Compare landline and RF telemetry in detail. 5		111.	-		5
			Diagram Comparison	- 2 marks - 3 marks	
2 1			•		
Diagram - 2 marks Comparison - 3 marks			Comparison	Jilaiks	
