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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FOURTH SEMESTER B.TECH DEGREE EXAMINATION, JULY 2017

Course Code: AE204

Course Name: SENSORS AND TRANSDUCERS (AE)

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two full questions. Each question carries 15 marks

1	a)	Distinguish between active and passive transducers with suitable examples?	(4)
	b)	What is the necessity of secondary transducer in a measurement system. Illustrate with an example?	(4)
	c)	What is a strain gauge? Define gauge factor of a strain gauge and derive the expression for the same?	(7)
2	a)	Give the classification of transducers based on transduction principle with suitable examples for each transduction.	(7)
	b)	With schematic diagram explain the construction and working of LVDT.	(8)
3	a)	List the desirable characteristics of transducers for a particular measurement.	(4)
	b)	Define the terms: - (i) linearity (ii) resolution	(4)
	c)	What do you mean by loading effect in a linear potentiometer. Derive an expression for finding the percentage loading error.	(7)

PART B

Answer any two full questions. Each question carries 15 marks

4	a)	Describe the constructional features and working of a free gyroscope.	(8)
	b)	With schematic describe the operation of a capacitive level gauge. Write down the relevant equation.	(7)
5	a)	Explain the constructional features of a capacitor microphone.	(5)
	b)	With schematic explain any one method for continuous level measurement.	(5)
	c)	Discuss the suitability of a proving ring type load cell for measurement of force.	(5)
6	a)	With schematic diagram, explain a pneumatic load cell.	(5)
	b)	What is dead weight calibrator. Give its significance in measurement system.	(5)
	c)	Explain the working of a well type manometer for pressure measurement.	(5)

PART C

Answer any two full questions. Each question carries 20 marks

7	a)	State Bernouli's principle.	(5)
	b)	With schematic explain an impeller flow meter.	(5)
	c)	Write the principle of operation of: - (i) seismic sensor (ii) eddy current transducer	(10)
8	a)	Explain the construction of venturi meter and derive expression for flow rate.	(10)
	b)	Define magnetostrictive effect. Discuss the application of this transducer for measurement of force and acceleration.	(10)
9	a)	With schematic diagram explain electromagnetic flow meter.	(8)
	b)	Define Hall effect. Discuss any one application of Hall effect sensor.	(8)
	c)	Explain piezoelectric phenomenon and suggest the materials that exhibit this phenomenon.	(4)

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