

**END SEMESTER EXAMINATION, 2019**

Semester: 5<sup>th</sup>

Subject code: Et-507

Subject: Electronics Instrumentation

Full Marks: 70

Duration: 3 hours

Instructions:

1. Questions on Part A are compulsory
2. Answer any five questions from Part B

<b>PART-A</b>		
<b>MARK-25</b>		
<b>Questions no.</b>	<b>questions</b>	<b>marks</b>
Question 1	Fill in the blanks:	1x10=10
1a	The resistance of the metal _____ with temperature.	
1b	Measurements involves the use of instrument as a physical means of determining _____	
1c	_____ is the instrument which gives the magnitude of the quantity under measurement in terms of physical constant of instruments.	
1d	In a Deflection type instrument, the value of measured quantity depends upon the _____ of the instrument.	
1e	The accuracy of deflection type instrument is _____ than that of the Null type instrument.	
1f	Transducer should have _____ impedance.	
1g	The quantity under measurement makes its first contact with the _____ sensing element.	
1h	Thermistors are fabricated from the _____ materials.	
1i	Turbine flow meters are _____ flow meters.	
1j	In Inductive Transducer, the output voltage of the coil is proportional to the _____ of eddy current.	
<b>Question no.2</b>	<b>Write true or false:</b>	<b>1x10=10</b>
2a	In control of processes and operation the output variable to be	



	controlled is non electrical.	
2b	Null type instrument is more sensitive than deflection type instrument.	
2c	For dynamic measurement null type instrument is more suitable than deflection type instrument	
2d	Primary sensing element is one of the main functional elements of a measuring system	
2e	Wire-wound potentiometer may be used as a transducer for converting mechanical displacement to an electrical output	
2f	In self-generating types inductive transducer current signal is generated in transducer.	
2g	Non self-generating type inductive transducer no external source is required	
2h	In LVDT type transducer soft iron core provides magnetic coupling between primary and secondary coils	
2i	Barium Titanate may be used as a Piezo-electric transducer	
2j	A photo conductive material changes its resistance due to a change in the intensity of the incident light.	
<b>Question no. 3</b>	<b>Choose the correct answer</b>	<b>1x5=5</b>
Q 3a	In photo voltaic Transducer, voltage output is generated due to	
	(i) vibrations (ii) linear velocity (iii) angular velocity (iv) incident of light	
3b	The measurement of pressure can be done by converting the pressure into	
	i) velocity ii) acceleration iii) temperature iv) displacement	
3c	The operation of Pirani gauge depends on variation of the	
	i) Thermal conductivity with velocity ii) Thermal conductivity with pressure iii) Thermal conductivity with temperature iv) none of above.	
3d	Moving coil type Transducer for velocity measurement where voltage generated in the coil is proportional to the	
	i) temperature ii) velocity iii) displacement iv) pressure	
3e	Seismic accelerometer is used for measuring	
	i) pressure ii) acceleration iii) velocity iv) none of these	

<b>PART-B, MARK- 45</b>		
<b>Questions no.</b>	<b>Questions</b>	<b>marks</b>
Question no. 4	Describe the measurement technique of a deflection type instrument (PMMC type) and null type instrument (DC potentiometer type)	4+5
Question		





no.5		
Q5a	What are the desirable characteristics of a transducer for its selection for a particular application?	5
Q5b	What are the main factors for the selection of motion transducer?	4
Question no. 6		
Q6a	Describe the measurement method for measuring motion using variable inductance transducer.	4
Q6b	What is LVDT transducer? How it can be used for the measurement of linear and rotational motion of an object	1+4
Question no. 7		
Q7a	What do you mean by Capacitive type transducer? Point out the main differences between capacitive type transducer and piezo-electric transducer.	1+4
Q7b	Explain Photo-emissive Transducer in details.	4
Question no. 8	What are the different types of Opto-Electrical Transducer? Discuss each of them	9
Question no. 9	Describe the low pressure measurement method using Pirani Gauge and Ionization type vacuum gauge	5+4
Question no. 10	With the help of necessary sketch explain the operation principle of Drag Cup Rotor AC tachometer and also write the advantages and disadvantages of it	9
Question no. 11		
Q11 a	Explain Photoelectric Tachometer in details with its diagram.	4
Q11b	Describe Piezo-electric type Accelerometer along with its features.	5

