Reg.No. _____

Karunya UNIVERSITY
(Karunya Institute of Technology & Sciences)
(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

End Semester Examination – Nov/Dec – 2016

Code : 14EI001
Sub. Name : Sensors and Transducers

Semester : 2016-17 ODD
Duration : 3hrs
Max. marks : 100

Q. No.	Questions				Course outcome	Marks
	PART-A (40X1=40 MULTIPLE CHOICE QUESTIONS)					
1.	Transducer is working based on----------				CO1	
	a. Resistance	b. Capacitance	c. Inductance	d.All of the answer		(1)
2.	Resistance of a device changing with respect to temperature				CO2	
	a. inductive transducer	b.capacitive transducer	c. resistive transducer	d.a & b		(1)
3.	Which one of the following is active transducer?				CO1	
	a. pizeo electric	b. thermistor	c.RTD	d.strain gauge		(1)
4.	Measurement of a given quantity is expressed in _____ values.				CO1	
	a. alpha	b. numerical	c. gamma	d. a&b		(1)
5.	Without measurement, _____ is not possible.				CO1	
	a. Finding error	b. Calibration	c. Control	d. all the above		(1)
6.	The resistance of LDR _____ when exposed to radiant energy				CO1	
	a. Remains unaltered	b. Decreases	c Reaches maximum	d. Increases		(1)
7.	The transducer that converts the input signal into the output signal, which is a discrete function of time is known as _____ transducer.				CO2	
	a Digital	b.capacitive transducer	c. resistive transducer	d.a & b		(1)
8.	A transducer that converts measurand into the form of pulse is called				CO1	
	a. Active transducer	b. Analog transducer	c. Digital transducer	d. Pulse transducer		(1)
9.	Which of the following is a digital transducer?				CO1	
	a. Strain gauge	b. Encoder	c. Thermistor	d. LVDT		(1)
10.	Strain gauge, LVDT and thermocouple are examples of				CO1	
	a. Active transducers	b. Passive transducers	c. Analog transducers	d. Primary transducers		(1)
11.	Sensor is a device which converts _____ into _____.				CO1	
	a. Physical to electrical	b. Primary to secondary	c. electrical to electrical	d. electrical to physical		(1)
12.	How do measure power				CO2	
	a. energy meter	b. thermometer	c. wattmeter	d. all above		(1)
13.	Which one of the following is non electrical quantity.				CO1	
	a. resistor	b. frequency	c. power	d. Pressure		(1)
14.	What unit is following in the energy meter?				CO1	
	a. volt ampere	b. watts	c. amps	d. KWh		(1)
15.	What is frequency?				CO1	
	a. meters/sec	b. no cycles/sec	c. displacement	d. median		(1)

16.	An inverse transducer is a device which converts				CO1	
	a. Physical to electrical	b. Electrical quantity into mechanical quantity	c. Electrical energy into thermal energy	d. An electrical quantity into a non electrical quantity		(1)
17.	A strain gauge is a passive transducer and is employed for converting				CO2	
	a Mechanical displacement into a change of resistance	b. Pressure into a change of resistance	c. Force into a displacement	d. Pressure into displacement		(1)
18.	Resolution of a transducer depends on				CO1	
	a. Material of wire	b. Length of wire	c. Diameter of wire	d.) Excitation voltage		(1)
19.	The sensitivity factor of strain gauge is normally of the order of				CO1	
	a. 1 to 1.5	b. 5 to 10	c. 0.5 to 1.0	d. 1.5 to 2.0		(1)
20.	In wire wound strain gauges, the change in resistance is due to				CO1	
	a. Change in diameter of the wire	b Change in length of the wire	c Change in both length and diameter	d. Change in resistivity		(1)
21.	. _____ is a technology of measurement which serves Sciences, Engineering, Medicine and etc.				CO1	
	a. Instrument	b.Instrumentation	c. Sensor	d. all the above		(1)
22.	Give an example for signal conditioning circuits.				CO2	
	a.Amplifier	b.Filter	c. ADC	d. all the above		(1)
23.	_____ is an active instrument.				CO1	
	a. Petrol Tank Indicator	b. Pressure Gauge	c. Thermometer	d. none of the answer		(1)
24.	Which one is give differential output				CO2	
	a. Wheatstone	b. Potentiometer	c. a & b	d. none of the answer		(1)
25.	The output of a sensor is _____				CO1	
	a. Voltage	b. Current	c. Frequency	d. all the above		(1)
26.	Bonded wire strain gauges are				CO1	
	a. Exclusively used for construction of transducers	b. Exclusively used for stress analysis	c. Used for both stress analysis and construction of transducer	d. Pressure measurement		(1)
27.	Certain type of materials generates an electrostatic charge or voltage when mechanical force is applied across them. Such materials are called				CO2	
	a. Piezo-electric	b. Photo-electric	c. Thermo-electric	d. Photo-resistive		(1)
28.	Quartz and Rochelle salt belongs to _____ of piezo-electric materials				CO1	
	a Natural group	b. Synthetic group	c. Natural or Synthetic group	d. Fiber group		(1)
29.	Piezo-electric transducers are				CO2	
	a. Passive transducers	b. Inverse transducers	c. Digital transducers	d. Pulse transducers		(1)
30.	Piezo – electric transducers work when we apply _____ to it				CO1	
	a Mechanical force	b. Vibrations	c. Illuminations	d. Heat		(1)
31.	which sensor is used to measure displacement _____				CO3	
	a.RTD	b. Thermocouple	c. potentiometer	d.strain gauge		(1)
32.	Which one of the following is not a systematic error?				CO1	

	a. Instrumental error	b. Environmental error	c. Observational error	d. Random error		(1)
33.	What are the factors that affects the environmental error?				CO1	
	a. Stray capacitance	b.cross capacitance	c. Temperature changes	d. all the answers		(1)
34.	Static characteristics means				CO1	
	a.Resopne	b. output change with time	c . output do not change with time	d.calculation		(1)
35.	What is sensitivity?				CO1	
	a. output/input	b. change in output/change in input	c. S=R/V	d. ohms per volt reading		(1)
36.	Piezo electric crystal can produce an emf				CO3	
	a. When external mechanical force is applied to i	b. When radiant energy stimulates the crystal	c. When external magnetic field is applied	d. When the junction of two such crystals are heated		(1)
37.	LVDT windings are wound on				CO1	
	a. Copper	b. Aluminium	c. Ferrite	d. Steel sheets		(1)
38.	The size of air cored transducers in comparison to the iron core parts is				CO1	
	a. Smaller	b. Larger	c. Same	d. Unpredictable		(1)
39.	The principle of operation of LVDT is based on the variation of				CO1	
	a. Mutual inductance	b. Self inductance	c . Reluctance	d. Permanence		(1)
40.	LVDT is an _____ transducer				CO1	
	a. Magneto-strict ion	b. Inductive	c. Resistive	d. Eddy current		(1)

PART B(8 X 5 = 40 MARKS) (ANSWER ANY EIGHT)			
41.	Write short notes on need of instrumentation system.	CO1	(5)
42.	Draw the block diagram of generalized measurement system and define each of its function	CO2	(5)
43.	Illustrate any five static characteristics of measuring instruments	CO1	(5)
44.	Write short notes on capacitive transducer.	CO1	(5)
45.	Write the advantages and disadvantages of RTD	CO2	(5)
46.	Illustrate working principle of thermistor	CO1	(5)
47.	List out the types of errors and describe any two types	CO1	(5)
48.	How do you select a transducer and write the differences between sensor and transducer	CO1	(5)
49.	Write the importance of signals and standards in measuring and control	CO1	(5)
50.	Write short note on thermocouple	CO1	(5)
PART C(2 X 10 = 20 MARKS) (ANSWER ANY TWO)			
51.	With neat sketch explain the construction and operation and working principle of potentiometer and list out its applications	CO2	(10)
52.	Draw the equivalent circuit for piezoelectric transducer and explain its operation with suitable application		(10)
53.	Derive the equation for gauge factor and explain the operation of strain gauge transducer with suitable application	CO2	(10)

ALL THE BEST