VR20 Reg. No: | | | | | | | | | | |

VELAGAPUDI RAMAKRISHNA

SIDDHARTHA ENGINEERING COLLEGE

(AUTONOMOUS)

II/IV B.Tech. DEGREE EXAMINATION, JANUARY, 2023

Third Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

20EI3304 SENSORS AND TRANSDUCERS

Time: 3 hours ***Max. Marks: 70***

Part-A is compulsory

Answer One Question from each Unit of Part - B

Answer to any single question or its part shall be written at one place only

PART-A

10 x 1 = 10M

1.	a.	Define Precision of an Instrument.	**(CO1 K1)**
	b.	Define standard Deviation.	**(CO1 K1)**
	c.	Define Transducer.	**(CO2 K1)**
	d.	On which principle inductance Transducer generally work?	**(CO2 K2)**
	e.	List the applications of Capacitive Transducer.	**(CO2 K3)**
	f.	Explain Frequency of Capacitive Transducer.	**(CO2 K2)**
	g.	Define configuration of smart sensors.	**(CO3 K1)**
	h.	List the types of Stain gauges.	**(CO3 K2)**
	i.	What is the operating principle of colour sensors?	**(CO4 K2)**
	j.	What is the use of IR radiation Sensors.	**(CO4 K2)**

PART-B

4 x 15 = 60M

UNIT-I

2. a. Outline the desirable Dynamic characteristics of instrument. **(CO1 K4) 6M**

   b. The following 10 Observations were recorded when measuringvoltages.8.82,8.06,8.55,7.52,8.86,7.63,7.79,7.78,8.25, and 7.77. Calculate arithmetic mean, standard deviation, variance. **(CO1 K3) 9M**

(or)

3. a. Calculate Dynamic response of Second order instruments to step Response. **(CO1 K3) 6M**

   b. A voltmeter reading 70V on its 100V range and an ammeter reading 80mA on its 150mA range are used to determine the power dissipated in a resistor. Both these instruments are guaranteed to be accurate within ±1.5% at full scaled deflection. Determine limiting error of the power. **(CO1 K3) 9M**

UNIT-II

4. a. Explain Construction details, Characteristics and applications of Resistance Potentiometer. **(CO2 K2) 8M**

   b. Differentiate between the following with suitable examples and necessary diagrams.
   i) Primary and Secondary transducers
   ii) Active and Passive Transducers
   iii) Analog and Digital. **(CO2 K2) 7M**

(or)

5. a. Illustrate thermistors working principle with diagram. **(CO2 K2) 8M**

   b. Discuss the properties of materials used in construction of RTD. **(CO2 K3) 7M**

UNIT-III

6. a. Illustrate the principle, construction sand operation of LVDT. **(CO3 K3) 8M**

   b. Illustrate the principle, construction and operation of RVDT. **(CO3 K3) 7M**

(or)

7. a. Outline the working of variable reluctance accelerometer. **(CO3 K2) 7M**

   b. Illustrate the variable area working principle of capacitive transducers in detail with one application. **(CO3 K3) 8M**

UNIT-IV

8. a. Explain structure of Bio sensor in detail. **(CO4 K2) 7M**

   b. Explain displacement measurement using fiber optic sensors. **(CO4 K2) 8M**

(or)

9. a. Explain the configuration of smart sensor with neat sketch. **(CO4 K2) 6M**

   b. Explain the Operation of proximity sensor and ultrasonicFlow meter in industrial applications. **(CO4 K2) 9M**

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