Total No. of Questions: 6 *Total No. of Printed Pages:2*

Enrollment No.....

Faculty of Engineering

End Sem (Odd) Examination Dec-2022

OE00049 Industrial Instrumentation and Sensors

Programme: B.Tech. Branch/Specialisation: 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.

Q.1 i. R & D is the best example for _____Industry. **1**
(a) Primary (b) Secondary (c) Tertiary (d) None of these

ii. The _____ of a measurement defines how close a result comes to the true value. **1**
(a) Sensitivity (b) Accuracy (c) Precision (d) None of these

iii. The sensors are classified on the basis of- **1**
(a) Functions (b) Performance (c) Output (d) All of these

iv. Biometric Device is a _____ sensor. **1**
(a) Image sensor (b) IR sensor
(c) Motion sensor (d) None of these

v. The flow meter which is replacing the differential pressure meters in its applications is- **1**
(a) Vortex-shedding flow meter (b) Electromagnetic flow meters
(c) Ultrasonic flow meters (d) All of these

vi. A vibrating level sensor consists of- **1**
(a) One piezoelectric oscillators (b) Two piezoelectric oscillators
(c) Three piezoelectric oscillators (d) Four piezoelectric oscillators

vii. Chromatography is a physical method that is used to separate and analyse- **1**
(a) Simple mixtures (b) Complex mixtures
(c) Viscous mixtures (d) Metals

viii. In which type of chromatography, the stationary phase held in a narrow tube and the mobile phase is forced through it under pressure? **1**
(a) Column chromatography (b) Planar chromatography
(c) Liquid chromatography (d) Gas chromatography

P.T.O.

ix. Which of the following can be used for measuring temperature? **1**
(a) Metallic diaphragm (b) Fluid expansion system
(c) Capsule (d) Bourdon tube

x. Which of the following is not a fundamental quantity? **1**
(a) Length (b) Angle
(c) Time (d) Luminous intensity

Q.2 i. Explain the importance of instrumentation in industries. **4**

ii. Describe Static and dynamic characteristics of an Instrumentation system. **6**

OR iii. Explain indicating, recording and controlling instruments with suitable examples. **6**

Q.3 i. List any four applications of sensors. **4**

ii. What do you mean by Sensor technology? Why it is necessary. **6**

OR iii. Explain different types of sensors. **6**

Q.4 i. What is the principle of operation of optical level indicators? **4**

ii. Define flow meter. State classification of flow meters. **6**

OR iii. Explain construction and working of anemometer. State its advantages and disadvantages. **6**

Q.5 i. Explain chromatography? What are the advantages of chromatography over other techniques? **4**

ii. Explain the working of mass spectrometer. What are the components of mass spectrometer? **6**

OR iii. Explain with neat diagram infrared analyzer. **6**

Q.6 Write a short note on any two of the following.

i. Temperature measuring devices. **5**

ii. Chemical sensors. **5**

iii. Radiation measurement. **5**

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Scheme of Marking

	Faculty of Engineering End Sem (Odd) Examination Dec-2022 OE00049 Industrial Instrumentation and Sensors
	Programme: B.Tech. | Branch/Specialisation:

Q.1	i)	R & D is the best example for _____Industry. (d) None of these	1
	ii)	The _____ of a measurement defines how close a result comes to the true value (b) Accuracy	1
	iii)	The sensors are classified on the basis of- (d) All of the above	1
	iv)	Biometric Device is a_____Sensor. (a) Image sensor	1
	v)	The flow meter which is replacing the differential pressure meters in its applications is (a) Vortex-shedding flow meter	1
	vi)	A vibrating level sensor consists of (b) Two piezoelectric oscillators	1
	vii)	Chromatography is a physical method that is used to separate and analyse (b) Complex mixtures	1
	viii)	In which type of chromatography, the stationary phase held in a narrow tube and the mobile phase is forced through it under pressure? (a) Column chromatography	1
	ix)	Which of the following can be used for measuring temperature? (d) Bourdon tube	1
	x)	Which of the following is not a fundamental quantity? (b) Angle	1
Q.2	i.	Explain the importance of instrumentation in industries. importance of instrumentation ---- 4 M	4
	ii.	Describe Static and dynamic characteristics of an Instrumentation system. static characteristics ---- 3 M dynamic characteristics ---- 3 M	6
OR	iii.	Explain indicating, recording and controlling instruments with suitable examples. indicating ---- 2 M recording ----- 2 M controlling ----- 2 M	6
Q.3	i.	List any four applications of sensors. each application ---- 1 M (4 applications ----- 4 M)	4
	ii.	What do you mean by Sensor technology? Why it is necessary. concept of sensor technology ---- 3 M its necessity ----- 3 M	6
OR	iii.	Explain different types of sensors? each type of sensor ---- 2 M (3 sensors ----- 6 M)	6
Q.4	i.	What is the principle of operation of optical level indicators? basic principle of operation ---- 2 M its explanation ----- 2 M	4
	ii.	Define flow meter? State classification of flow meters. definition of flow meter ---- 2 M classification ---- 4 M	6
OR	iii.	Explain construction and working of anemometer. State its advantages and disadvantages. construction details ---- 2 M working details ---------- 2 M advantages ------ 1 M disadvantages ------- 1 M	6
Q.5	i.	Explain about chromatography? What are the advantages of chromatography over other techniques? explanation ----- 2 M advantages ------- 2 M	4
	ii.	Explain the working of mass spectrometer. What are the components of mass spectrometer? working ----- 4 M components ------ 2 M	6
OR	iii.	Explain with neat diagram about infrared analyzer. explanation ----- 4 M diagram ------- 2 M	6
Q.6		Write a short on any two:	
	i.	Temperature measuring devices	5
	ii.	Chemical sensors	5
	iii.	Radiation measurement	5