ERODE SENGUNTHAR ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to Anna University)

Thudupathi, Perundurai, Erode - 638057

III YEAR B.TECH INFORMATION TECHNOLOGY

CONTINUOUS ASSESSMENT TEST 2 - SET 2

Credit : 3 | Maximum Marks : 50

Course Code : 19ECY07 | Date : 25.03.2025

Course Name : SENSORS FOR ENGINEERING APPLICATIONS | Duration : 1h 30m

Q.No	Part A (8 x 1 = 8 Marks)				Bloom's Level	COs
1	Name the primary function of a rotary encoder				RE	CO2
	a) Measure temperature	b) Count the number of rotations	c) Detect humidity levels	d) Convert light intensity into electrical signals		
2	Rotary encoders are commonly used for _____.				UN	CO2
	a) Measuring linear motion	b) Detecting humidity levels	c) Monitoring temperature changes	d) Tracking angular position		
3	Which of the following is not a type of rotation sensor?				RE	CO2
	a) Drag cup device	b) Photodiode sensor	c) Rotary encoder	d) Potentiometer		
4	Find the type of rotation sensor converts mechanical rotation into electrical voltage through the piezoelectric effect.				UN	CO2
	a) Piezoelectric device	b) Drag cup device	c) Rotary encoder	d) Hall-effect sensor		
5	Select the type of light-sensitive component is often used in fiber-optic applications to convert light signals into electrical signals.				UN	CO3
	a) Photo sensor	b) Phototransistor	c) Photoconductor	d) Photovoltaic device		
6	_____ is the most common application of photo resistors (LDRs).				RE	CO3
	a)) Fiber-optic communication	b) Color Termperature Adjustment	c) Light sensing	d) Photoelectric effect		
7	Identify which of the following devices is designed to convert light energy directly into electrical energy?				UN	CO3
	a) Photovoltaic device	b) Photodiode	c) Photo resistor	d) Photomultiplier		
8	Find the component, which is used to convert light energy into electrical energy in solar panels.				RE	CO3

	a) Photo-transistor	b) Photo-conductor	c) Photo-multiplier	d) Photovoltaic device		
Q.No	**Part B (7 x 2 = 14 Marks)**				**Bloom's Level**	**COs**
9	How does a piezoelectric buzzer work and what external force is typically applied to trigger its sound?				UN	CO2
10	A Quartz piezo-electric Crystal having a thickness of 2mm and voltage sensitivity of 0.055 V-m/N is subjected to a pressure of 1.5 MN/m2. Calculate the voltage output.				AP	CO2
11	Design a circuit using an inductive sensor to detect the presence of metallic objects.				CR	CO2
12	Define color temperature and explain how it relates to the perceived color of light sources.				UN	CO3
13	State the basic working principle of fiber-optic communication.				RE	CO3
14	Given the color temperature of a light source is 3500K, calculate the wavelength at which it emits peak radiation.				AP	CO3
15	List the advantages of using a drag cup device for rotation measurement.				RE	CO2

Q.No	**Part C (2 x 14 = 28 Marks)**	**Marks**	**Bloom's Level**	**COs**
16	a) i) Compare and contrast the behavior of piezoelectric materials in response to mechanical stress and electrical potential. How do different materials vary in their piezoelectric properties?	7	UN	CO2
	a) ii) Analyze the role of fiber-optic communication in improving data transfer speeds. How does it compare to traditional copper wire systems in terms of bandwidth and signal quality?	7	UN	CO3
	or			
	b) i) With neat diagram Discuss in detail the construction working of Proximity sensors and its applications.	7	UN	CO2
	b) ii) Design a circuit that utilizes photodiodes and phototransistors to automatically control the brightness of an LED light source based on ambient light conditions. Explain the key components and their functions.	7	UN	CO3
17	a) Examine the factors influencing the efficiency of photovoltaic cells, including material selection, temperature and incident light angle. How do these factors interact to impact overall energy generation?	14	AN	CO3
	or			
	b) Consider a fibre optic probe and design a displacement sensor for transducing displacement in to equivalent electric signal by making necessary assumptions and plot the characteristics curve of the designed sensor.	14	AN	CO3

Course Outcomes	**Marks**

CO2	Apply motion Sensors	26
CO3	Use photo transistor / Photovoltaic devices	52

Blooms Level	UN	RE	AN	AP	EV	CR	**Total**
Marks	36	8	28	4	0	2	**78**

Prepared By	**Scrutinized By**	**Verified By**
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