

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

Sixth Semester B.Tech Degree Regular and Supplementary Examination June 2023 (2019 Scheme)

**Course Code: RAT312****Course Name: SENSORS AND TRANSDUCERS****Max. Marks: 100****Duration: 3 Hours****PART A***Answer all questions, each carries 3 marks.*

	Marks
1 Define Repeatability and Precision of sensors.	(3)
2 Explain the working principle of Hall Effect sensors.	(3)
3 Explain the working of a proximity sensor.	(3)
4 Describe any two active ranging sensors.	(3)
5 Describe any three tasks for which vision sensors can be used.	(3)
6 Explain the steps in vision sensing with a block diagram.	(3)
7 Distinguish between Active and Passive transducers.	(3)
8 Explain the principle of Linear Velocity Transducer.	(3)
9 List the advantage and disadvantage of thermistors.	(3)
10 Illustrate the various components of a LIDAR system with a block diagram.	(3)

**PART B***Answer any one full question from each module, each carries 14 marks.***Module I**

- 11 a) With a neat diagram, explain the working of LVDT. (7)  
 b) Describe the various types of Linear Optical Encoders. (7)

**OR**

- 12 a) Explain the working of force sensors with necessary diagrams. (7)  
 b) Describe the working of Global Positioning System GPS. (7)

**Module II**

- 13 a) Describe the various types of Tactile sensors with necessary diagrams. (9)  
 b) Illustrate the working of a Limit switch with an application. (5)

**OR**

- 14 a) Explain the working of Doppler radar sensor with neat diagram. (7)

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- b) Select a suitable sensor to determine the range of obstacles in a dark environment (7)  
with explanation of its working and diagram.

**Module III**

- 15 a) Explain the working of CCD and CMOS cameras. (8)  
b) Describe the working of night vision cameras. (6)

**OR**

- 16 a) Explain any three image processing techniques involved in a vision system in (9)  
robotics.  
b) Describe the application of sensors in Flexible Manufacturing Systems. (5)

**Module IV**

- 17 a) Describe with diagrams any two types of position transducers. (8)  
b) Classify the various types of LVDT based on armature mechanisms. (6)

**OR**

- 18 a) Explain the working of a piezoelectric transducer with a neat diagram. (7)  
b) Describe the working of various types of accelerometers with necessary diagrams. (7)

**Module V**

- 19 a) Explain the working of RTD. (6)  
b) Explain the measurement of temperature using thermocouples. (8)

**OR**

- 20 a) With a neat diagram, explain the working of Bourdon tube and Diaphragms for (8)  
pressure measurement  
b) Describe with a diagram the working of Ultrasonic level sensor (6)

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