Roll No: | | | | | | | | | | | |

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

PRESIDENCY UNIVERSITY

Presidency University Act, 2013 of the Karnataka Act No. 41 of 2013 | Established under Section 2(f) of UGC Act, 1956
Approved by AICTE, New Delhi | Approved By BCI
Bengaluru

Mid Term Examinations - October 2026

Date: 07/10/2026 **Time:** 09:30 AM - 11:00 AM

Course Code: CIT3401 **Course Name:** Intelligent Sensors and Systems

Semester: Fifth Semester **Max. Marks:** 50 **Weightage:** 50%

CO - Levels	CO1	CO2
Marks	44	46

PART A: Answer Following Questions. 10 M

Q.N.	Questions	M	CO	BT
1	Explain the difference between direct and indirect sensors with suitable examples.	2	CO1	BT2
2	What are smart sensors? Mention their relevance to IoT applications.	2	CO1	BT2
3	Explain the need for amplification and filtering in a sensor signal chain.	2	CO2	BT3
4	What is meant by ADC resolution and sampling rate?	2	CO2	BT3
5	Differentiate between I2C and SPI communication for sensor interfacing.	2	CO2	BT3

PART B : Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
6	Explain the concept of smart sensors and MEMS technology and discuss their significance in IoT applications.	10	CO1	BT2
7	Explain the construction, characteristics, and IoT applications of MEMS-based sensors.	10	CO1	BT2

PART C: Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
8	Explain the working principles and characteristics of thermistors, RTDs, and humidity sensors.	10	CO1	BT2
9	Explain the operating principles and applications of CCD, CMOS, and Time-of-Flight (ToF) imaging sensors.	10	CO1	BT2

PART D: Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
10	An IoT sensor produces a noisy analog output. Apply suitable signal-conditioning techniques to improve the signal quality before digital conversion. Explain the role of SNR, amplification, filtering, and ADC.	10	CO2	BT3
11	An analog environmental sensor must be connected to a microcontroller for continuous monitoring. Apply suitable ADC principles by selecting appropriate resolution and sampling rate, and explain their effect on measurement quality.	10	CO2	BT3

PART E: Answer Any 1 Following Questions. 10 M

PTO (Please Turn Over)

Q.N.	Questions	M	CO	BT
12	An IoT device needs to interface multiple digital sensors. Apply UART, I2C, and SPI communication principles to select an appropriate communication method for the system.	10	CO2	BT3
13	Develop an appropriate sensor-interfacing approach for an IoT system using an ESP32/STM32/Raspberry Pi and explain how the selected platform can acquire and process sensor data at the edge.	10	CO2	BT3