BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: MSC/IMSC **SEMESTER : II/VIII**
BRANCH: PHYSICS/MGI **SESSION : SP/2025**

SUBJECT: EC611 SENSOR AND ACTUATOR

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	Summarize the sensor's classification on basis of principle of operation. Describe each type briefly using suitable examples and figures.	[5]	1	2
Q.1(b)	Explain the concept of drift and its types. What do you mean by sensitivity of an instrument?	[5]	1	2
Q.2(a)	Explain the principle of strain gauge with gauge factor. Suggest a circuit for measurement of piezoresistance.	[5]	2	2
Q.2(b)	With help of suitable diagrams, illustrate the principle of thermocouples and thermosensors using semiconductor devices.	[5]	2	3
Q.3(a)	Compare and contrast the absolute and incremental encoding technique with suitable diagrams.	[5]	3	4
Q.3(b)	Discuss the principles on which proximity sensors are based. Design and explain the working of inductive type proximity sensor.	[5]	3	6
Q.4(a)	What is an actuator? Explain the different types of pneumatic cylinders.	[5]	4	1
Q.4(b)	Compare stepper motor and servo motor with suitable diagram.	[5]	4	4
Q.5(a)	Illustrate the concept and importance of intelligent sensors and smart transmitters.	[5]	5	3
Q.5(b)	Construct a sensor or actuator interface with hardware of your choice using Raspberry Pi. Highlight the apparatus, principle, application, flow diagram and challenges.	[5]	5	6

::::::02/05/2025::::::E