

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

**CLASS: MTECH/PRE-PHD
BRANCH: ALL**

**SEMESTER : III/I
SESSION : MO/2025**

SUBJECT: EC611 SENSORS & ACTUATORS

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.
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		CO	BL
Q.1(a)	Describe the Sensors and Transducers. Explain the Statics and Dynamics Characteristics of Sensors	[5] 1	2
Q.1(b)	Design and explain the functions of the Signal Conditioning Circuit for CMOS Temperature Sensors.	[5] 1	6
Q.2(a)	Describe the passive and active transducers with suitable examples. Design the Resistive Pressure transducers.	[5] 2	2
Q.2(b)	Explain the Piezoelectric Transducer, Thermoelectric Transducers, Radiation Sensors.	[5] 2	2
Q.3(a)	Describe the Digital Encoder, Shaft Encoder and Switches (Pressure, Level, Flow, Temperature).	[5] 3	2
Q.3(b)	Explain the Recent trends in sensors technology, Fibre Optic Sensors, Silicon sensor, and Bio sensor with suitable diagram.	[5] 3	2
Q.4(a)	Explain the types of actuators, Pneumatic and hydraulic actuators, and Pneumatic cylinders with suitable diagram.	[5] 4	2
Q.4(b)	Describe the Motors, Servomotors, Stepper motors, Relay, Solenoid valves, and Pneumatic Valves with suitable diagram.	[5] 4	2
Q.5(a)	Describe Intelligent sensor architecture, Smart Transmitters, IoT Sensors and its application with suitable examples.	[5] 5	2
Q.5(b)	Design and Deploy the IoT Sensors for Peddy Crop Monitoring.	[5] 5	6

:::20/11/2025:::E