BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION SP/2025)

CLASS: BTECH **SEMESTER : VI**
BRANCH: ECE **SESSION : SP/2025**

SUBJECT: EC357 INTRODUCTION TO INDUSTRIAL INSTRUMENTATION

TIME: 02 Hours **FULL MARKS: 25**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

			CO	BL
Q.1(a)	Explain briefly about the measurand characteristics, and electrical characteristics of transducers.	[2]	1	2
Q.1(b)	Illustrate the concept of operation of fiber optic sensors using block diagram. Describe the working of fiber optic sensor for level measurement with suitable sketch.	[3]	1	2
Q.2(a)	Describe the various transducer types used in biosensors, along with their measurement mode and applications.	[2]	1	2
Q.2(b)	What is a Geiger–Muller counter? Explain its construction and working for detecting radiation.	[3]	1	2
Q.3(a)	Explain the operation of a basic photoemissive cell and a photomultiplier with suitable Sketch.	[2]	1	2
Q.3(b)	Describe Electro-analytical Sensor. Discuss the structure and working of Standard Hydrogen Electrode with an appropriate sketch.	[3]	2	2
Q.4(a)	Summarize the objectives of data acquisition system. Why is it necessary to use a preamplifier and filtering before data processing?	[2]	2	2
Q.4(b)	Illustrate with a block diagram the operation of a multichannel DAS with multiplexing the output of Sample-Hold (S/H) circuits. Write its applications.	[3]	2	2
Q.5(a)	Using circuit diagram, describe the instrumentation amplifier. State the important features of an instrumentation amplifier.	[2]	2	2
Q.5(b)	Discuss the need and advantages of a sample and hold circuit in a DAS? Demonstrate its working with the help of circuit diagram.	[3]	2	3

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