

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

CLASS: IMSc  
BRANCH: PHYSICS

SEMESTER : IV  
SESSION : SP/2025

SUBJECT: SEC407 BASIC INSTRUMENTATION SKILLS

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
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Q.1(a)	Define least count and range of a measuring instrument. Does accuracy of measurement depend on the least count of the measuring instrument?	[2]	1	2
Q.1(b)	Explain the electromechanical principle used for measurement of voltages.	[3]	1	2
Q.2(a)	Sketch the block diagram of an electronic voltmeter.	[2]	1	1
Q.2(b)	Explain the significance of the number of bits in an analog to digital converter.	[3]	1	2
Q.3(a)	Explain the working of an ac millivoltmeter.	[2]	1	2
Q.3(b)	Describe the construction and working of a cathode ray tube.	[3]	2	2
Q.4(a)	List any four controls on the front panel of a CRO.	[2]	2	2
Q.4(b)	Describe time-base operation of a CRO and explain the function of trigger with the help of a suitable sketch.	[3]	2	3
Q.5(a)	Discuss two main advantages of a DSO over a CRO.	[2]	2	2
Q.5(b)	How will you determine the amplitude and frequency of a sinusoidal waveform using CRO. Explain with the help of a suitable diagram.	[3]	2	3

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