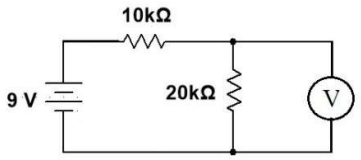
BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION SP/2023)

CLASS: IM.Sc. **SEMESTER : IV**
BRANCH: PHYSICS **SESSION : SP/2023**

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**

			CO	BL
Q.1(a)	Define precision and sensitivity of a measuring instrument.	[2]	1	1
Q.1(b)	Explain the working principle and construction of a moving coil galvanometer.	[3]	1	2
Q.2(a)	The internal resistance and least count of the voltmeter shown in circuit are 100 $k\Omega$ and 0.01V, respectively. Compare the measured voltage, and actual voltage across 20 $k\Omega$ resistance when voltmeter is disconnected. 	[2]	1	2
Q.2(b)	A moving coil galvanometer can be converted into an ammeter of 10 mA range by connecting a shunt resistance of 2.01Ω. The same galvanometer can be converted into a voltmeter of 1V range by connecting a series resistance of 19.6 $k\Omega$. Determine the internal resistance and full scale deflection current of the galvanometer.	[3]	1	5
Q.3(a)	What are the advantages of electronic voltmeter over a conventional voltmeter?	[2]	1	1
Q.3(b)	Show block diagram of an amplifier-rectifier type ac millivoltmeter and explain the significance of its specifications.	[3]	1	5
Q.4(a)	List the front panel controls of a typical dual-channel cathode ray oscilloscope.	[2]	2	1
Q.4(b)	Explain the construction and working of cathode ray tube.	[3]	2	2
Q.5(a)	Illustrate the function of trigger in an oscilloscope by sketching the typical waveforms with and without trigger.	[2]	2	2
Q.5(b)	Explain how two waveforms are simultaneously displayed in a cathode ray oscilloscope.	[3]	2	2

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