- Electrical and Electronic Measurements and Instrumentation - A. K. Sawhney
- Electronic Measurements and Instrumentation - R K Rajput

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Question Bank

Module 1: Chapter 1, 2, 3

1. Explain Significance and methods of measurements
2. Distinguish between electrical, electronics and mechanical instruments
3. State functions and applications of measurement systems
4. Explain the elements of a generalized measurement system
5. Discuss the input-output configuration of measuring instruments and measurement system
6. Explain methods of correction for interfering and modifying inputs
7. Discuss accuracy, precision and linearity with reference to measurement system

Module 2: Chapter 14, 16

1. Explain the Wheatstone's bridge method for the measurement of medium resistance
2. Solve examples - 14.11, 14.12, 14.13, 14.14,
3. Explain the Kelvin's double bridge method for the measurement of low resistance
4. Solve examples - 14.15, 14.16
5. Discuss the difficulties of measurement of high resistance
6. Explain the earth resistance measurement by fall of potential method
7. Explain the earth resistance measurement by using megger
8. Solve example - 14.21
9. Discuss the types of sources and detectors used in AC bridges
10. Explain the theory of determining the unknown inductance by Maxwell's inductance bridge.
11. Explain the theory of determining the unknown capacitance by Maxwell's inductance-capacitance bridge
12. Discuss the advantages and disadvantages of Maxwell's inductance-capacitance bridge
13. Explain the theory of Hay's bridge for the measurement of unknown inductance. State the advantages and disadvantages
14. Explain the theory of Anderson's bridge for the measurement of unknown inductance State the advantages and disadvantages
15. Explain the theory of determining the unknown capacitance by De Sauty's bridge
16. Explain the theory of determining the unknown capacitance by Schering bridge
17. Explain the sources of errors in bridge circuits.
18. Discuss the precautions and techniques for reducing the errors in bridge circuits
19. Explain Wagner earthing device as the shielding for bridges
20. Solve examples - 16.3, 16.4, 16.5, 16.6, 16.7, 16.8, 16.9. 16.10

Module 3: Chapter 10, 18

1. With neat schematic diagrams, discuss CT and PT. State advantages of Instrument Transformers
2. What is shunt and multiplier in instruments? Discuss the disadvantages of shunt and multipliers
3. Discuss various ratios and burden of Instrument Transformers in detail
4. With a neat schematic diagram, explain the method using CT for the measurement of current and power in a circuit
5. With the help of equivalent circuit of a CT and phasor diagrams, derive the expressions for transformation ratio and phase angle
6. Clearly explain the types of errors in CT
7. Discuss causes of errors and different means to reduce errors in CT
8. Explain various characteristics of CT
9. With the necessary diagrams, explain the construction and theory of CT
10. Solve examples 10.1, 10.2, 10.4, 10.6, 10.8
11. Clearly bring out the differences in CT and PT in a tabular form
12. With the help of equivalent circuit diagram and phasor diagrams for a PT, derive the expressions for transformation ratio and phase angle
13. Discuss various errors in PT and methods to reduce these errors
14. With the necessary diagrams, explain the construction and theory of PT
15. Explain various characteristics of PT
16. Solve examples 10.12, 10.13
17. Discuss the principle requirement of magnetic measurements and types of tests on magnetic materials
18. With a neat schematic diagram, explain the method of measurement of flux density in a ring specimen. Derive the necessary equations.
19. With the help of schematic diagram, discuss the method for determining the magnetizing force for a given specimen
20. Define ‘Leakage Factor’ for an electrical machine. With a neat diagram, explain the method to measure leakage factor with the help of flux meter
21. Solve examples 18.1, 18.2, 18.3, 18.4

Module 4: Chapter 20, 24, 28

1. List the essentials of electronic equipment. State advantages and disadvantages of electronic instruments
2. With a neat sketch/ block diagram, explain i) True RMS reading voltmeter, ii) Electronic multimeter
3. List the types of Digital Volt-Meters (DVM). Explain with a neat sketch/ block diagram, i) Ramp Type DVM, ii) Integration type DVM, iii) Successive approximation type (Potentiometric type) DVM
4. With a neat sketch/ block diagram, explain the working of Q-meter.
5. Solve examples 24.7, 24.8, 24.9

6. With a neat block diagram, explain the working of an electronic energy meter.

Module 5: Chapter 21, 25, 28

1. State the advantages of digital instruments. Compare Digital Vs. Analog Instruments
2. Explain different digital character formats such as - 7 segment display, 14 segment display, dot matrix display with 3X5, 27 Dots, 5X7 dots
3. Write short notes on - a) LED, b) LCD, c) NIxie Tube, d) CRT. State advantages and disadvantages of each.
4. List the types of recorders. Explain - a) Strip chart recorder, b) Galvanometer recorder, c) Null balance type recorder d) Potentiometric recorder
5. Explain - a) Circular chart recorder, b) XY recorder, c) Ultraviolet recorders, d) ECG
6. State the advantages of magnetic tape recorders. Discuss the principle of tape recorders.

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

Internal Assessment-1

Academic Year: 2025-2026	Course Title/Code: ELECTRICAL MEASUREMENTS AND INSTRUMENTATION (BEE306B)	Date:
Semester: 3	Division: -	Time:

Note: *Max. Marks: 25*
1) Answer one FULL question from each part
2) Assume missing data suitably

	PART-A	Marks	RBT	CO
1a	Distinguish between electrical, electronics and mechanical instruments	6	L2	1
1b	Explain the elements of a generalized measurement system	6	L2	1
	OR			
2a	State functions and applications of measurement systems	6	L2	1
2b	Discuss accuracy, precision and linearity with reference to measurement system	6	L2	1
	PART-B	**Marks**	**RBT**	**CO**
3a	Explain the theory of Hay's bridge for the measurement of unknown inductance. State the advantages and disadvantages	7	L2	2
3b	Consider Maxwell's inductance comparison bridge. Arm AB consists of a coil with inductance L1 and resistance r1, in series with a non- inductive resistance R1. Arm BC and arm CD are each a non- inductive resistance of 100 Ohms. Arm AD consists of a standard variable inductor of resistance 32.7 Ohms. Balance is obtained when L2= 47.8 mH and R1 = 1.36 Ohms. Find the resistance r1 and inductance L1 of the coil in arm AB. Also find the Q factor of the coil in arm AB. Assume f=50Hz.	6	L2	2
	OR			
4a	Explain the theory of Anderson's bridge for the measurement of unknown inductance State the advantages and disadvantages	7	L2	2
4b	The four arms of a bridge are : arm AB : an imperfect capacitor C1 with an equivalent series resistance of r1; arm BC: a non-inductive resistance R3; arm CD : a non-inductive resistance R4; arm DA : an imperfect capacitor C2 with an equivalent series resistance of r2,, series with a resistance R2. A supply of 450 Hz is given between terminals A and C and the detector is connected between B and C. At balance : R2=4.8 Ohms, R3= 2.0 Kilo Ohms, R4 = 2.85 Kilo Ohms and C2 = 0.5 microF and r2 = 0.4 Ohms. Calculate the value of C1 and r1 and also of the dissipating factor for this capacitor.	6	L2	2

RBT – Revised Blooms Taxonomy
L1: Remembering, L2: Understanding, L3: Applying, L4: Analyzing, L5: Evaluating, L6: Creating

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Internal Assessment-2

Academic Year: 2025-2026	Course Title/Code: ELECTRICAL MEASUREMENTS AND INSTRUMENTATION (BEE306B)	Date:
Semester: 3	Division: -	Time:

Note: *Max. Marks: 25*
1) Answer one FULL question from each part
2) Assume missing data suitably

	PART-A	Marks	RBT	CO
1a	List the essentials of electronic equipment. State advantages and disadvantages of electronic instruments	6	L2	1
1b	With a neat sketch/ block diagram, explain i) True RMS reading voltmeter, ii) Electronic multimeter	6	L2	1
	OR			
2a	List the types of Digital Volt-Meters (DVM). Explain **(ANY TWO)** with a neat sketch/ block diagram, i) Ramp Type DVM, ii) Integration type DVM, iii) Successive approximation type (Potentiometric type) DVM	6	L2	1
2b	With a neat sketch/ block diagram, explain the working of Q-meter.	6	L2	1
	PART-B	**Marks**	**RBT**	**CO**
3a	Explain different digital character formats such as - 7 segment display, 14 segment display, dot matrix display with 3X5 dots, 5X7 dots	7	L2	2
3b	Write short notes on **(ANY TWO):** a) LED, b) LCD, c) NIxie Tube, d) CRT. State advantages and disadvantages of each.	6	L2	2
	OR			
4a	List the types of recorders. Explain **(ANY TWO)**: a) Strip chart recorder, b) Galvanometer recorder, c) Null balance type recorder d) Potentiometric recorder	7	L2	2
4b	Discuss the principle of tape recorders. State the advantages of magnetic tape recorders.	6	L2	2

RBT – Revised Blooms Taxonomy
L1: Remembering, L2: Understanding, L3: Applying, L4: Analyzing, L5: Evaluating, L6: Creating

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Assessment-1

Academic Year: 2025-2026	Course Title/Code: ELECTRICAL MEASUREMENTS AND INSTRUMENTATION (BEE306B)	Date:
Semester: 3	Division: -	Time:

Note: *Max. Marks: 25*
1) Answer any five FULL question
2) Assume missing data suitably

	Marks	RBT	CO
• Answer any three questions from each module	25	L2	All

RBT – Revised Blooms Taxonomy
L1: Remembering, L2: Understanding, L3: Applying, L4: Analyzing, L5: Evaluating, L6: Creating

Assessment-2

Academic Year: 2025-2026	Course Title/Code: ELECTRICAL MEASUREMENTS AND INSTRUMENTATION (BEE306B)	Date:
Semester: 3	Division: -	Time:

Note: *Max. Marks: 25*
1) Make a group of 3-4 students
2) Consider any one question from Assignment 1

	Marks	RBT	CO
• *Make a 5 Minutes Video. Present the topic in detail.* • *Make the QR Code. Share it to the link.*	25	L2	All

RBT – Revised Blooms Taxonomy
L1: Remembering, L2: Understanding, L3: Applying, L4: Analyzing, L5: Evaluating, L6: Creating