

Enrollment No./Seat No.:

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**Bachelor of Engineering - SEMESTER - III EXAMINATION - WINTER 2025**

**Subject Code: BE03000031**

**Date: 17-12-2025**

**Subject Name: Measurement and Instruments**

**Time: 10:30 AM TO 01:00 PM**

**Total Marks: 70**

**Instructions**

- 1. Attempt all questions.**
- 2. Make suitable assumptions wherever necessary.**
- 3. Figures to the right indicate full marks.**
- 4. Simple and non-programmable scientific calculators are allowed.**

	<b>Marks</b>
<b>Q.1 (a)</b> What is error? Enlist the different types of errors.	<b>03</b>
<b>(b)</b> Define Accuracy, Precision, Calibration and Measurement.	<b>04</b>
<b>(c)</b> Compare Indicating, Recording and Integrating type Instruments on various parameters.	<b>07</b>
<b>Q.2 (a)</b> Discuss the method of Extending the range of meter, with suitable example.	<b>03</b>
<b>(b)</b> Explain in brief, Seven Segment LED display.	<b>04</b>
<b>(c)</b> Discuss the D'Arsonval Galvanometer movement with necessary diagrams and notations.	<b>07</b>
<b>OR</b>	
<b>(c)</b> Explain Digital Voltmeter (DVM), with necessary diagram and notations, in detail.	<b>07</b>
<b>Q.3 (a)</b> Explain various type of CRO Probes in brief.	<b>03</b>
<b>(b)</b> What is Harmonic Analysis? Explain Spectrum Analyzer.	<b>04</b>
<b>(c)</b> Draw the block Diagram of Basic CRO, with notation. Discuss the principle of operation in brief.	<b>07</b>
<b>OR</b>	
<b>(a)</b> Compare Oscilloscope vs Meter.	<b>03</b>
<b>(b)</b> Draw the Lissajous pattern for frequency measurement for 2:1, 3:1, 3:2 and 4:1.	<b>04</b>
<b>(c)</b> Explain DSO (Digital Storage Oscilloscope) with its block diagram.	<b>07</b>
<b>Q.4 (a)</b> Explain Q factor in brief with formulae.	<b>03</b>
<b>(b)</b> Explain Sweep frequency Generators with its block diagram.	<b>04</b>
<b>(c)</b> Discuss the Kelvin Double Bridge method for Resistance measurement with diagram.	<b>07</b>
<b>OR</b>	
<b>(a)</b> Elaborate the various losses of Capacitor measurements.	<b>03</b>
<b>(b)</b> Draw Polyphase Power Measurement scheme and explain with suitable calculation.	<b>04</b>

- (c) Explain and derive formulae to measure self inductance using Anderson bridge with necessary diagram and calculations. 07
- Q.5** (a) What is Loading effect? Explain its elimination techniques. 03
- (b) Explain RS 232 Communication standard, with suitable example. 04
- (c) Discuss the concept of Inductive interference and Shielding with suitable diagrams. 07

**OR**

- (a) Explain Ground level interference in brief with appropriate diagram. 03
- (b) Discuss 20 mA current loop with its advantages and disadvantages. 04
- (c) Show the various difference between Current Transformer and Potential Transformer. 07

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