Seat No./Enrollment No.: _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BACHELOR OF ENGINEERING – SEMESTER 4 – EXAMINATION – SUMMER 2026

Subject Code: BE04000181 **Date: 16/06/2026**

Subject Name: Mechanical Measurement and Metrology

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.**

Q.1	**(a)**	Define Hysteresis and dead zone with example.	**03**
	(b)	Explain the modes of measurement.	**04**
	(c)	Explain the Generalized measurement system with Block diagram.	**07**
Q.2	**(a)**	Explain working principle of bimetallic strip.	**03**
	(b)	Explain the principle of electrical Strain gauges.	**04**
	(c)	Explain in brief, “Thermo couple” with neat sketch.	**07**
		OR	
Q.2	**(c)**	Write a short note on rope brake dynamometer.	**07**
Q.3	**(a)**	Define following terms related to gear measurement : (i) Module (ii) Circular pitch (iii) Pressure angle.	**03**
	(b)	Explain Parkinson gear tester with neat sketch.	**04**
	(c)	State different types of Fits and Explain it with neat sketch.	**07**
		OR	
Q.3	**(a)**	Define following terms related to screw measurement : (i) Pitch (ii) Lead (iii) Crest.	**03**
	(b)	Explain the function of Screw thread.	**04**
	(c)	Explain the three wire method for Screw thread Measurement.	**07**
Q.4	**(a)**	List the different temperature measuring instruments used in mechanical measurements.	**03**
	(b)	Determine diameter of best size wire for M22 × 3 screw thread.	**04**
	(c)	Explain the term LASER and state its full form. explain the working principle of Laser Interferometer with suitable sketch.	**07**
		OR	
Q.4	**(a)**	State the function of a radiation pyrometer.	**03**
	(b)	Determine the setting for a straight spur gear having 40 teeth of module 5 mm.	**04**
	(c)	Explain the construction and working of CMM. Classify the types of CMM and describe how linear distance is measured accurately using CMM.	**07**
Q.5	**(a)**	Define load cell and state its applications.	**03**
	(b)	Classify the different types of gears and explain their applications.	**04**

(c) Explain the different methods used for measurement of surface roughness and compare their applications. **07**

OR

Q.5 **(a)** Define strain gauge and state its applications. **03**

(b) Classify the different types of screw threads with suitable applications. **04**

(c) Describe the working principle of stylus type surface roughness measuring instrument and evaluate its advantages and limitations. **07**

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