Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (NEW) - EXAMINATION – SUMMER 2018

Subject Code:2141901 **Date:24/05/2018**

Subject Name:Mechanical Measurement & 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.**

			MARKS
Q.1	**(a)**	Define the terms: (i) Precision (ii) Backlash (iii)Static error.	**03**
	(b)	(i) Differentiate between Precision and Accuracy. (ii) Compare Line Standard and End Standard.	**04**
	(c)	Explain construction and working of Piezo Electric accelerometer with neat sketch. Also state advantages and limitation.	**07**
Q.2	**(a)**	Describe (i) Profile Error (ii) Pitch Error and (iii) Runout Error in terms of Gear.	**03**
	(b)	Explain the working principal of Pneumatic comparators with neat sketch.	**04**
	(c)	Explain working of Tool Maker's Microscope with neat sketch and its application.	**07**
		OR	
	(c)	What is RTD? Briefly describe construction and working of RTD.	**07**
Q.3	**(a)**	State what is maximum and minimum material limits according to Taylor's principal.	**03**
	(b)	What is Sine Bar? Discuss working of Sine bar when component is of large size.	**04**
	(c)	State working principal of Micrometer and explain its construction, working with sketch.	**07**
		OR	
Q.3	**(a)**	What is measurement error? Classify errors and explain any one in short.	**03**
	(b)	Classify resistance strain gauge and explain any two.	**04**
	(c)	Explain working of rope brake dynamometer also state advantages and limitation.	**07**
Q.4	**(a)**	Explain transducer.	**03**
	(b)	Explain only working of Gear tooth vernire calliper with sketch and list its limitation.	**04**
	(c)	Define following Gear tooth terminology 1. Pitch circle 2. Circular Pitch 3. Module 4. Addendum 5. Dedendum 6.Face 7. Flank.	**07**

OR

Q.4	**(a)**	Compare Resistance thermometer and Thermistor.	**03**
	(b)	List source of errors in filled system thermometers and explain any one.	**04**
	(c)	What is Optical flat? Describe flatness checking using optical flat.	**07**
Q.5	**(a)**	Explain the Root Mean Square value.	**03**
	(b)	Explain working of Proving Ring.	**04**
	(c)	Explain the methods of measuring surface finish.	**07**

OR

Q.5	**(a)**	Explain the characteristics of good comparator.	**03**
	(b)	Compare comparator and measuring instrument.	**04**
	(c)	Explain construction and working of Reed type mechanical comparator.	**07**