

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2024

Subject Code:3162005

Date:24-05-2024

Subject Name: Electro Mechanical 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,

		MARKS
Q.1	(a) What are the applications of measurement?	03
	(b) Write a short note on Digital Signal Processing.	04
	(c) Explain Digital Data Acquisition System with block diagram.	07
Q.2	(a) Briefly explain the selection criterion of transducers.	03
	(b) What are the applications of LVDT?	04
	(c) Explain in detail the “Generalized Measurement System” with all its functional blocks with suitable example.	07
	OR	
	(c) Explain significance of measurement in detail.	07
Q.3	(a) Explain static calibration process with suitable example.	03
	(b) Compare static characteristics with dynamic characteristics for instruments.	04
	(c) Classify the various types of errors in measurement and explain each in detail with suitable example.	07
	OR	
Q.3	(a) Explain working of “Piezoelectric Accelerometer”.	03
	(b) Explain any four modes of measurement.	04
	(c) What are the force measuring devices? Explain any one in detail with neat sketch.	07
Q.4	(a) With schematic diagram explain optical torsion meter.	03
	(b) Explain following characteristics of a transducer: (i) Sensitivity (ii) Repeatability (iii) Drift (iv) Dead zone	04
	(c) Prove that Piezo-Electric transducer is not suitable to measure static quantities.	07
	OR	
Q.4	(a) Compare eddy current dynamometer with rope brake dynamometer.	03
	(b) Write a short note on hysteresis.	04
	(c) With neat sketch explain construction and working of bourdon tube pressure gauge.	07
Q.5	(a) Explain briefly the working principle of Stroboscope with suitable sketch.	03
	(b) Compare thermocouple, RTD and thermistor.	04
	(c) How acceleration can be measured? Discuss any one approach in detail.	07

OR

- Q.5** (a) Write the various applications of DC potentiometer and explain any one briefly using suitable diagram. **03**
- (b) What are the different types of drift possible for an instrument? **04**
- (c) Explain second order system and derive the expression for the same. **07**
