

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER– IV(NEW) EXAMINATION – SUMMER 2015

Subject Code: 2141901

Date: 01/06/2015

Subject Name: Mechanical Measurement and Metrology

Time: 10:30am-1.00pm

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** Explain the working principle of pressure actuated thermometer. List the functional elements. Also draw the block diagram for the same. **07**
- (b)** Differentiate following terms: **07**
- i. Accuracy and precision
 - ii. Threshold and resolution
 - iii. Hysteresis and dead Zone
- Q.2 (a)** State the types of different micrometers and give their application in metrology. **07**
- (b)** Explain how sine bar is used to measure. **07**
- i. Angle of component of small size
 - ii. Angle of component of large size
- OR**
- (b)** Calculate the angle of taper and minimum diameter of internal taper from following readings: Diameter of bigger ball = 10.25 mm
Diameter of smaller ball = 6.07 mm
Height of bigger ball from datum = 30.13 mm
Height of smaller ball from datum = 10.08 mm **07**
- Q.3 (a)** Describe with sketch eddy current dynamometer stating speed, power limit, advantages and limitations. **07**
- (b)** Describe calibration process of high speed fan using stroboscope. **07**
- OR**
- Q.3 (a)** Explain the principle, working and method of speed measurement using stroboscope stating an illustration. **07**
- (b)** Classify torque and power measurement techniques. Explain torsion bar dynamometer. **07**
- Q.4 (a)** Describe with sketch bimetal strip thermometer stating salient features **07**
- (b)** Compare RTD and thermistors as temperature measuring device. **07**
- OR**
- Q.4 (a)** Discuss the calibration of thermometer of liquid-in-glass type. **07**
- (b)** Distinguish between Primary, Secondary, Tertiary and working standards of length. **07**
- Q.5 (a)** Explain Tool maker's Microscope with sketch and its applications. **07**
- (b)** Give classification of comparators and explain Dial indicator with sketch. **07**
- OR**
- Q.5 (a)** Explain the following terms used in surface finish with sketch: **07**
- i. Roughness
 - ii. Waviness
 - iii. Effective profile
 - iv. Centerline of profile
- (b)** Explain Two wire method for measuring effective diameter of thread. **07**
