Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Summer Examination-2017

Subject Name: Mechanical Measurement & Metrology

Subject Code: 4TE04MMM1 **Branch: B.Tech (Mechanical)**

Semester: 4 **Date: 17/05/2017** **Time: 02:00 To 5:00** **Marks: 70**

Instructions:

(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

Q-1 **Attempt the following questions:** **(14)**

a) Find the Least count of a Vernier caliper when its main scale graduation is 49 mm and the Vernier scale is divided in to 50 equal parts **01**

b) Why does Micrometer carry a ratchet stop **01**

c) Clarify the term 'Wringing of slips' **01**

d) State any one use of a Dial test indicator **01**

e) Specify the term Backlash of a micrometer **01**

f) Define Relative Error. **01**

g) Give one example of End standard **01**

h) The error in measurement is the difference between ……. and …….. **01**

i) The international prototype meter is …….. long. **01**

j) Define Calibration Errors. **01**

k) It is not preferred to use sin bar for measuring angles more than …….. degree. **01**

l) What is least count of engineer's steel rule? **01**

m) Give any one stylus probe instrument currently in use for surface finish measurement **01**

n) Define the specification of a Sine bar **01**

Attempt any four questions from Q-2 to Q-8

Q-2 **Attempt all questions** **(14)**

a) What are the reasons behind false reading on Vernier caliper while taking measurements? **03**

b) What is the difference between Workshop gauges and Inspection gauges? **03**

c) Define tertiary measurement and Describe appropriate example of it with neat sketch **08**

Q-3 **Attempt all questions** **(14)**

a) What are the precautions to be taken while using Slip Gauges? **04**

b) Define Metrology and State the objectives of Metrology **04**

c) Draw the neat sketch of Solex Comparator. Give any two demerits of it **06**

Q-4		**Attempt all questions**	**(14)**
	a)	Find the height of the slip gauges if the sine angle is 20 degree using a 100 mm sine bar?	**03**
	b)	How to find out the least count of a universal bevel protractor?	**03**
	c)	Explain working principle of dial indicator with neat sketch and state its practical application of the use of dial indicator	**08**
Q-5		**Attempt all questions**	**(14)**
	a)	Explain the constructional features and basic principles of McLeod gauge used for low pressure measurements.	**07**
	b)	Calculate the angle of taper and minimum diameter of an internal taper from the following readings : Diameter of bigger ball = 10.25 mm Diameter of smaller ball = 6.07 mm height of top of bigger ball from datum = 30.13 mm Height of top of smaller ball from datum = 10.08 mm	**07**
Q-6		**Attempt all questions**	**(14)**
	a)	Give the basic principle and operation of Optical type pyrometer	**07**
	b)	Explain the following methods of evaluating surface finish: 1) Peak to valley height method 2) The average roughness	**04**
	c)	State the limitation of Parkinson gear tester	**03**
Q-7		**Attempt all questions**	**(14)**
	a)	Describe with sketch the construction and working of metal Resistance thermometer and state its merits	**08**
	b)	State the error associated with Bourdon gauges, causes and their rectification	**06**
Q-8		**Attempt all questions**	**(14)**
	a)	State any four methods to accomplish unknown Force measurement	**04**
	b)	State the general care of Metrological equipment?	**03**
	c)	List out the various alignment tests carried out while installing Lathe machine	**07**