



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

UNIVERSITY EXAMINATION FOR:

BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

EMG 2312 : METROLOGY

END OF SEMESTER EXAMINATION

SERIES: JUNE 2017 SERIES

TIME: 2 HOURS

DATE: Pick Date Jun 2017

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

-Drawing instruments

This paper consists of five questions. Attempt any THREE questions.

Do not write on the question paper.

Question ONE

- a) Describe the essential characteristics of comparator. (8 marks)
- (b) Briefly explain how comparators are classified clearly giving examples. (4 marks)
- b) You are provided with a set of M87 slip gauges below. Build up the following dimensions using the least number of gauges. (8 marks)**
- i) 29.778
- ii) 46.0735

Range	increment	pieces
1.001 – 1.009	0.001	9
1.01 -1.49	0.01	49
0.5 – 9.5	0.5	19
10 – 90	10	9
1.0005		1

Question Two

- State the essential considerations in selection of materials for gauges. (5 marks)
- What are the common materials used for gauges? Explain the various processes of manufacturing gauges (10 marks)
- Briefly state and explain Taylors principle of Gauging (5 marks)

Question Three

- Use the following set of metric angle gauges to build up the following angles.
 - $36^{\circ} - 9' - 15''$
 - $111^{\circ} - 8' - 42''$

Give a graphical arrangement of the sets above, i) and ii) (10 marks)

Degrees; 1 3 9 27 41 plus square

Minutes; 1 3 9 27

Seconds: 3 6 18 30

Show the arrangements in i) and (ii) above of the angle gauges with a neat sketch.

- Distinguish between mechanical comparators and optical comparators
 - State FOUR disadvantages of electrical comparators. (10 marks)

Question Four

- State the functions of a quality control engineer (manager) in industry (6 marks)
- List Five advantages of quality Control (5 marks)

c) Explain SIX activities involved in quality audit

(9 marks)

Question Five

a) Explain the procedure to construct a C - Chart with an example.

(8 marks)

b) What are its applications, merits and demerits?

(5 marks)

c) Describe how to perform a calibration of slip gauges.

(7 marks)