



MACHAKOS UNIVERSITY

University Examinations 2017/2018

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL AND MANUFACTURING ENGINEERING

SECOND YEAR SECOND SEMESTER EXAMINATION FOR DIPLOMA IN MECHANICAL ENGINEERING

MED-PR 213: METROLOGY AND MEASURING INSTRUMENTS I

DATE: 11/12/2017

TIME: 8:30 – 10:30 AM

INSTRUCTIONS

This paper consists of *FIVE* questions

Answer question *ONE* (compulsory) and any other *TWO* questions

You need drawing instruments to write this examination.

1.
 - a) Outline SIX objectives of engineering metrology. (6 marks)
 - b) Sketch the International prototype Metre and give the important dimensions. (6 marks)
 - c) Describe the FOUR grades of standards. (8 marks)
 - d) Explain interchangeability. (4 marks)
 - e) Sketch each of the following types of gauges.
 - i Feeler gauge
 - ii Snap gauge. (6 marks)
2.
 - a) Outline SIX desirable features of a comparator. (6 marks)
 - b) Name FOUR types of mechanical comparators. (2 marks)

- c) With the aid of a sketch, explain the working principle of dial gauge. (12 marks)
3. a) i) Sketch and label the parts of a Johansson Mikrokator.
ii) Explain the working principle the Johansson Mikrokator. (15 marks)
- b) Outline FIVE disadvantages of mechanical comparators. (5 marks)
4. a) Define surface texture. (4 marks)
- b) Explain FOUR types of surface texture irregularities. (8 marks)
- c) With the aid of a sketch, show the following elements of machined surface.
i Lay
ii Roughness
iii Waviness. (8 marks)
5. a) Outline FOUR advantages and TWO disadvantages of electrical comparators. (6 marks)
- b) Sketch solex pneumatic comparator and show its principal parts. (14 marks)