



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF ENGINEERING AND TECHNOLOGY

**UNIVERSITY EXAMINATION FOR THE DEGREE IN SCIENCE IN RENEWABLE
ENERGY TECHNOLOGY AND MANAGEMENT**

2ND YEAR 2ND SEMESTER 2023/2024 ACADEMIC YEAR

CENTRE: MAIN CAMPUS

COURSE CODE: TEB 1202

COURSE TITLE: ENGINEERING METROLOGY

EXAM VENUE: STREAM: BSc. REN ENGY TEC & MGT

DATE: /04/2024 EXAM SESSION:

DURATION: 2 HOURS

Instructions

- 1. Answer question 1 (Compulsory) and ANY other two questions**
- 2. Candidates are advised not to write on question paper**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room.**

Question One (Compulsory)

- a) Discuss **TWO** general classes of gauges which span the entire conformance-evaluation function. **(2 Marks)**
- b) Define the following terms **(5 Marks)**
- c) Outline the **THREE** reasons why are sine bars not used for measuring large angles **(3 Marks)**.
- d) Enumerate **FOUR** safety precaution to be followed in the use of slip gauge blocks **(4 Marks)**
- e) List **FIVE** various geometrical checks made on machine tools. **(5 Marks)**
- f) Explain in detail the two methods used for checking the profile of a spur gear profile checking. **(4 Marks)**
- g) Discuss three types of metrology **(3 Marks)**
- h) Explain in detail the various methods used to measure the pitch of a spur gear **(4 Marks)**

QUESTION TWO

- a) Discuss **FOUR** various measurement methods and give an example for each method. **(10 Marks)**.
- b) Discuss five devices used to measure of roundness in the workshop **(10 Marks)**

QUESTION THREE

- a) Briefly Explain the working principle of autocollimator **(8 Marks)**
- b) Using a block diagram discuss elements of generalized measurement system. **(12 Marks)**

QUESTION FOUR

- (a) Discuss **FOUR** comparators used for obtaining magnification. **(8 Marks)**
- (b) Discuss **TWO** methods of describing surface roughness of a work piece **(4 Marks)**
- (c) With the aid of diagrams discuss **THREE** types of fits **(8 Marks)**

QUESTION FIVE

- a) Using neat sketches discuss five type of snap gauge used checking external dimensions **(10 Marks)**
- b) Using well labelled illustration differentiate between precision and accuracy **(4 Marks)**
- c) Discuss **FOUR** types of standards used engineering metrology. **(6 Marks)**