



**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**

**2<sup>ND</sup> YEAR 2<sup>ND</sup> SEMESTER 2024/2025 ACADEMIC YEAR**

**CENTRE: MAIN CAMPUS**

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**COURSE CODE: TEB 1202**

**COURSE TITLE: ENGINEERING METROLOGY**

**EXAM VENUE:LR 6**

**STREAM: BSc. REN ENGY TEC & MGT**

**DATE: 14 /04/2025**

**EXAM SESSION:9-11.00 AM**

**DURATION: 2 HOURS**

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**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) With the help of example differentiate between sensitivity and range. (3 Marks)
- b) Identify **THREE** general classes of gauges that are used for the conformance-evaluation function. (3 Marks)
- c) Outline **FOUR** factors affecting accuracy of instrument. (4 Marks)
- d) List down instruments used for angular measurement. (2 Marks)
- e) State **THREE** basic elements of measurements. (3 Marks)
- f) Outline the three reasons why are sine bars not used for measuring large angles. (3 Marks)
- g) State the principle of interferometry. (2 Marks)
- h) Enumerate **FOUR** advantages of electrical and electronic comparator. (4 Marks)
- i) Highlight **TWO** methods used for measuring length. (2 Marks)
- j) Name any **FOUR** instruments used measuring internal diameters in components. (2 Marks)
- k) Enumerate **TWO** safety precaution to be followed in the use of slip gauge blocks. (2 Marks)

### **QUESTION TWO**

- a) Industrial inspection has acquired significance in recent times Describe **SIX** reasons of the inspection in manufacturing industry. (6 Marks)
- b) Distinguish between systematic and random errors. (10 Marks)
- c) Explain in detail the various methods used to measure the pitch of a spur gear. (4 Marks)

### **QUESTION THREE**

- a) Explain in detail the **TWO** methods used for checking the profile of a spur gear profile checking. (4 Marks)
- b) Discuss **THREE** types of metrology. (6 Marks)

- c) Discuss **FIVE** various measurement methods. (10 Marks)

#### **QUESTION FOUR**

- a) Discuss **FOUR** devices used to measure of roundness in the workshop. (8 Marks)
- b) Discuss **FOUR** types of comparators used for obtaining magnification. (8 Marks)
- c) Discuss **TWO** methods of describing surface roughness of a work piece. (4 Marks)

#### **QUESTION FIVE**

- a) a) Using well labelled diagrams discuss **THREE** types of fits. (6 Marks)
- b) Explain the working principle of angle Dekkor with the help of a neat sketch. (6 Marks)
- c) Using an illustration describe the working principle of sine bar. (4 Marks)
- d) Explain in detail the various methods used to measure the pitch of a spur gear. (4 Marks)