MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ……..

UNIVERSITY ORDINARY EXAMINATION

2023/2024 ACADEMIC YEAR

…… YEAR **……..** SEMESTER EXAMINATION FOR ……..

EET 207 – ELECTRICAL INSTRUMENTATION AND MEASUREMENTS

DURATION: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

1. Answer question one and any other two questions.
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper.

SECTION A: ANSWER ALL QUESTIONS IN THIS SECTION

QUESTION ONE (30 MARKS)

a. Differentiate the following terms:
   i. Accuracy and precision (2marks)
   ii. Indicating instrument and recording instrument (2marks)
b. With the aid of a well labelled diagram, explain the elements of a generalized measurement system. (10marks)
c. State the uses of piezoelectric materials and transducers. (3marks)
d. Explain the classification of standards. (8marks)
e. State five advantages of capacitive transducers. (5marks)

SECTION B – ANSWER ANY TWO QUESTIONS IN THIS SECTION

QUESTION TWO (20 MARKS)

a. Briefly explain the types of errors in measurements. (6marks)
b. State the advantages of mechanical instruments. (5marks)
c. With the aid of a well labelled diagram, explain the working principle of a bourdon tube pressure gauge. (9marks)

QUESTION THREE (20 MARKS)

a. With the aid of a well labelled diagram, explain the two methods of resistance measurement of ammeter-voltmeter method. (6marks)
b. State three methods of phase measurements. (6marks)
c. With the aid of a well labelled diagram, derive the unknown resistance in a Wheatstone bridge. (8marks)

QUESTION FOUR (20 MARKS)

a. Define a transducer. (2marks)
b. With the aid of a well labelled diagram, explain the working principle of an inductive transducer. (6marks)
c. State five pros of electrical transducers. (5marks)
d. With the aid of a well labelled diagram, explain the working principle of rotary variable differential transformers. (8marks)