INTERNATIONAL UNIVERSITY OF EAST AFRICA
'Learning to Succeed'

**FACULTY OF ENGINEERING**

**END OF SEMESTER EXAMINATIONS - APRIL 2025**

**PROGRAMME: DIPLOMA IN ELECTRICAL AND CONTROL ENGINEERING**

**YEAR/SEM: YEAR 1/SEMESTER 1**

**COURSE CODE: DEE1106**

**NAME: BASIC WORKSHOP & TECHNOLOGY**

**DATE: 2025-04-17**

**TIME: 9:00AM-12:00PM**

**INSTRUCTIONS TO CANDIDATES:**

1. Read the instructions very carefully
2. The time allowed for this examination is STRICTLY three hours
3. Read each question carefully before you attempt and allocate your time equally between all the Sections
4. Write clearly and legibly. Illegible handwriting cannot be marked
5. Number the questions you have attempted
6. Use of appropriate workplace examples to illustrate your answers will earn you bonus marks
7. Any examination malpractice detected will lead to automatic disqualification.

**DO NOT WRITE ANYTHING ON THE QUESTION PAPER**

## Section A Answer any THREE QUESTIONS from this section

**Question 1:**

a) As an Engineer, what are the basic features of the workshop known to you? List only 5.
b) You are an ongoing student in the department of Electrical Engineering and were asked by a superior Engineer about the position of workshop practice during your internship exercise, what are your likely responses to his question?
c) Discuss six operations from the raw material of a typical finished product in engineering workshop. You can use a case study of Electrical Engineering.
d) i) Explain personal protective equipment (PPE)
ii) You were employed by Alcatel-Lucent, one of the most powerful companies in Telecommunication as a safety Engineer, explain the safety guides of power tools in their workshop.

**Question 2:**

a) Discuss the physical and chemical properties of engineering materials.

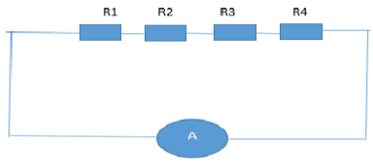
b) Discuss some Non-destructive test methods for metallic and non-metallic materials

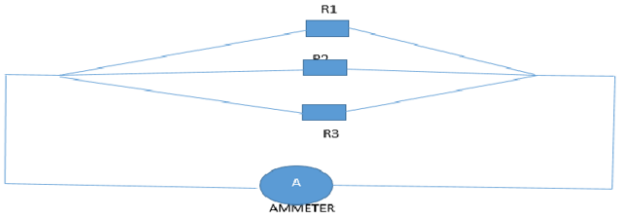
c) Briefly classify engineering materials, and state some factors to be considered for materials for engineering applications.

**Question 3:**

a) i) What is the standard wire gauge used for?
ii) Explain the meaning of **A22WG 7/0.044**.
iii) List 5 electrical workshop tools that are known to you

b) i) As an electrical engineering technician, you were asked by a groundnut seller to explain the purpose of â??earthingâ?• or â??grounding,â?• as seen in most houses. How will you be able to explain the concept of earthing using technical terms?
ii) While working as an intern in a workshop, you were asked to design both series and parallel circuit connection. For a good design, you must understand the difference between series connection and parallel connection, respectively. From the figures below compute the resulting resistance given that R1=1 ohms, R2= 2 ohms, R3= 3 ohms, R4= 4 ohms.




**Question 4:**

a) Differentiate between manufacturing and production.

**b)** List the main varieties of woods used in pattern making and explain any two.

c) i) How will you explain what a switch is as an Electrical Engineer?
ii) List and explain types of circuit known to you as an Electrical Engineer.
iii) List 5 electrical workshop tools that are known to you

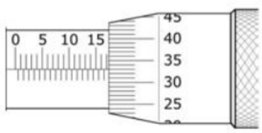
d) i) As an electrical engineering technician, you were asked by a groundnut seller to explain the purpose of "earthing" or "grounding," as seen in most houses. How will you be able to explain the concept of earthing using technical terms?

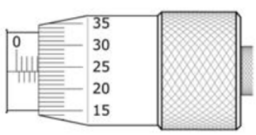
ii) Calculate the earthing rod resistance given that the rod length is 4.765m with a radius of 6.4mm assuming a soil resistivity of 489 Ω-m.

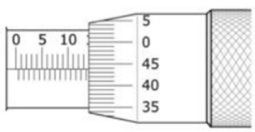
## Section B Answer any TWO QUESTIONS from this section

**Question 1:**

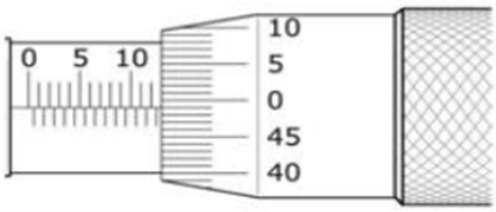
a) State Abbeâ??s principle. Support with example
b) What is the reading on the following micrometer?

1.


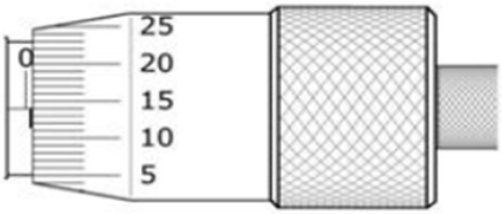

2.



3.


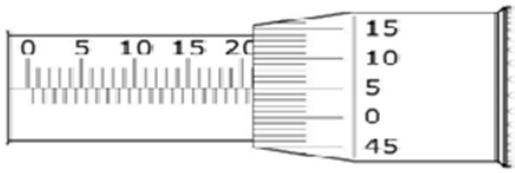
4.




5.



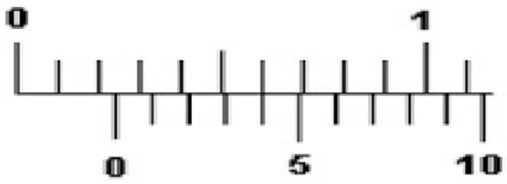

6.

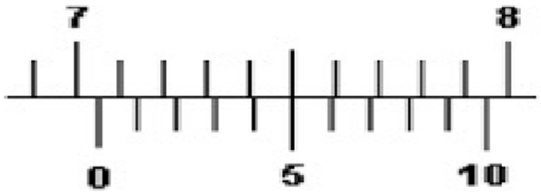


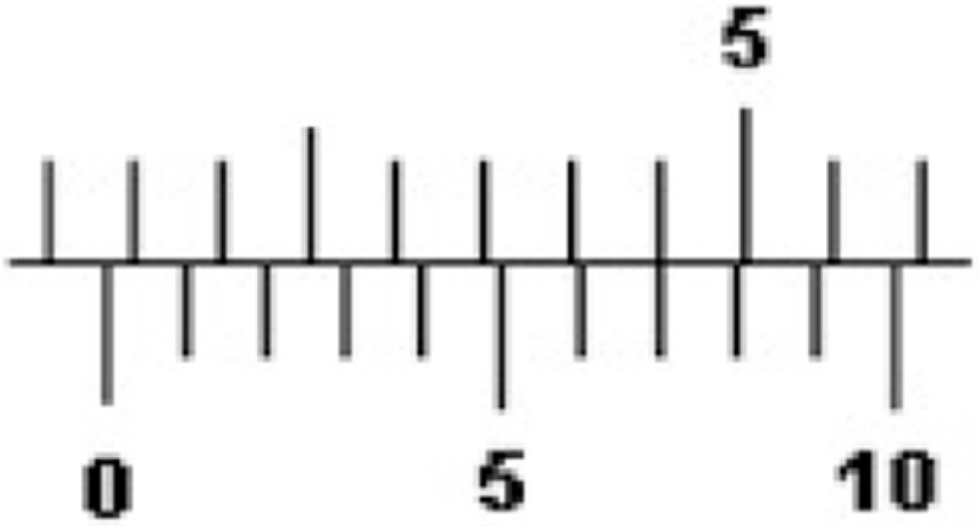

**Question 2:**

a) Describe a situation where you might use a Vernier caliper. Explain why you would use this measurement tool in the situation you described.

b) What is the Vernier caliper measurements shown below?






c) List and explain 4 methods of joining parts in the workshop**.**

**Question 3:**

**a)** What do you understand by â??Fitting workâ?• as a workshop and practice Engineering technology student.

**b)** How do you classify the tools used for Fitting works. Explain any three

c) Briefly state two basic hand tools in the workshop and their uses.

**Question 4:**

a) Briefly state the basic hand tools in the workshop and their uses.

b) Mention some power (machine) tools and state their uses in the workshop

c) Explain the safety tips for maximum utilization and efficiency of power (machine) tools in the workshop