MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ENGINEERING AND TECHNOLOGY

TVET EXAMINATION

2023/2024 ACADEMIC YEAR

SECOND YEAR **FIRST SEMESTER** EXAMINATION FOR DIPLOMA IN
ELECTRIC AND ELECTRONICS ENGINEERING
&
INFORMATION TECHNOLOGY

IT/OS/ICT/CC/01 – BASIC ELECTRONICS

DURATION: 3 HOURS

INSTRUCTIONS TO CANDIDATES:

1. Answer ALL 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 (30 MARKS)
## ATTEMPT ALL QUESTIONS IN THIS SECTION

Q1. Define the following laws in Electronics   (6 marks)
   a)   Kirchoffs current law
   b)   Kirchoffs voltage law
   c)   Ohms law and state the symbol for ohms

Q2. An electric heater consumes 1.8 mJ when connected to a 250V supply for 30 minutes.   Find the power rating of the heater and the current taken from the supply   (5 marks)

Q3. A battery of emf 12V supplies a current of 5A for 2 minutes. How much energy is supplied in this time   (4 marks)

Q4. What is the value of the unknown resistor R in the figure below if the voltage drop across the 500Ω resistor is 2.5 volts
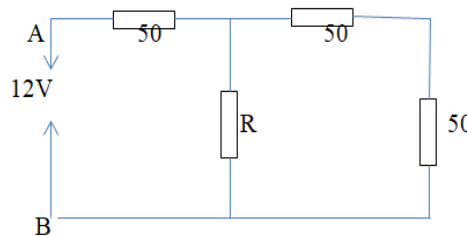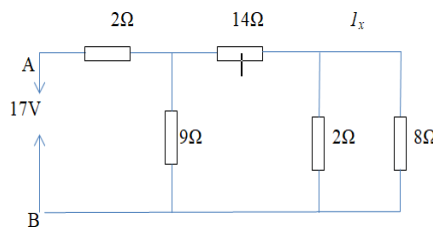

all the values are in ohms.   Determine the current across all the resistors I_{50} , I_{50} , I_R , I_{500}
                    (10 marks)

Q5. A mass of 500kg is raised to a height of 6m in 30s. Find   (5 marks)
   a) The work done
   b) The power developed

SECTION B (20 MARKS)

Q6. a) For the arrangement below find the equivalent resistance Req and calculate the value of current
   I_x (7 marks)

   b) Define the term capacitance and state the applications of a capacitor.   (3 marks)

   c) For how long must a charging current of 2A be fed to a capacitor to raise the p.d. between its plate by 500V.   (3 marks)

   d) Proof that the equivalent resistance of a series connected circuit is $R_1 + R_2 + R_3 ... ... R_n = R_{eq}$ using the loop impedance of a circuit.   (7 marks)