

KENYA CERTIFICATE OF BASIC EDUCATION

SENIOR SCHOOL ASSESSMENT

AUGUST ASSIGNMENT 2026

GRADE 10 – ELECTRICITY TECHNOLOGY

Time: 2 Hours

LEARNER'S DETAILS



Name: _____ . School: _____ .

Assessment Number: _____ . Date: _____ .

School Code: _____ . Signature: _____ .

INSTRUCTIONS TO CANDIDATES

1. Write your full name in the space provided above.
2. Indicate your school and stream clearly.
3. Fill in your admission number and the date.
4. The paper is divided into **Section A and Section B**.
5. Attempt **all questions** in both sections.
6. Respond to all questions in **English**.
7. Write all answers in the spaces provided in the question paper.
8. Do not tear or remove any page from this paper.

FOR OFFICIAL USE ONLY

SECTION	SECTION A	SECTION B	% SCORE	EE1	EE2	ME1	ME2	AE1	AE2	BE1	BE2
SCORE RANGE	30 MARKS	50 MARKS		90-100	75-89	58-74	41-57	31-40	21-30	11-20	1-10
POINTS				8 POINTS	7 POINTS	6 POINTS	5 POINTS	4 POINTS	3 POINTS	2 POINTS	1 POINT
LEARNER'S TOTAL SCORE											

SECTION A (30 MARKS)

Answer ALL questions in this section.

1. A teacher at **Nairobi School** shows learners the image below:



i



ii



iii

a) Identify TWO uses of electricity shown. (2 marks)

- i. _____
- ii. _____
- iii. _____

b) State ONE importance of electricity in hospitals. (1 mark)

2. Four learners discuss careers:

Amina: "I install wiring in buildings."

Brian: "I repair generators."

Chebet: "I design electronic circuits."

David: "I transmit electricity across regions."

a) Identify the career for EACH learner. (2 marks)

Learner	Career

b) Name ONE institution in Kenya where such careers are trained. (1 mark)

3. At a workshop in **Kisumu Polytechnic**, a student is shown:



a) Name the equipment collectively. (1 mark)

b) List TWO items shown. (1 mark)

- i. _____
- ii. _____
- iii. _____

c) State ONE importance of using them. (1 mark)

4. a) Identify THREE components of an electric circuit. (2 marks)

- i. _____
- ii. _____
- iii. _____

b) Define an electric circuit. (1 mark)

5. During a lesson, learners were provided with the following materials

- i. Copper wire
- ii. Plastic rod
- iii. Silicon chip

a) Classify each as conductor, insulator, or semiconductor. (2 marks)

Material	Category

b) Explain ONE property of a conductor. (1 mark)

6. At Eldoret National Polytechnic, learners perform an experiment:

a) State Ohm's Law. (1 mark)



S



T

b) Name TWO instruments shown. (1 mark)

S: _____

T: _____

c) State what each measures. (1 mark)

S: _____

T: _____

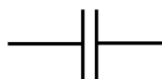
7. a) Distinguish between primary and secondary cells. (2 marks)

b) State ONE maintenance practice for batteries. (1 mark)

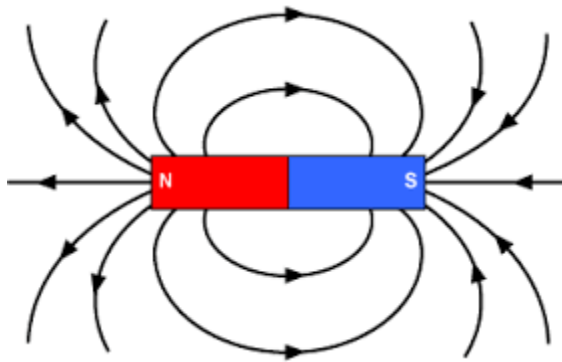
8. a) Define a capacitor. (1 mark)

b) State ONE use in appliances. (1 mark)

c) Identify the symbol shown. (1 mark)



9. Study the illustration below and use it to answer the questions that follow



a) Describe the pattern observed. (1 mark)

b) State TWO properties of magnets. (2 marks)

- i. _____
- ii. _____

10. Grade 10 learners observed the following components



Q



R

a) Identify TWO components shown. (2 marks)

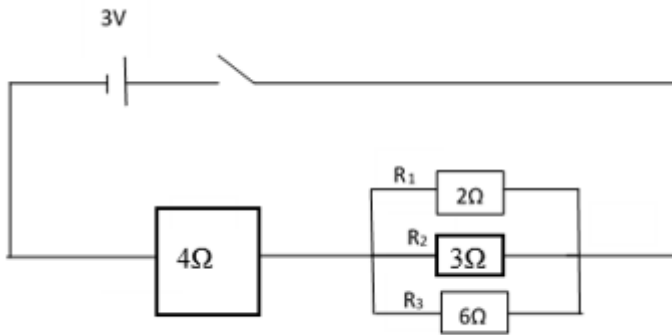
Q: _____

R: _____

b) State ONE importance of power transmission. (1 mark)

SECTION B (50 MARKS)

11. (a) Study the circuit diagram in **figure below** and answer the following question



i) Calculate the effective resistance of the circuit. (3 marks)

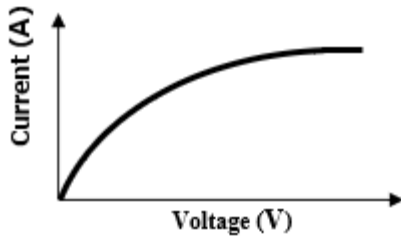
ii) Determine the current through the 3 ohm resistor (4 marks)

b) Eight dry cells can be arranged to produce a total e.m.f. of 12v just like a car battery.

i) Determine the e.m.f. of an individual cell (1 mark)

ii) Explain why it is possible to start a car with the lead acid accumulator, but not with the eight dry cells in series. (2 marks)

c) For a particular bulb, a series of readings of the current through the bulb for different potential differences across it is taken and plotted as shown in **figure** below.



i) Draw the circuit diagram you would use for the experiment. (1 mark)

ii) Explain how the resistance of the bulb changes (2 marks)

d) Distinguish between series and parallel circuits. (2 marks)

e) State TWO advantages of parallel circuits. (2 marks)

- i.

- ii.

- iii.

f) Explain how current behaves in series vs parallel. (2 marks)

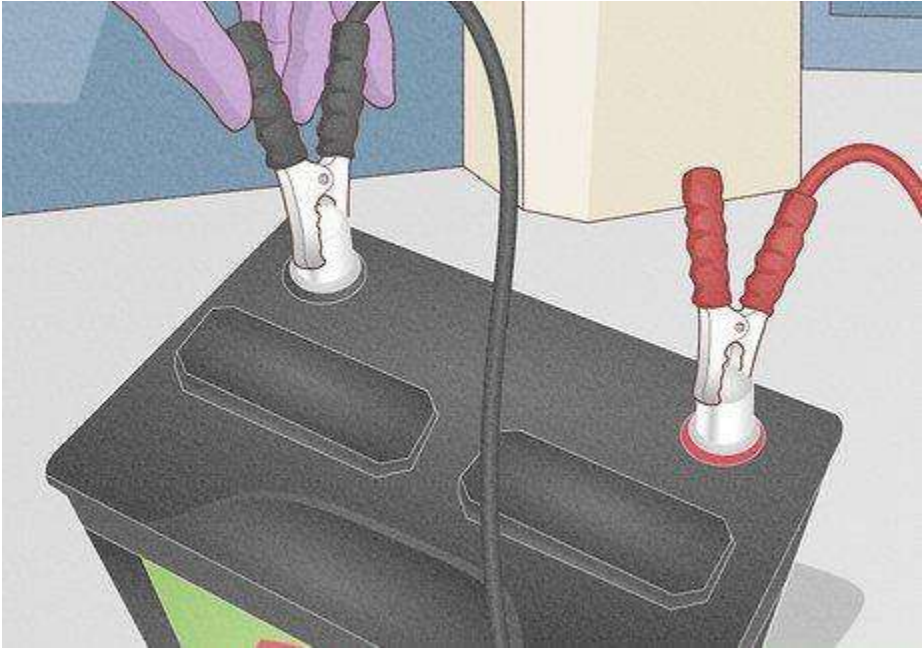
- i.

- ii.

- iii.

g) State Kirchhoff's law (any one). (2 marks)

12. In a garage in **Nakuru**, a technician works on batteries:



a) Describe charging process. (3 marks)

- i. _____
- ii. _____
- iii. _____

b) Explain dangers of overcharging. (2 marks)

- i. _____
- ii. _____

c) Compare series vs parallel battery connection. (3 marks)

Series battery connection	Parallel battery connection

d) State TWO safe disposal methods. (2 marks)

- i. _____
- ii. _____

13. Three learners explain:

Otieno: "Stores charge."

Wanjiku: "Stores energy in magnetic field."

Kiptoo: "Used in smoothing circuits."

a) Identify device for each learner. (3 marks)

Learner	Device

b) Compare capacitor and inductor. (3 marks)

Capacitor	Inductor

c) State TWO applications of each. (4 marks)

- i. _____
- ii. _____

14. At Kenya Technical Trainers College, students build a solenoid:

a) Explain principle of electromagnetism. (3 marks)

- i. _____
- ii. _____
- iii. _____

b) Describe how strength is increased. (3 marks)

- i. _____
- ii. _____
- iii. _____

c) State TWO applications. (2 marks)

- i. _____
- ii. _____

d) Draw/describe field pattern. (2 marks)

15. A house in **Kakamega** has the following:

a) Identify **FOUR** components of a consumer unit. (4 marks)

- i. _____
- ii. _____
- iii. _____
- iv. _____

b) State function of each. (4 marks)

Component	Function

c) Explain importance of earthing. (2 marks)

- i. _____
- ii. _____

16. At **Strathmore School**, learners study semiconductors:

a) Define semiconductor. (2 marks)

b) Explain doping process. (3 marks)

- i. _____
- ii. _____
- iii. _____

c) Distinguish P-type and N-type. (3 marks)

P-type	N-type

d) State **TWO** applications of diodes. (2 marks)

- i. _____
- ii. _____

MARKING SCHEME - ELECTRICITY TECHNOLOGY (GRADE 10)

SECTION A (30 MARKS)

1

a) Uses of electricity (Any 2 × 1 mark)

- i. Powering medical machines
- ii. Lighting
- iii. Running monitors/equipment

b) Importance (1 mark)

- Enables life-saving treatment / supports healthcare services

2

a) Careers (Any 4 correct = 2 marks)

- Amina - Electrician
- Brian - Generator technician/mechanic
- Chebet - Electrical/Electronics engineer
- David - Electrical linesman/power engineer

b) Institution (1 mark)

- Kenya Polytechnic / TVET / University (e.g., University of Nairobi, Technical University of Kenya)

3

a) (1 mark)

- Personal Protective Equipment (PPE)

b) Any 2 (1 mark)

- Helmet
- Gloves
- Safety boots
- Goggles

c) (1 mark)

- Prevents injuries / ensures safety

4

a) Any 3 (2 marks)

- Battery
- Bulb
- Switch
- Connecting wires

b) Definition (1 mark)

- A closed path through which electric current flows

5

a) Classification (2 marks)

- Copper wire - Conductor
- Plastic - Insulator
- Silicon - Semiconductor

b) (1 mark)

- Allows free flow of electrons

6

a) (1 mark)

- Current is directly proportional to voltage at constant temperature

b) (1 mark)

- Ammeter, Voltmeter

c) (1 mark)

- Ammeter - measures current
- Voltmeter - measures voltage

7

a) (2 marks)

- Primary: cannot be recharged
- Secondary: rechargeable

b) (1 mark)

- Clean terminals / maintain water level / avoid overcharging

8

a) (1 mark)

- Device that stores electric charge

b) (1 mark)

- Smoothing / energy storage / filtering

c) (1 mark)

- Capacitor symbol

9

a) (1 mark)

- Magnetic field lines from North to South

b) Any 2 (2 marks)

- Like poles repel
- Unlike poles attract
- Magnets have two poles

10

a) Any 2 (2 marks)

- Transmission lines
- Transformer/substation

b) (1 mark)

- Transmits electricity over long distances

SECTION B (50 MARKS)

11. (a) i) **Parallel**

$$1/R_T = 1/R_1 + 1/R_2 + 1/R_3$$

$$= \underline{\underline{\frac{1}{2}}} + 1/3 + 1/6$$

$$\underline{\underline{3+2+1}} = \underline{\underline{6}}$$

6 6

$$R_{T1} = 1\Omega$$

$$\text{SERIES } R_T = 4+1 = 5\Omega$$

$$\text{ii) } V=IR$$

$$3 = I \times 5$$

$$I = 0.6A$$

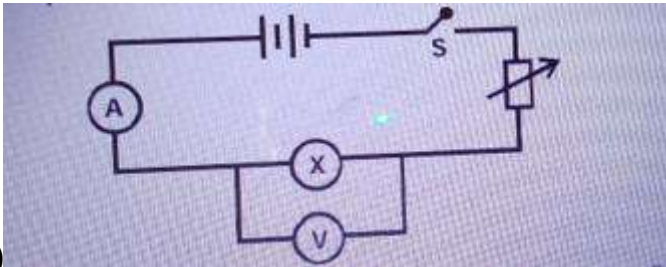
$$V \text{ across } 4\Omega = 4 \times 0.6 = 2.4v$$

$$V \text{ across } 3\Omega = 3 - 2.4 = 0.6v$$

$$I = 0.6/3 = 0.2A$$

$$\text{b) i) } \text{Emf} = 12/8 = 1.5V$$

ii) Internal resistance of the cells. Is high making current insufficient



c) i)

ii) The resistance increases due to heating/increase in temperature.

d) (2 marks)

- Series: one path
- Parallel: multiple paths

e) Any 2 (2 marks)

- Devices operate independently
- Same voltage across components
- Failure of one does not affect others

f) (2 marks)

- Series: current same
- Parallel: current divides

g) (2 marks)

- Kirchhoff's Current Law or Voltage Law

12

a) (3 marks)

- Electrical energy converted to chemical energy
- Current reversed during charging
- Electrolyte reaction restores energy

b) (2 marks)

- Overheating
- Damage to battery
- Explosion risk

c) (3 marks)

- Series: voltage increases
- Parallel: current capacity increases

d) Any 2 (2 marks)

- Recycling
- Proper disposal centers
- Avoid dumping

13

a) (3 marks)

- Otieno - Capacitor
- Wanjiku - Inductor
- Kiptoo - Capacitor

b) (3 marks)

Capacitor

Inductor

Stores charge Stores magnetic energy

Electric field Magnetic field

c) (4 marks)

Capacitor (Any 2):

- Smoothing
- Energy storage

Inductor (Any 2):

- Filters
- Transformers

14

a) (3 marks)

- Current produces magnetic field

b) (3 marks)

- Increase turns
- Increase current
- Use soft iron core

c) (2 marks)

- Electric bell
- Relay

d) (2 marks)

- Circular/concentric field pattern

15

a) Any 4 (4 marks)

- Meter
- Fuse
- Main switch
- Consumer unit
- Earthing

b) (4 marks)

- Meter: measures usage
- Fuse: protection
- Switch: control
- Earthing: safety

c) (2 marks)

- Prevents electric shock

16

a) (2 marks)

- Material with intermediate conductivity

b) (3 marks)

- Adding impurities to improve conductivity

c) (3 marks)

P-type

N-type

Holes majority Electrons majority

d) Any 2 (2 marks)

- Rectification
- LED lighting
- Switching