

KENYA CERTIFICATE OF BASIC EDUCATION

SENIOR SCHOOL ASSESSMENT

AUGUST ASSIGNMENT 2026

GRADE 10 - PHYSICS

Time: 2 Hours

LEARNER'S DETAILS

Name: _____ School: _____

Assessment Number: _____ Date: _____

School Code: _____ Signature: _____

INSTRUCTIONS TO CANDIDATES

1. Write the details as required in the spaces above.
2. This paper consists of two sections: A and B.
3. Answer all questions in section A and section B.
4. Answer the questions in English.
5. All answers **MUST** be written in the spaces provided in the paper.
6. Do **NOT** remove any page from this question paper
7. Silent non programmable calculators may be used.
8. Assume:
 - i. Acceleration due to gravity, $g = 10 \text{ m/s}^2$
 - ii. Density of water = 1000 kg/m^3

FOR OFFICIAL USE ONLY

SECTION	SECTION A	SECTION B	% SCORE	EE1	EE2	ME1	ME2	AE1	AE2	BE1	BE2
SCORE RANGE	30 MARKS	60 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. At **Shankoe Senior School**, three learners are discussing the relevance of Physics in Kenya.

Mwende: "I want to be a Telecommunications Engineer because I love the **Electronics** branch."

Kiprono: "I am interested in how engines work, which falls under **Mechanics**."

Achieng: "I want to study the stars and the universe, which is **Astronomy**."

- (a) **Identify** the branch of Physics that deals with the study of heat and temperature. (1 mark)
-

(b) **Match** the learner to the most relevant career path: (2 marks)

Mwende: _____

Achieng: _____

(c) **State** one relationship between Physics and Geography. (2 marks)

2. **Zavai**, a Grade 10 learner in **Mombasa**, uses a drinking straw to enjoy some juice by the beach.
Study the diagram below.

(a) **Explain** the role of atmospheric pressure in making the juice rise up the straw. (2 marks)

(b) **Identify** the factor labeled h in the formula $P = \rho gh$ used to calculate pressure at the bottom of the ocean in **Kilifi**. (1 mark)

(c) **Name** the hydraulic machine shown below and state the principle it uses. (2 marks)



Name: _____

Principle

3. A technician at a construction site in **Nairobi** is testing different wires.

(a) **Distinguish** between **Ductility** and **Brittleness** based on the graph. (2 marks)

(b) **Define** Hooke's Law as applied to a spring in a weighing scale. (2 marks)

(c) **Identify** the property of a material that resists scratching or indentation. (1 mark)

4. Learners at **Kamukunji Senior School** are investigating why a glass bottle cracks when water inside it freezes.

(a) **Describe** the Anomalous Expansion of Water" between 0°C and 4°C . (2 marks)

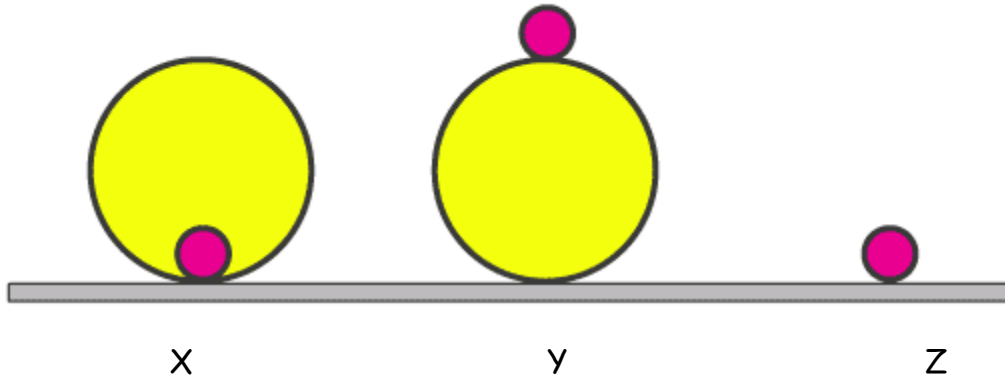
(b) **Name** the device shown below used to control temperature in an electric iron. (1 mark)



(c) **List** two other technologies used to measure temperature besides liquid-in-glass thermometers. (2 marks)

- i. _____
- ii. _____

5. (a) **Identify** the state of equilibrium for the three cones shown below. (3 marks)



X: _____

Y: _____

Z: _____

(b) **Define** the "Center of Gravity" of an object. (2 marks)

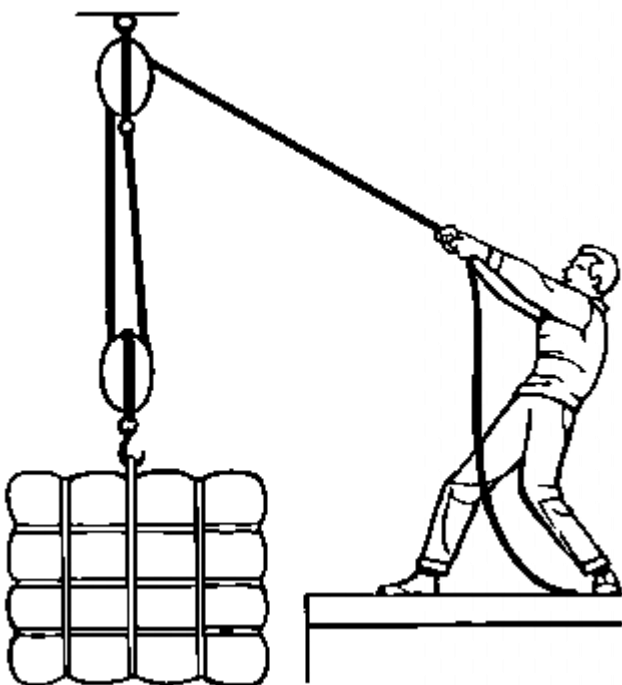
(c) Write whether the following statement is **True** or **False**:

For a body to be in equilibrium, the sum of clockwise moments must equal the sum of anticlockwise moments about the same point. [_____] (1 mark)

(d) **Calculate** the moment of the force in the scenario below. (4 marks)

SECTION B (50 MARKS)

6. A worker at the **Port of Mombasa** uses a pulley system to lift a crate.



(a) **Identify** the type of machine shown and **Name** the parts labeled **Effort** and **Load**. (3 marks)

(b) **Explain** why the efficiency of this machine can never be 100%. (3 marks)

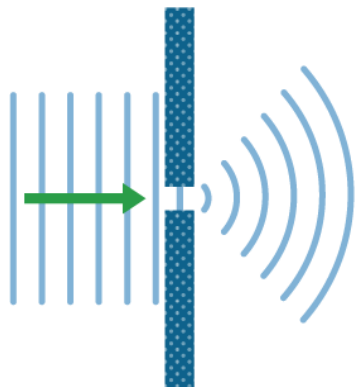
(c) **Distinguish** between **Potential Energy** and **Kinetic Energy** using a swinging pendulum as an example. (4 marks)

Potential energy	Kinetic energy

(d) **Calculate** the work done if a force of 200N moves an object 5m in the direction of the force. (3 marks)

(e) **Outline** one application of an inclined plane in a Kenyan hospital. (2 marks)

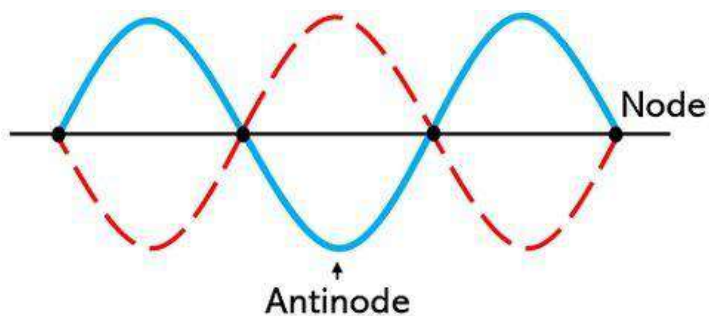
7. Grade 10 learners at **Kenya High School** are observing water waves in a ripple tank.



(a) **Name** the wave property illustrated in the image above. (2 marks)

(b) **Explain** the "Doppler Effect" using the example of a police siren moving through **Nakuru** town. (4 marks)

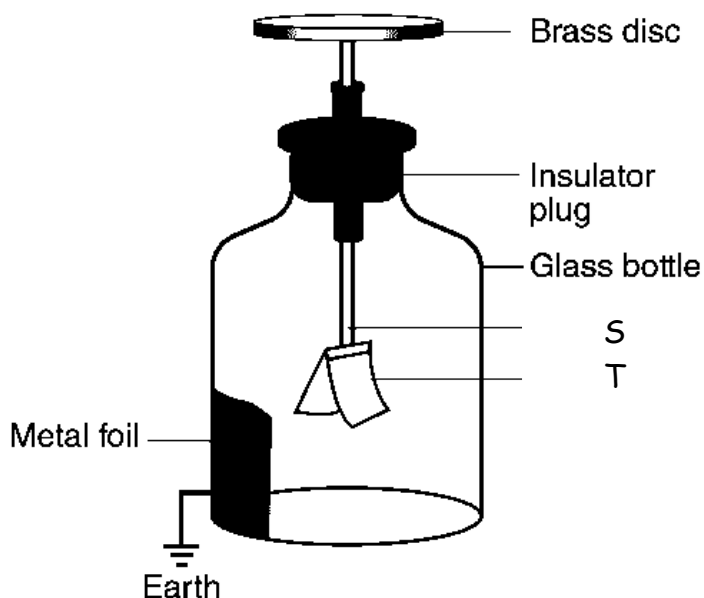
(c) **Identify** the type of wave shown below that is formed by the interference of two identical waves traveling in opposite directions. (2 marks)



(d) **Describe** how **Resonance** can be dangerous to a bridge in **Thika**. (4 marks)

(e) **Define** the term "Refraction" of waves. (3 marks)

8. Study the diagram of the Gold Leaf Electroscope used in a lab in **Eldoret**.



(a) **Name** the parts labeled: (2 marks)

S: _____

T: _____

(b) **Outline** the steps to charge this electroscope negatively by induction. (4 marks)

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

(c) **Identify** the electric field pattern between two unlike charges. (2 marks)

(d) **State** one application of electrostatics in modern industry. (2 marks)

9. (a) **Identify** the three types of radiation based on their penetration power. (3 marks)

- i.

- ii.

- iii.

(b) **Define** "Half-life" of a radioactive isotope. (2 marks)

(c) **Explain** the "Big Bang Theory" regarding the origin of the universe. (3 marks)

(d) **List** two career opportunities available for students interested in Space Physics. (2 marks)

- iv.

- v.

MARKING SCHEME

LEARNING AREA: PHYSICS

GRADE: 10 (SENIOR SCHOOL)

SECTION A (30 MARKS)

1. Introduction to Physics and Careers (5 Marks)

(a) **Branch:** Thermodynamics. (1mk)

(b) **Matching:**

Mwende: Telecommunications Engineer / Electronics Technician. (1mk)

Achieng: Astrophysicist / Astronomer. (1mk)

(c) **Relationship:** Physics provides instruments and methods for Geography, such as using hygrometers to measure humidity or understanding weather patterns through thermodynamics. (2mks)

2. Pressure in Fluids (5 Marks)

(a) **Explanation:** Sucking the air out of the straw creates a partial vacuum (lower pressure) inside the straw. The higher atmospheric pressure acting on the surface of the juice pushes it up into the straw. (2mks)

(b) **Factor h:** Depth below the free surface of the liquid. (1mk)

(c) **Machine & Principle:** Hydraulic Lift . It uses **Pascal's Principle** (Transmission of pressure in fluids). (2mks)

3. Mechanical Properties of Materials (5 Marks)

- (a) **Distinguish: Ductility** is the ability of a material to undergo significant plastic deformation before breaking (e.g., being drawn into wires); **Brittleness** is the tendency to snap or break suddenly with little to no deformation. (2mks)
- (b) **Hooke's Law:** For an elastic material, the extension is directly proportional to the force applied, provided the elastic limit is not exceeded ($F = ke$). (2mks)
- (c) **Property:** Hardness. (1mk)

4. Temperature and Thermal Expansion (5 Marks)

- (a) **Unusual Expansion:** Water contracts when heated from 0°C to 4°C and expands when cooled from 4°C to 0°C . (2mks)
- (b) **Device:** Bimetallic strip / Thermostat. (1mk)

- **(c) Technologies:** Thermocouples, Resistance Temperature Devices (RTDs), Thermistors, or Infrared sensors. (2mks)

5. Moments and Equilibrium (10 Marks)

(a) States: (i) Stable (ii) Unstable (iii) Neutral. (3mks)

(b) Center of Gravity: The single point through which the entire weight of a body appears to act. (2mks)

(c) True/False: TRUE. (1mk)

(d) Calculation:

$$\text{Moment} = \text{Force} \times \text{Perpendicular Distance}$$

$$M = 10\text{N} \times 0.5\text{m} = 5\text{Nm. (Correct formula, substitution, and units required). (4mks)}$$

SECTION B (50 MARKS)

6. Energy, Work, Power, and Machines (15 Marks)

(a) Identify: Block and Tackle (Pulley System). **Effort:** The force applied by the worker. **Load:** The weight of the crate being lifted. (3mks)

(b) Efficiency: Energy is lost due to friction between moving parts and the work done in lifting the weight of the pulleys themselves. (3mks)

(c) Distinguish: **Potential Energy** is stored energy due to position (highest at the swing's peak); **Kinetic Energy** is energy due to motion (highest at the swing's lowest point). (4mks)

(d) Calculation: $\$ \text{Work} = F \times d = 200\text{N} \times 5\text{m} = 1000 \text{ Joules (J)} \$$. (3mks)

(e) Application: Ramps used for wheelchairs or moving heavy medical equipment between different floor levels. (2mks)

7. Waves and Optics (15 Marks)

(a) Property: Diffraction (Waves spreading after passing through a gap). (2mks)

(b) Doppler Effect: The change in frequency of a wave in relation to an observer who is moving relative to the wave source. As the siren approaches, pitch sounds higher; as it recedes, pitch sounds lower. (4mks)

(c) Wave Type: Stationary (Standing) Wave. (2mks)

(d) Resonance: If the frequency of footsteps or wind matches the natural frequency of the bridge, the amplitude of vibration increases significantly, which can cause structural failure/collapse. (4mks)

(e) Refraction: The change in direction (bending) of a wave as it passes from one medium to another of different density, causing a change in speed. (3mks)

8. Electricity and Magnetism (10 Marks)

(a) Parts: **Cap:** Brass Cap. **Leaf:** Gold Leaf (or Aluminum leaf). (2mks)

(b) Induction: 1. Bring a positive rod near the cap. 2. Earth the cap while the rod is still present. 3. Remove the earthing. 4. Remove the rod. (4mks)

(c) Pattern: Field lines moving from the positive charge and entering the negative charge. (2mks)

(d) Application: Electrostatic precipitators (cleaning smoke) or spray painting. (2mks)

9. Radioactivity and Space Physics (10 Marks)

(a) Radiation: Alpha - Stopped by paper;

Beta - Stopped by aluminum;

Gamma - Stopped by lead. (3mks)

(b) Half-life: The time taken for half the radioactive nuclei in a sample to decay. (2mks)

(c) Big Bang: The theory that the universe originated from a very high-density and high-temperature state that began expanding roughly 13.8 billion years ago. (3mks)

(d) Careers: Aerospace Engineer, Satellite Controller, Astrophysicist, or Data Analyst in space agencies. (2mks)