

INTERSECONDARY SCHOOLS EXAMINATION SERIES ISESE



FORM FOUR OPENING TEST JULY PHYSICS 1

031/1

TIME: 3:00 HOURS

Year 2026

Instructions

1. This paper consists of sections **A**, **B**, and **C** with a total of eleven (11) questions.
2. Answer **all** questions in section **A** and section **B**, and **any two** questions from section **C**.
3. Section **A** carries sixteen (16) marks, section **B** carries fifty four (54) marks, and section **C** carries thirty (30) marks.
4. All necessary working and answers for each question must be shown clearly.
5. Mathematical tables, non-programmable calculators, and geometrical instruments may be used where appropriate.
6. Cellular phones and any unauthorized materials are **not** allowed in the examination room.
7. Write your Examination Number on every page of your answer booklet.

SECTION A (16 Marks)

Answer **all** questions in this section.

1. For each of the following items (i) - (x), choose the correct answer from among the given alternatives and write its letter in the answer booklet provided.
 - (i) When a gas is compressed at constant temperature, the gas molecules:
 - A. Move faster than air outside and the pressure is increased.
 - B. Move with uniform speed and the pressure is unchanged.
 - C. Gain more kinetic energy and the pressure is decreased.
 - D. Increase slightly in size and the pressure remains constant.
 - E. Make more impacts per second on the walls of the container.
 - (ii) A car moving at a steady speed has a frictional force on its surface whose size depends on its:
 - A. Speed and surface area.
 - B. Speed.
 - C. Surface area.
 - D. Weight.
 - E. Wheel's speed.
 - (iii) When illuminated by a certain lamp, the shadow of a table-tennis ball on a white screen is uniformly dark. This is because the lamp used is:
 - A. Very bright.
 - B. Fluorescent.
 - C. Very small.
 - D. Very weak.
 - E. Very large.
 - (iv) In a black and white television, the image is formed on the screen by:
 - A. Varying the intensity or brightness of the electron beam.
 - B. Adjusting the number of stations using a remote control.
 - C. Limiting the flow of electrons between the cathode and anode.
 - D. Increasing the grid voltage to its maximum value.
 - E. Adjusting the antenna to capture waves of short wavelength.
 - (v) A green leaf with red flowers when viewed in a red light appears:
 - A. Completely red.
 - B. Completely yellow.

- C. Completely green.
- D. Yellow with red flowers.
- E. Green with red flowers.

(vi) A solid metal cube has each side doubled to make a solid cube of the same metal eight times bigger in volume. The ratio of the resistivity of the new cube to the resistivity of the old cube is:

- A. 8:1
- B. 6:1
- C. 1:1
- D. 1:6
- E. 1:8

(vii) The process of forming hydrogen bubbles around the copper plate of a simple cell is called:

- A. Hydrogenation.
- B. Local action.
- C. Amalgamation.
- D. Polarization.
- E. Capillary action.

(viii) The heat under the ground is used to heat water to maximum leading to produce steam which can turn generators and is totally friendly to the environment of Tanzania. Using physics term, describes which type of energy?

- A. Geothermal energy.
- B. Absorption energy.
- C. Thermal energy.
- D. Heat energy.
- E. Enthalpy energy.

(ix) In a light experiment, the results showed that less light was transmitted and the image was distorted. Which type of material was used?

- A. A transparent material.
- B. An opaque material.
- C. A luminous material.
- D. A translucent material.
- E. A non-luminous material.

(x) Rectification of alternating current means:

- A. Stepping up alternating current by a transformer.
- B. Converting alternating current from a transformer.

- C. Stepping down alternating current from a transformer.
- D. Generating current from a dynamo.
- E. Generating current from a transformer.

2. Match the items in **LIST A** with the correct responses in **LIST B** by writing the letter of the correct response beside the item number in the answer sheet provided.

LIST A	LIST B
(i) Loudness	a) Sound of regular frequency
(ii) Voiceless	b) Sound of irregular frequency
(iii) Tone	c) Rise and fall of sound wave
(iv) Pitch	d) Intensity of the sound
(v) Thimble	e) More reflection of sound in a closed room
(vi) Reverberation	f) Degree of highness or lowness of a tone
	g) Quality of sound produced by an instrument

SECTION B (54 Marks)

Answer **all** questions in this section.

3. (a) The dispersion of white light can be demonstrated using a Newton's disc and a triangular prism. With a well-labelled diagram, explain how the dispersion of white light occurs in a prism and explain what will happen in terms of colour when a disc is rapidly rotating.
- (b) Give:
- (i) Two advantages of having two eyes.
 - (ii) Two ways in which a camera is different from the human eye.
4. Explain the following facts with reference to the principles of physics:
- (a) Shocking absorber reduces impulses.
 - (b) While catching a fast-moving ball, a player moves his hands backwards to avoid injury.
 - (c) A person is better off falling on a wooden floor than on a concrete floor.
5. (a) In designing a new car safety feature, you need to analyze the impact forces during a collision. If a car experiences a horizontal force of 50000 N during a crash, and the vertical force is 10000 N, calculate the resultant force and its

direction. How would this information influence the design of a safety system?

(b) If the air temperature is 20°C and the dew point is 18°C , will there be dew forming on surfaces?

6. (a) Describe how a lens camera operates the same as human eye. Give three points
(b) A 42 kg refrigerator is placed on the back of a stationary pick-up truck. The coefficient of static friction between the refrigerator and the pick-up bed is 0.44. At what rate can the pick-up accelerate without the refrigerator sliding off the back?
7. (a) A constantan wire has a length of 45 cm a diameter of 0.37 mm, and a resistivity of $4.9 \times 10^{-7} \Omega\text{m}$. What will be the current in the wire if it is connected to a 1.5 V cell?
(b) With the aid of a diagram, show the penetrating power of alpha, beta, and gamma rays and their deflection in an electric field.
8. (a) A pressure cooker will cook beans faster than any open saucepan. Give an explanation for this observation.
(b) An insulated cup holds 0.3 kg of water at 0°C . 0.2 kg of boiling water at standard pressure poured into the cup. What will be the final temperature?

SECTION C (30 Marks)

Answer any **two (2)** questions from this section.

9. (a) Consider a rotating metal fan in a magnetic field. Elaborate on how eddy currents induced in the blades can impact its rotation and efficiency. How can these effects be minimized?
(b) When you place an icy drink in a room, you notice that the drink gradually gets warmer. Does this contradict the principle that heat flows from hot to cold objects?
- 10.(a) Amplifiers use transistors made of semi-conductor material. Discuss how energy bands in semi-conductor contribute to signed amplification in electric devices.
(b) An engineer is designing musical instruments that use pipes to produce sound waves. The fundamental frequency of the desired note is 240 Hz. The engineer has two options for the pipe configuration:
(i) One end of the pipe is closed.
(ii) Both ends of the pipe is open.

Calculate the minimum length required for each type of pipe desired fundamental frequency.

11. (a) You are an engineer working on designing an electric car you have a battery with an electromotive force of 12V, external resistance $3\ \Omega$ and an internal resistance of $0.05\ \Omega$.
- (i) Find the current in the circuit and the terminal voltage of the battery
 - (ii) Calculate the power delivered to the load resistor, the power derived to the internal resistance of the battery, and power delivered by the battery.
- (b) You are working with a telescope that consists of an eyepiece with a magnification of $20\times$ and different interchangeable objective lenses with magnification $50\times$, $100\times$ your task is to calculate the total magnification at various setting when using the $100\times$ objective lens, what is the magnification of the telescope?.



INTERSECONDARY SCHOOLS EXAMINATION SERIES
ISESE TIME TABLE
FORM FOUR PRE NECTA SERIES 01
13th July – 17th July 2026

DATE	SUBJECT(S)
13 th July	HISTORY + CIVICS
14 th July	BIOLOGY + ENGLISH
15 th July	CHEMISTRY + LITERATURE
16 th July	PHYSICS + KISWAHILI
17 th July	MATHEMATICS + GEOGRAPHY

GHARAMA

*** SOMO MOJA KWA KIDATO KIMOJA = **20,000/=** KWA MUHULA MZIMA

*** FULL SET KWA KIDATO KIMOJA (KWA MASOMO 11 TU) = **150,000/=** KWA MUHULA MZIMA

ZINGATIA :-

*** GHARAMA ZA MITIHANI HUPANDA KADRI PRE-NECTA SERIES ZITAKAVYOKUWA ZINAENDELEA KUFANYIKA HIVYO LIPIA MAPEMA ILI KUEPUKA USUMBUFU

*** PRE-NECTA SERIES ZITAKUWA ZAIDI YA 10

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