INTERSECONDARY SCHOOLS EXAMINATION SERIES
ISESE

FORM TWO OPENING TEST JULY

031 **PHYSICS**

TIME 2:30 HRS **Year 2026**

INSTRUCTIONS

1. This paper consists of section A, B and C with total of **ten (10**) questions.
2. Answer **all** questions in the space provided.
3. Section A carries **15 marks**, section B carries **70 marks** and section C carries **15 marks**
4. Calculators, cellular phones and any unauthorized materials are not allowed in the examination room
5. Where necessary the following constants may be used
   i. Acceleration due to gravity, g = 10m/s^2 or 10N/Kg
   ii. Pi = 3.14
   iii. Density of water = 1000Kg/m^3 or 1g/cm^3

SECTION A (15 Marks)

Answer **all** questions in this section

1. Answer all questions from this section by writing the letter of the correct answer in the space provided.

i. A Form Two student observes that a metal spoon left in a cup of hot tea becomes hot after a few minutes, while the plastic handle of the spoon remains cool. Which concept explains this observation?
A) Convection
B) Radiation
C) Conduction
D) Evaporation

ii. A learner is designing a simple hydraulic brake system for a school project. Which principle should they apply to ensure that a small force applied on the pedal produces a large force on the brake pads?
A) Archimedes' principle
B) Pascal's principle
C) Bernoulli's principle
D) Hooke's law

iii. Types of callipers are vernier calliper and
A) Micrometer screw gauge
B) Beam calliper
C) Digital callpier
D) Cacoper calliper

iv. Process of removing salts from sea water
A) Desalination
B) Magnetic compass
C) Floatation
D) Bouyancy

v. In a physics experiment, a student hangs different masses on a spring and measures the extension. Which relationship would they expect to find according to Hooke's law?
A) Extension is inversely proportional to the mass
B) Extension is directly proportional to the applied force (within elastic limit)
C) Extension is independent of the applied force
D) Extension increases only after a certain force is exceeded

vi. A Form Two learner is tasked with explaining why a ship made of steel floats on water while a small steel nail sinks. Which statement best explains this using the concept of density and upthrust?
A) The ship has a higher density than water
B) The ship displaces a greater weight of water than its own weight due to its shape
C) The nail has a lower density than the ship
D) The ship is made of a different type of steel

vii. A student uses a thermometer to measure the temperature of boiling water. The liquid in the thermometer rises. Which property of matter is being applied in most liquid-in-glass thermometers?
A) Expansion of solids when heated
B) Expansion of liquids when heated
C) Expansion of gases when heated
D) Contraction of liquids when cooled

viii. In a class demonstration, a teacher places a lit candle near an electric bell inside a glass jar. The bell can still be heard. Then the air is slowly removed from the jar using a vacuum pump. Which observation would most likely occur?
A) The sound becomes louder
B) The sound becomes fainter and eventually stops
C) The candle flame becomes brighter
D) The sound pitch increases

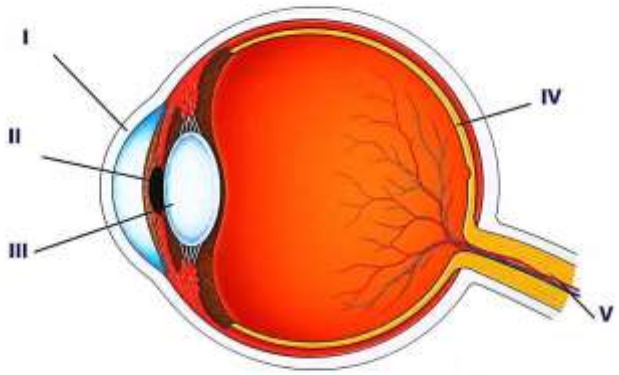
ix. A learner wants to measure the volume of an irregular stone using a measuring cylinder. Which procedure would give the most accurate result?
A) Place the stone in the cylinder and add water to the top
B) Fill the cylinder with water, place the stone, and measure the water spilled
C) Fill the cylinder with water, record initial volume, submerge the stone, and record the final volume
D) Weigh the stone and convert mass to volume using density of stone

x. Which of the following real-life situations best demonstrates the conversion of electrical energy into heat energy?
A) A light bulb glowing
B) A fan rotating
C) An electric iron heating up
D) A radio playing music

ANSWER

i	ii	iii	Iv	V	vi	Vii	viii	ix	x

2. Match the items in **LIST A** with correct responses in **LIST B** by writing the letters of the correct responses besides the item number

LIST A	LIST B
	A. Lens B. Retina C. Optic nerve D. Cornea E. Iris F. Pupil G. Ciliary body and muscle H. Sclera I. Choroid

ANSWER

i	Ii	iii	iv	v

SECTION B (70 Marks)

Answer **all** questions in this section

3. (a) You notice that a metal spoon left in a hot cup of tea becomes warmer to the touch, while a wooden spoon in a similar cup does not show the same change. Formulate a testable hypothesis to investigate the difference in heat transfer.

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(b) An athlete runs round a track three times. Her friend uses a stopwatch to record the time elapsed. At the start of the ride, the stopwatch recorded 6.00s; after one round the stopwatch recorded 180.00s; and at the end of the third round the reading from the stopwatch was 600.00s. What is the average time for one round of the track?

4. (a) A student conducts an experiment to compare the weight of an object on Earth and the moon. They find that the object's weight is six times less on the moon compared to Earth. Explain the difference in weight and why it changes on the moon.

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(b) If an object has a mass of 200g on the earth, how much would it weigh on the moon given that the acceleration due to gravity on the moon is one-sixth that of the earth?

(c) (i) If the volume of an object is increased while its mass is held constant, what happens to its density?

(ii) If a 200g solid lead ball is placed in a eureka can filled with water, what volume of water will overflow? Take the density of lead as 11.3g/cm^3.

5. (a) A salvage ship is attempting to raise an iron anchor off the ocean floor. The anchor has a mass of 560kg and the density of iron is 7800kg/m^3. The cable used to lift the anchor can support a weight of 5000N before breaking. Use 1025kg/m^3 as the density of seawater.
(i) Can the cable support the anchor while it is completely submerged?

(ii) Can the cable support the anchor when it is completely out of the water?

(iii) What percentage of the anchor will be out of the water when the cable breaks?

(b) Imagine you have two glass capillary tubes, one with a narrower diameter and the other wider. Dip both tubes in water and you will notice that the water level in the narrower tube rises higher than the wider one. What can you conclude from this observation?

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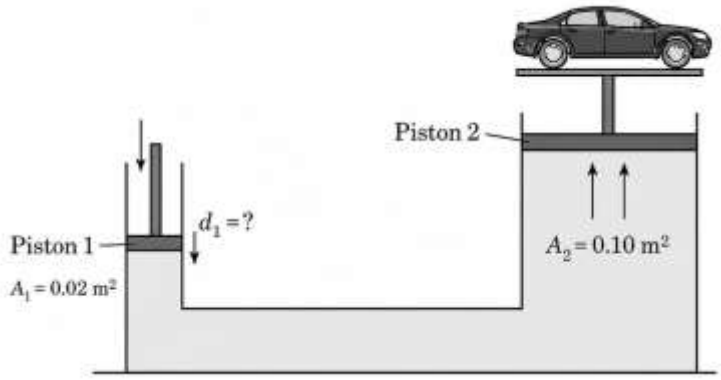
6. (a) Imagine you are in a car. The driver presses the gas pedal and the car speeds up. This is acceleration. Now, the driver presses the brake pedal and the car slows down. This is deceleration. Discuss how you feel when the car is accelerating or decelerating.

(b) A hydraulic press has pistons with areas of $0.02m^2$ and $0.1m^2$. A car weighing 5000N sits on a platform mounted on the larger piston.
(i) How much force must be applied to piston 1 to lift the car?

(ii) How far must piston 1 be pushed downward to raise the car 0.3m?



7. (a) Explain why a rotating grinder wheel becomes hot after a sudden stop.

(b) How can a charged leaf electroscope be neutralized?

(c) An object with an unknown charge is brought close to the electroscope and the leaves come closer together. Does the object have a positive or a negative charge? Explain.

8. (a) A bulb with a resistance of 5Ω is connected to an 8V battery. If the internal resistance of the battery is neglected:
(i) How much current will flow through the bulb?

(ii) How much light and heat energy does the lamp produce in one hour?

(b) (i) How do you know that a certain material is magnetic in nature?

(ii) State the law of polarity and illustrate it using sketch diagrams.

(iii) Suppose you are in the physics laboratory and you are given a bar magnet whose poles are not labelled. Describe how you could determine which end of the bar is the north pole.

9. A spherical mirror creates an image with a magnification of -1 on a screen positioned 50cm away from the mirror.

(a) Identify the type of mirror used.

(b) Calculate the distance from the image to the object.

(c) Determine the focal length of the mirror.

SECTION C (15 Marks)

Answer question number **ten (10)** in this section

10. (a) A rectangular glass block of thickness 10cm and refractive index 1.5 is placed over a small coin. A beaker filled with water of refractive index $\frac{4}{3}$ to the height of 10cm is placed over the block. Find the apparent position of the coin when viewed normally.

(b) If the eye is slowly moved away from the normal, then at a certain position the object is found to disappear due to total internal reflection. At what surface does it happen and why?

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(c) An astronomer wants to order a large concave mirror for a telescope that will produce high-quality images. Explain and advise whether the astronomer should order a spherical mirror or a parabolic mirror.

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INTERSECONDARY SCHOOLS EXAMINATION SERIES
ISESE TIME TABLE
FORM TWO PRE NECTA SERIES 01
13th July – 18th July 2026

DATE	SUBJECT(S)
13th July	HISTORY + B.STUDIES
14th July	BIOLOGY + ENGLISH
15th July	CHEMISTRY + HTM
16th July	PHYSICS + KISWAHILI
17th July	MATHEMATICS + GEOGRAPHY
18th July	COMPUTER SCIENCE

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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