MARGARET SITTA GIRLS SECONDARY SCHOOL

P.O. BOX 63

URAMBO –TABORA

PHYSICS SECOND MIDTERM EXAMINATION

TIME: 2:30hrs **FORM ONE** **August 2026**

INSTRUCTIONS TO CANDIDATES

1. This examination consists of three sections: A, B and C.
2. Answer all questions in Sections A, B and C as instructed.
3. Read each question carefully before answering.
4. Write your answers neatly and clearly.
5. Check your work before submitting the examination paper.
6. Where necessary use the following constants
   (i) Acceleration due to gravity, $g = 10 m/s^2$.
   (ii) Pie , $\pi = 3.14$

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SECTION A (15 marks)

Answer all questions

1. Choose the correct answer from the alternatives **A, B, C and D** for each question. Write the **letter of the correct answer** in the space provided.

(i) The branch of Physics that studies the motion of bodies and forces acting on them is called

A. Optics
B. Mechanics
C. Astronomy
D. Geophysics

(ii) In a scientific experiment, the factor that is **changed deliberately** is called

A. controlled variable
B. independent variable
C. dependent variable
D. constant

(iii) A block of volume 0.002 m^3 is submerged in water (density 1000 kg/m^3). What is the upthrust? (g=10 N/kg)

A. 20 N
B. 2 N
C. 200 N
D. 0.2 N
E. 0.02 N

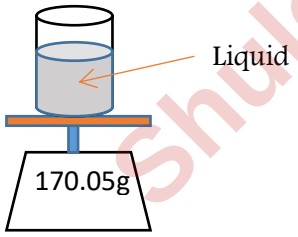
(iv) Which method is appropriate to measure the density of irregularly shaped granules like sand?

A. Using a ruler and weighing balance
B. Displacement method with water
C. Using thermometer
D. Using a hygrometer

(v) A cargo ship is designed with a hollow hull. What is the purpose of this design?

A. To reduce friction in water
B. To decrease its mass
C. To increase its density
D. To displace more water and float

(vi) The figure below shows the equipment used to determine the density of a liquid. Which formula can be used to accurately determine the density of the liquid?



A. $\frac{Mass\ of\ beaker\ and\ liquid - mass\ of\ beaker}{volume\ of\ liquid}$

B. $\frac{Mass\ of\ beaker\ and\ liquid - mass\ of\ liquid}{volume\ of\ liquid}$

C. $\frac{volume\ of\ liquid}{Mass\ of\ beaker\ and\ liquid - mass\ of\ liquid}$

D. $\frac{volume\ of\ liquid}{Mass\ of\ beaker\ and\ liquid - mass\ of\ beaker}$

(vii) What is the force acting on a book that is dropping in to the floor?

A. Gravity only
B. Gravity and air resistance
C. Air resistance
D. Friction only

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(viii) It is fact that any objects always has mass but does not always have weight. What must be present and acting on the mass for it to have weight?

A. Acceleration due to gravity
B. A set of scales for measurement
C. Displaced water in a beaker
D. Friction due to air resistance

(ix) A Vernier caliper has 1mm marks on the main scale. It has 20 equal divisions on the vernier scale which match with 16main scale divisions. For this vernier calipers, the least count is :

A. 0.02mm
B. 0.05mm
C. 0.1mm
D. 0.2mm

(x) Mass and weight ….

A. Both measure the same thing
B. Are exactly equal
C. Are two different quantities
D. Are both measured in kilogram

2. Match the items in List A with the corresponding answers in List B. Write the letter of the correct answer in the space provided. Each answer in List B may be used once, more than once, or not at all**,** as instructed.

Column A	Column B
(i) Stretching	A. Effect of magnet on iron material
(ii) Attraction	B. Force on string
(iii)Friction	C. Extension of rigid material such as spring
(iv)Viscosity	D. Two rough surface in contact
(v) Tension	E. Resistance to motion fluid

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SECTION B (70 marks)

Answer **all** questions in this section

3. An object is placed in a liquid.

(a) State the condition under which the object sinks in terms of:

(i) Forces acting on the object; **(2 mark)**

(ii) Densities of the object and liquid. **(2 mark)**

(b) State the condition under which the object floats in terms of:

(i) Forces acting on the object; **(2 mark)**

(ii) Densities of the object and liquid. **(2mark)**

(c) State the Archimedes' principle. **(2 marks)**

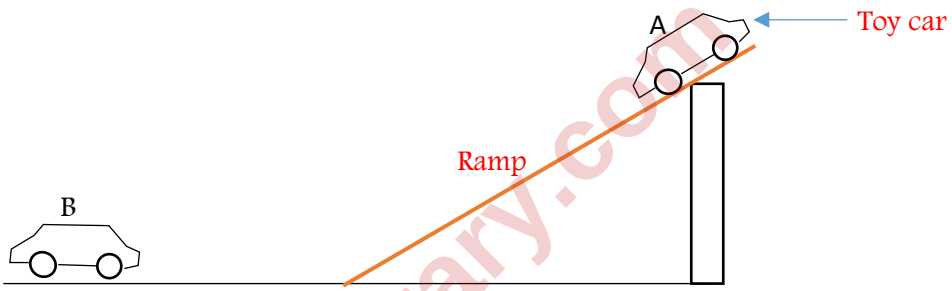
4. (a) What is scientific method? **(3marks)**

(b) Outline seven steps to be followed in writing scientific report in physics.**($3^1/_2$) marks**

(c) Use diagram to name all steps involved in a scientific investigation? **.($3^1/_2$) marks)**

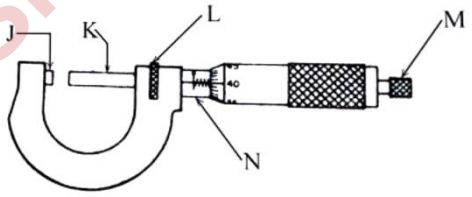
5. (a) Describe four areas where physics can be applied **(4marks)**

(b) A student is investigating how the height of ramp affects the distance of a toy car travels. The student changes the height of the ramp and measures the distance the car travels as shown in figure below.



Identify the dependent, independent, and controlled variables in this experiment. **(6marks)**

6. Study the diagram of the micrometer screw gauge and answer the questions that follow.



(a) State the purpose of the instrument shown in the diagram. **(2 marks)**

(b) Explain the function of the ratchet in obtaining an accurate measurement. **(2 marks)**

(c) Identify the parts that hold the object during measurement. **(2 marks)**

(d) State the function of the thimble. **(2 marks)**

(e) Give two physical quantities that can be measured using the instrument. **(2 marks)**

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7. Many technological developments in the modern world depend on the principles of Physics.
   (a) Define the term Technology**. (3marks)**
   (b) Explain the difference between Physics and Technology**. (3marks)**
   (c) Mention four areas where Physics is applied in everyday life.**(4 marks)**
8. (a) What is meant by a non-fundamental force? **(3 marks)**
   (b) Give three examples of non-fundamental forces and explain how each acts. **(7 marks)**
9. (a) Explain the meaning of work done by a force. **(3 marks)**
   (b) State two conditions necessary for work to be done. **(4 marks)**
   (c) Give three examples of work done. **(3 marks)**

SECTION C (15 marks)

Answer the **given** question

10. (a) During an underwater activity, a diver adjusts his equipment to achieve neutral buoyancy.
    (i) Explain the meaning of neutral buoyancy, giving two suitable example.**(5 marks)**
    (ii) Explain two applications of neutral buoyancy. **(5 marks)**
    (b) What volume of iron of density 7.8g/cm^3 must be attached to the wood whose mass is 100g and the density of 0.5g/cm^3 if both iron and the wood have to be submerged in the water

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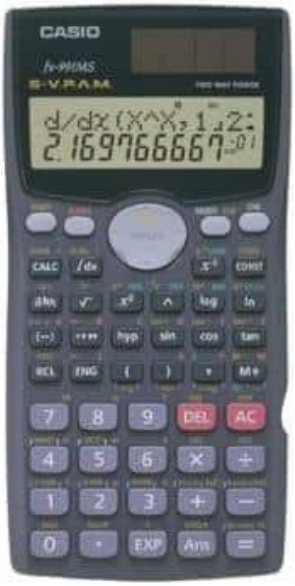

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