MKALAMA DISTRICT COUNCIL

FORM THREE TERMINAL EXAMINATION.

PHYSICS

TIME: 3 HOURS **MAY 2025**

INSTRUCTIONS

- This paper consists of section A, B and C
- Answer all questions in section A and B and only two questions from section C
- Non programmable calculator and NECTA Mathematical tables are allowed
- Where necessary use the following constants Acceleration due to gravity, g = 10 m/s^2 Density of water = 1000kg/m^3 or 1.0 g/cm^3

SECTION A (16 marks) Answer all questions from this section

1. i. If some mercury is poured on a clean glass plate small drops are formed on the glass plate. This is because
   A. mercury has high cohesion
   B. mercury has high surface tension
   C. mercury has low cohesion
   D. mercury has high adhesion

   ii. Which of the following metals can be magnetized strongly?

   A. Cobalt and iron
   B. Nickel and cobalt
   C. Steel and copper D. Brass and nickel

   iii. A machine is able to lift 200 kg of brick vertically up to a height of 30 m above the ground in 5 seconds. This implies that, power of the machine in kilowatt is

   A. 1.2
   B. 12
   C. 120
   D. 0.12

   iv. A screw jack with a pitch of 0.2 cm and a handle of length 50 cm is used to lift a car of weight 1200 N. If the efficiency of the screw is 30%, what are the velocity ratio and the effort used to raise the car respectively.

   A. 3212 and 620 N
   B. 1570 and 2.55 N
   C. 314 and 3.00 N D. 3 and 1125 N

   v. A physicist is generally interested in studying the relationship between:-
   A. Composition and decomposition of matter
   B. Physics and energy
   C. Matter and energy D. Work and energy

   vi. The following are fundamental quantities, except

   A. Length and mass

B. Volume and density
C. Luminous and temperature D. Current and time

vii. Laboratory rules are useful in

A. Making students enjoy science subject
B. Making students conduct experiments freely
C. Ensuring safety while in the laboratory
D. Ensuring good communication with other students and the teachers

viii. The force of friction between the layers of liquid is called

A. Strain
B. Surface tension
C. Elasticity
D. Viscosity

ix Pressure in liquids depends on

A. Area
B. Depth
C. Volume D. Mass

ix. As the angle between two plane mirrors increases, the number of images formed

A. Decreases
B. Increases
C. Goes to infinite
D. Remains unchanged

2. Match the item in list A with responses in list B by writing the letter of the correct response beside the item number.

LIST A	LIST B
(i)The energy which is associated with the volcanic areas. (ii) The energy due to afforestation and deforestation. (iii) Natural resources that are used in the production of electricity without damaging the environment. (iv) The energy generated by means of large propeller on tall tower (v) The energy produced by the Sun. (vi) The energy which associated with the fall of water from dam.	A. Solar energy. B. Wind energy. C. Hydroelectric energy. D. Wood energy. E. Tidal energy. F. Geothermal energy. G. Sustainable energy sources. H. Non renewable energy I. Renewable energy

SECTION B (54 marks)
Answer all questions from this section

3. (a) (i) Give two ways in which friction play an important role in daily life **(2 marks)**

(ii) State three ways in which friction can be reduced **(3 marks)**

(b) A boat heading due north crosses a wider river with a velocity of 36 m/s relative to the water. The river has a uniform velocity of 12 m/s due south.

(i) Determine the velocity of the boat with respect to an observer on the river bank **(2 marks)**

(ii) If the river was flowing due east, determine the velocity of the boat with respect to an observer on the river bank **(2marks)**

4. (a) (i) Identify two similarities between lens camera and human eye. **(3 marks)**

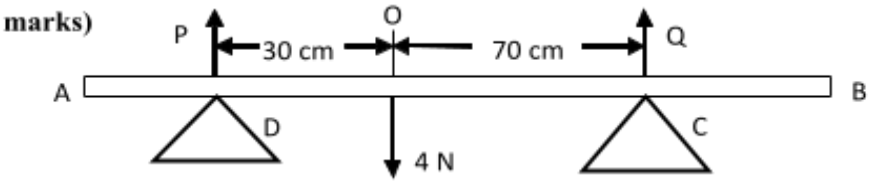
(ii)A bicycle wheel has a radius of 45cm while the rear sprocket has a radius of 4.5cm. If an effort of 160N is applied at sprocket, Calculate the maximum load that can be carried out by the bicycle system with efficiency of 80%. **(3 marks)**

(b) Mention two experiment which show the evidence that atmospheric pressure exists. **(3marks)**

5. (a) (i) Differentiate centre of gravity from centre of mass **(2 marks)**

(ii) State the principle of moment. **(2 marks)**

(b) A light beam AB rests on supports at CD. A load of 4 N is placed at O, where DO is 30 cm CO is 70 cm as shown in the figure below. Find the reactions P and Q at the supports (**5 marks)**



6. (a) What would happen when

(i) An ebonite rod is rubbed with fur**? (1.5mark)**

(ii)A class rod is rubbed with silk**? (1.5marks)**

(b)(i)Two capacitors of 20F and 25F are connected in series and then in parallel, what is the effective capacitance for each connection**?(4marks)**

(ii)Why lighting strike in zig zag pattern?(**2marks)**

7. (a)A body dipped in a liquid experiences an upthrust. Explain three factors on which the upthrust depend on**.(3marks**)

(b)(i)A ship sinks deeper in fresh water than in sea water. Justify this statement by giving one point**.(2marks**)

(ii)An object has a mass of 42g and its volume is $6cm^3$.Calculate its relative density**. (4marks)**

8. (a)(In four points describe how a magnet can be stored for effective and durable use of its magnetism**(4marks)**

(b) Explain the appearance of a red tie with blue spots when observed in

(i) red light **(2.5marks)**

(ii) green light **(2.5marks**)

SECTION C (30marks)

Answer only two (2) questions from this section

9. (a) (i) How apparent weight differ from real weight **(2 marks)**

(ii) State Archimedes' principle and law of floatation **(1 mark)**

(b) A body weighs 4.6 N in air and 3.1 N when immersed in water. The body also weighs 2.7 N when immersed in another liquid. Calculate

(i) The up thrust exerted on the body by the water **(3 marks)**

(ii) The relative density of the body **(3 marks)**

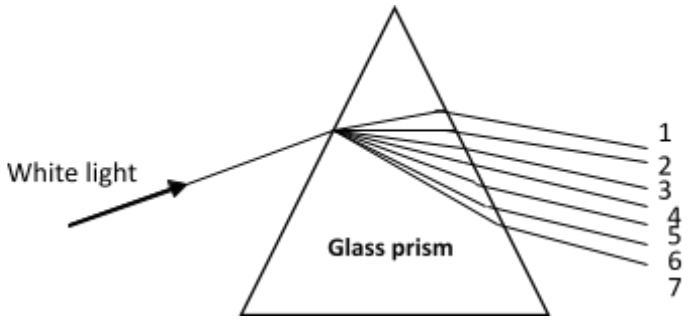
(c) The hydrometer used to measure density of liquid between 1.00 g/cm^3 to 0.80 g/cm^3. If the cross – section are of stem and height of stem are 0.5 cm^2 and 16 cm. find the volume of hydrometer below 1.00 g/cm^3 graduated. **(6 marks)**

10. (a) (i) Why convex mirrors are used as driving mirrors? Give two reasons. **(2 marks)**

(ii) Give two effects of total internal reflection of light. **(2 marks)**

(b) An object 20 cm high is placed 40 cm from a concave mirror of focal length 15 cm. Determine the position, nature and size of the image formed. **(4 marks)**

(c) The diagram below, show the dispersion of white light passing through the glass prism



Give the name of the color represented by the numbers as shown in the figure 2 above in order of decrease of wavelength. **(7marks)**

11. (a) A man was walking along the road during a cold day and hot day, when walking he observed that during a hot day the overhead electrical cables appeared loose but during cold day appeared tight however he failed to know the reason behind. Explain why these phenomena happened. **(6 marks)**

(b) An electrical technician was given a work of making a wiring in a house of five rooms. This technician was planning to connect four bulbs each room for sufficient light. By stating two reasons how you can advise this technician. **(6 marks)**

(c)Explain what happen when metallic materials are heated**?** **(3marks)**