URANGA PHYSICS EXAMINATION

Kenya Certificate of Secondary Education

232 FORM 2 PHYSICS

(Theory)

4TH EDITION (DEC. 2021, TERM 2) – TIME 2 Hours

Name: ……Adm No……Class……

School: …… Student's Signature……

Date: ……

Instructions to candidates

a) Write your **name, admission number, class** and **school** in the spaces provided above.
b) **Sign** and **Write** the date of Examination in the spaces provided above.
c) This paper consists of **two** sections; **A** and **B.**
d) Answer **all** the questions in section **A** and **B** in the spaces provided.
e) All working **must** be clearly shown.
f) **Silent non-programmable** electronic calculators may be used.
g) Students should answer the questions in **English**.

FOR EXAMINERS USE ONLY

SECTION	QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1-10	25	
B	11	11	
	12	12	
	13	11	
	14	10	
	15	11	
TOTAL SCORE		**80**	

This paper consists of 13 printed pages. Students should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

SECTION A (25 MARKS)

(Answer all questions in this section in the spaces provided)

1. Initial reading of a burette is 30.5 **cm^3.** Three drops of water each of volume 0.6 **cm^3** are added. Determine the new reading of the burette. (2 marks)

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2. **Figure 1** below shows a capillary tube dipped in mercury.

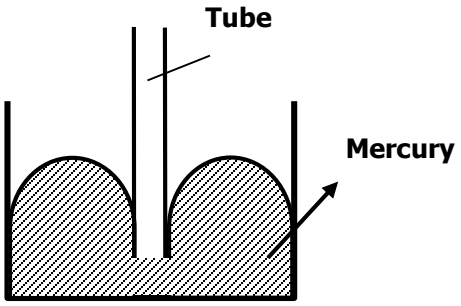

Fig. 1

i) Indicate on the diagram above the likely level of mercury in the tube. (1 mark)

ii) Explain your answer in **(i)** above. (2 marks)

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3. A man of weight 800N exerts a pressure of 200,000Pa on the ground while standing on both feet.

   (a) Calculate the area of each foot. (2 marks)

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(b) How much pressure would he exert if he stands on one foot? (2 marks)

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4. Fifteen grams of common salt were added to 1000 **cm^3** of water. After all the salt had dissolved the volume of solution was found to be 998 **cm^3**. Account for the decrease in volume of the solution. (2 marks)

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5. The set up in **figure 2** shows water being heated at the top.

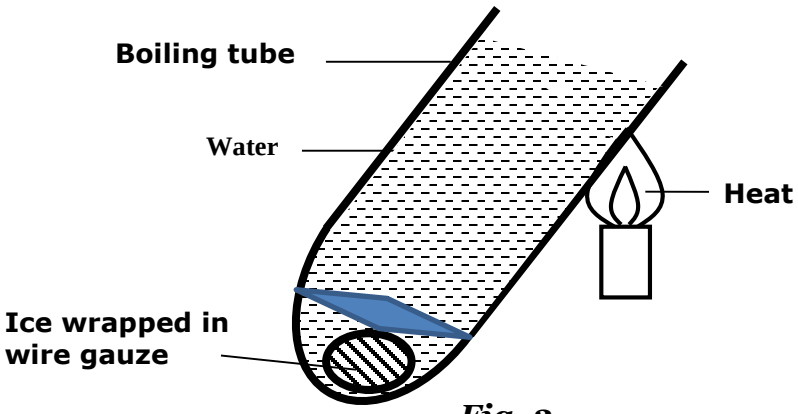

Fig. 2

State and explain the observation made after a short time. (2 marks)

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6. Explain why a dressing table mirror may become dusty if wiped with a cloth on a warm day. (1 mark)

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7. **Figure 3** shows two bar magnets **X** and **Y** and the magnetic pattern.

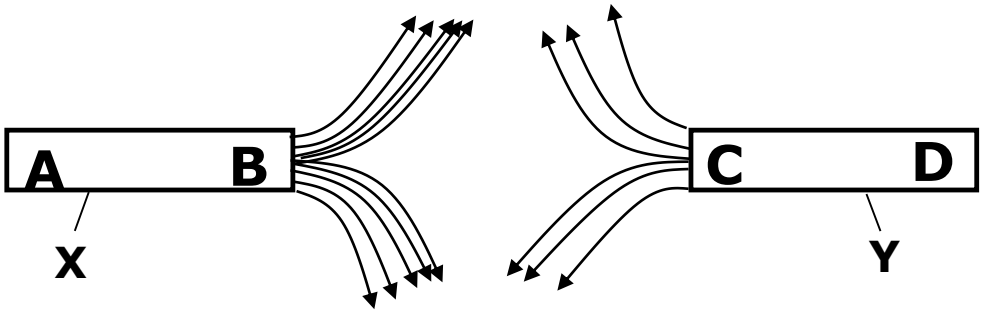

Fig. 3

i. Identify poles B and C. (1 mark)

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ii. State with a reason which magnet X or Y is stronger. (2 marks)

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8.

a) The stability of a body can be increased by increasing the base area and lowering its position of the centre of gravity. State one way of lowering its centre of gravity. (1 mark)

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b) A uniform meter rule pivoted at its centre is balanced by a force of **100N** at **20cm** and another force of **F** at the **75cm** mark as shown in **figure 4**.

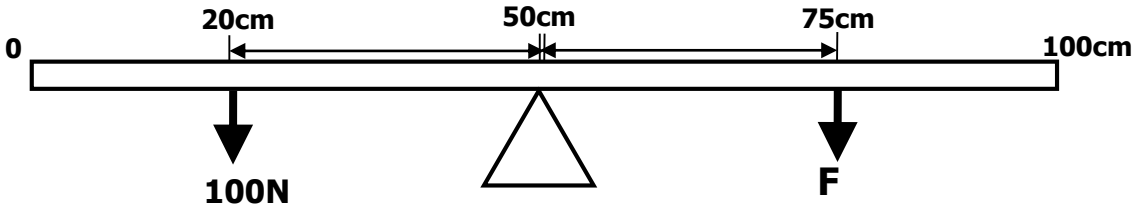

Fig. 4

Calculate the force **F.** (3 marks)

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9. State the characteristics of images formed by a pinhole camera. (2 marks)

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10. **Figure 5** shows an object placed in front of a concave mirror. Using ray diagram, **locate** the image position. (2 marks)

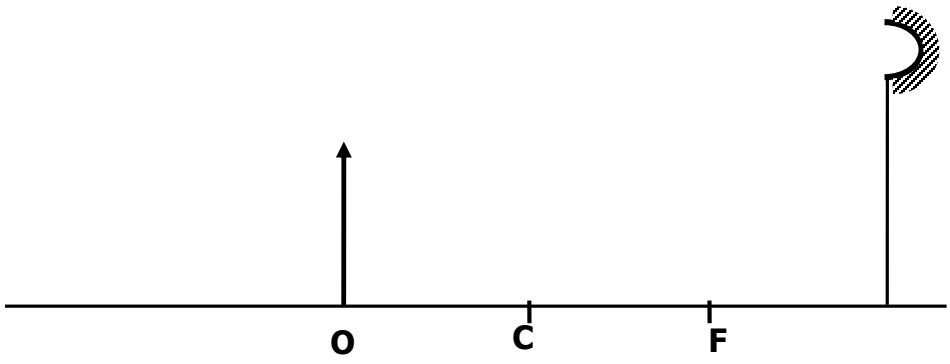

Fig. 5

SECTION B (55 MKS)

(Answer all questions in this section in the spaces provided)

11.

(a) Define the term "**electromotive force**" of a cell. (1 mark)

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(b) **Figure 6** below shows a set-up of a simple cell.

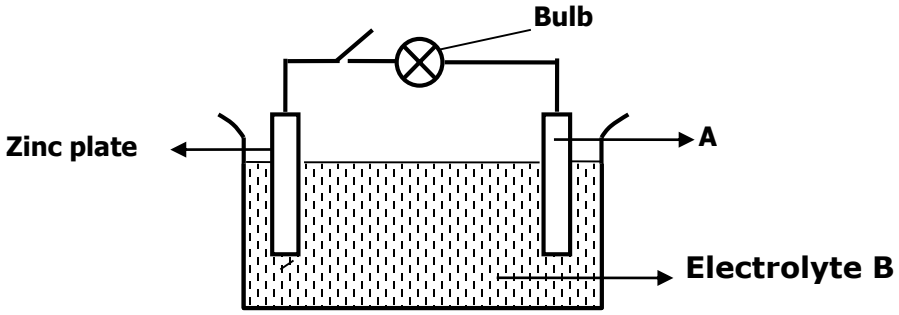

Fig. 6

I. Name the electrode **A** and the electrolyte **B**. (2 marks)

electrode **A** - …….

electrolyte **B** - ……..

II. State **two** reasons why the bulb goes off a short time. (2 marks)

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III. Give one method of minimizing the defect in **electrode A**. (1 mark)

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(c) A current of **4.8A** was passed through an electrolyte for ½ hours. **Calculate** the quantity of charge used. (3 marks)

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(d) Recharging is one of the practices of maintenance of accumulators. State two measurements, which need to be taken to help you decide when an accumulator is due for charging. (2 marks)

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12.

(a) A spherical ball bearing of mass **0.0024 kg** is held between the anvil and spindle of a micrometer screw gauge as shown in **figure 7**. The reading on the gauge when the jaws are closed without anything in between is +0.11mm.

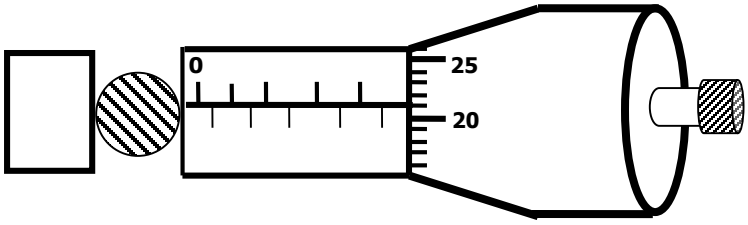

Fig. 7

i. What is the actual diameter of the ball bearing? (2 marks)

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ii. Find the density of the ball bearing in S.I units correct to 3 significant figures. (3 marks)

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(b) In an experiment to estimate the radius of oil molecule, **200** identical drops of oil of density **800kg/m^3** are run from a burette. The reading on the burette changes from **0.0cm^3** to **0.5cm^3**. One of these drops is placed on a large water surface dusted lightly using chalk dust. It spreads forming a uniform circular patch of area **0.2m^2**.

(i) What is the purpose of the chalk dust? (1 mark)

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(ii) what is the volume of one drop of oil in m^3? (1 mark)

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(iii) determine the mass of one drop of oil in kg. (2 marks)

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(iv) determine the thickness of the oil film. (2 marks)

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(v) state any **one** assumption made in the calculations in b) (iv) above. (1 mark)

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13.

(a) State the principle of moments. (1 mark)

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(b) **Figure 8** shows a uniform triangular-shaped plate.

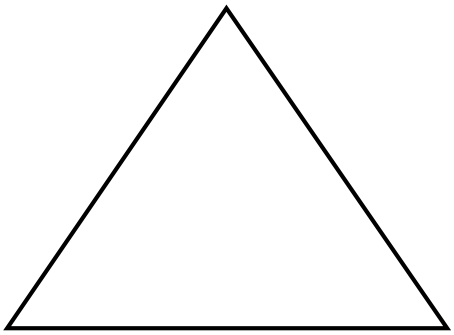

Fig. 8

Briefly describe how to locate the centre of gravity of the shape above. (2 marks)

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(c) **Figure 9** shows a wine glass.

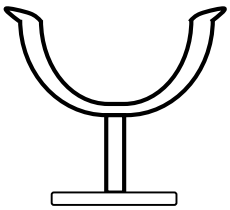

Fig. 9

I. State how the stability of the wine glass is affected if it is being filled with wine. (1 mark)

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II. **Explain** your answer in (i) above. (1 mark)

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(d) A uniform metre rule balances at the 20cm mark when a 100g mass is hang at the 0cm mark.

(i) Sketch a diagram of the balanced rule showing the two forces acting on it. (1 mark)

(ii) Calculate the weight of the rule. (3 marks)

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(iii) Calculate the reaction force (R) acting upwards on the system at the pivot. (2 marks)

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14.

(a) State the basic law of magnetism. (1 mark)

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(b) **Figure 10** below shows two bar magnets placed next to each other.

Fig. 10

Sketch the magnetic field pattern on the figure above. (2 marks)

(c) **Figure 11** shows a solenoid with a steel bar connected to a battery.

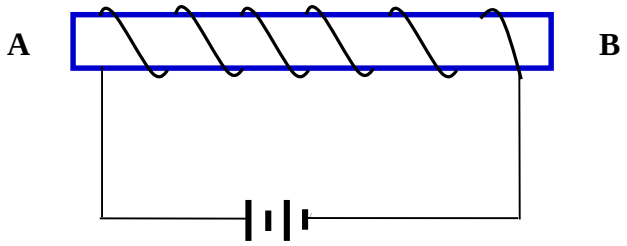

Fig. 11

(i) On the diagram indicate the current direction in the external circuit and around the solenoid. (1 mark)

(ii) Name the polarity formed at:

A…….

B……. (1 mark)

(d) Using the domain theory of magnetism, explain why:

I. The strength of a magnet cannot be measured beyond a certain point. (2 marks)

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II. The temperature increase weakens or destroys the magnetism of a magnet. (1 mark)

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(e) State **two** applications of iron as a soft magnetic material. (2 marks)

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15.

(a) Define atmospheric pressure. (1 mark)

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(b) Explain why;

(i) It is difficult to remove the lid from a preserving jar which was closed when the space above the food was full of steam. (2 marks)

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(ii) A force pump must be used instead of a lift pump to raise water from a deep well over 10m (2 marks)

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(c) The barometric height at sea level is **76cm** of mercury while that at a point on a highland is **74cm** of mercury. What is the altitude of the point? *Take g = **10N/kg**, density of mercury = **13600 Kg/m^3** and density of air as **1.25Kg/m^3**.* (3 marks)

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(d) The set up in **figure 12** shows some observation made by a form one student in their school laboratory during a physics class. **In fig. 12 (a)** bubbles were coming out of water when hydrogen gas was allowed to flow over the porous pot whereas, **fig. 12 (b**) shows water having risen through the tube.

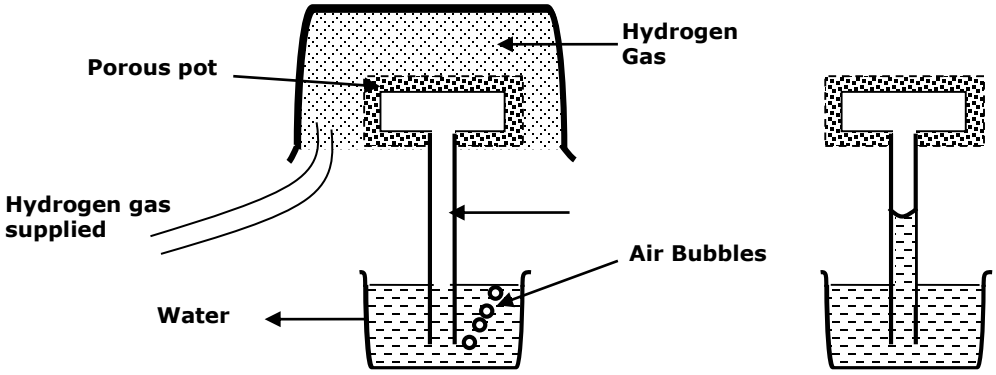

Fig. 12 (a) ***Fig.12 (b)***

Fig. 12

(i) What was the lesson investigating? (1 mark)

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(ii) Briefly explain the observation made in **Fig. 12 (a).** (1 mark)

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(iii) Name any **one** factor that would affect the observation made in the experiment set up, in figure 12 above. (1 mark)

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