



URANGA PHYSICS EXAMINATION

Kenya Certificate of Secondary Education

232

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FORM 1 PHYSICS

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Paper

4TH Edition - Feb. 2022

TIME 2 Hours

Name School:

Class Adm. Number Candidate's Signature

Date

Instructions to candidates.

- (i) Write your **name, school, class** and **admission number** in the spaces above.
- (ii) **Sign** and **write** the date of examination in the spaces provided above.
- (iii) This paper consists of **two** sections; **A** and **B**.
- (iv) Answer **all** questions in this paper in the spaces provided
- (v) All working must be clearly shown in the spaces provided in this booklet.
- (vi) All **numerical answers** MUST be expressed in **decimal notation**
- (vii) KNEC Mathematical tables and silent NON -PROGRAMMABLE CALCULATORS may be used.
- (viii) **Candidates should answer the questions in English**

For Examiner's Use Only

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1 - 12	25	
B	13	11	
	14	12	
	15	07	
	16	11	
	17	13	
TOTAL SCORE		80	

The paper consists of 12 printed pages.

Candidates should check the question paper to ensure that all the pages are printed as indicated and no questions are missing.

SECTION A (25 Marks)

Answer all the questions in this section in the spaces provided

1. (a) Name **two** causes of burns in the laboratory **(2 marks)**

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- (b) What first aid measure may be administered in case of a burn? **(1 marks)**

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2. The level of water in a burette is at 30 cm³. 400 drops of water each of volume 0.015 cm³ was removed from the burette. Determine the new level of water in the burette **(3 marks)**

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3. State the SI unit of density **(1 mark)**

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4. Give a reason why heat transfer by radiation is faster than heat transfer by conduction **(1 mark)**

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5. An object weighs 7N on earth where acceleration due to gravity is 10N/kg. Find the acceleration due to gravity on another planet where the same object weighs 5N. **(2 marks)**

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6. a) What is surface tension?

(1 mark)

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b) Figure 1 shows a funnel dipped into a liquid soap solution.

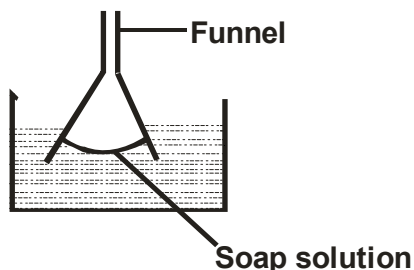


Figure 1

Explain what happens to the soap bubble when the funnel is removed from the soap solution (2 marks)

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7. Two identical spring balances A and B each weighing 0.8N are arranged as shown in figure 2 below.

What are the readings of A and B?

(2 marks)

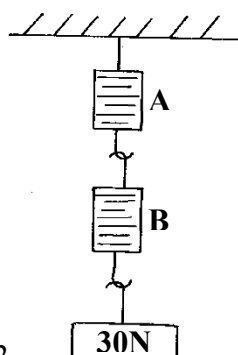


Figure 2

8. a) The diagram in figure 3 below shows water drops being placed slowly on two surfaces.

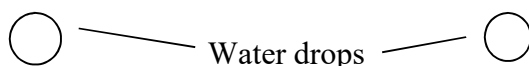


Figure 3



Draw the two surfaces with water drops on them.

(2 marks)

b). Explain the appearance of the drop on the two surfaces.

(2 marks)

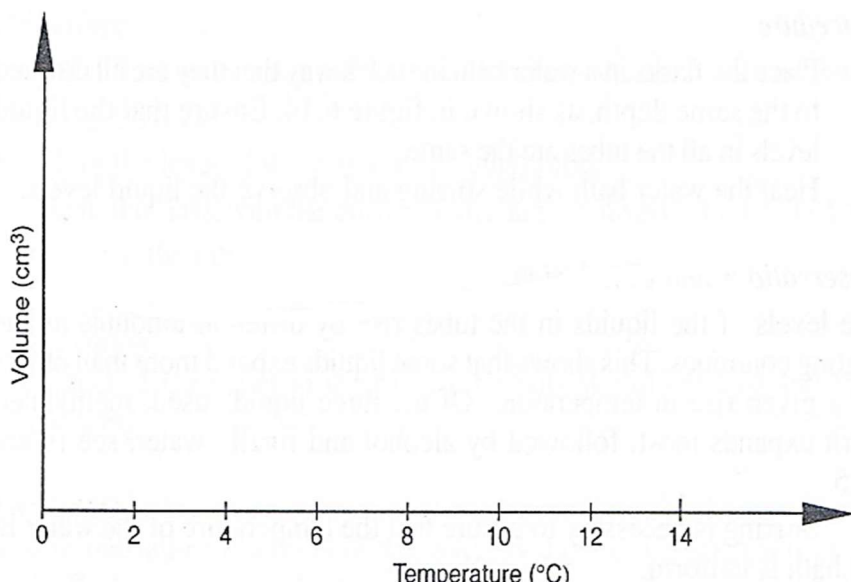
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9. On the axis provided, sketch the graph which shows the relationship between volume V , and temperature of a fixed mass of water in the temperature range 0°C to 14°C (1 mark)



10. Explain why in construction, concrete beams are reinforced with steel.

(2 marks)

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11. Give an example of a case where physics technology is used in medicine

(1 mark)

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12. Convert each of the following temperatures to the temperature scale indicated in brackets (2 marks)

a) 27°C (convert to K)

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b) 473 K. (convert to $^{\circ}\text{C}$)

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SECTION B (55 marks)

Answer ALL the questions in this section in spaces provided

13. a) A smoke cell contains a mixture of trapped air and smoke. The cell is brightly lit and viewed through a microscope. State and explain what is observed. **(3 marks)**

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- b) When the stopper is removed from a bottle containing liquid ammonia, the ammonia can be smelled in all parts of the room after a short while. Explain this observation. **(2 marks)**

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- b) State two factors that affect the rate of diffusion in gases. **(2 marks)**

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- c) Figure 4 below shows apparatus used to compare the rates of diffusion of gases.

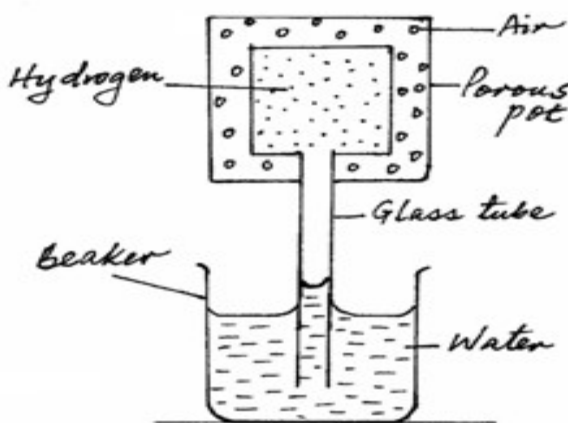


Figure 4

- Water is observed to rise up the glass tube. Explain this observation. **(2 marks)**

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d) A beaker is filled completely with water. A spoon full of common salt is added slowly. The salt dissolves and the water does not overflow.

- (i) Why is salt added slowly? (1 mark)

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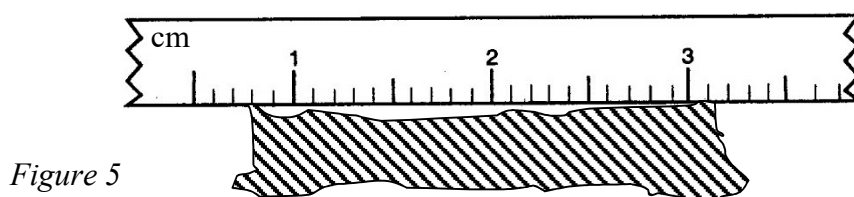
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- (ii) State the reason why water does not overflow. (1 mark)

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14. (a) The length of a piece of wood is measured with an instrument as shown in figure 5 below.



- i. State the accuracy of the instrument (1 mark)

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- ii. Determine the length of the piece of wood. (2 marks)

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(b) Complete the table below by converting the given quantity into the stated units. Show your working

hours	minutes	seconds
		28,800

(2 marks)

(c) A sheet of paper measures 25 cm by 15 cm. Calculate its areas in SI units (2 marks)

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- (d) Three immiscible liquids of density $A = 0.7\text{g/cm}^3$, $B = 0.8\text{g/cm}^3$ and $C = 0.65\text{g/cm}^3$ are mixed together in a measuring cylinder and allowed to settle. Draw and label the liquids in the measuring cylinder. **(2 marks)**

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- (e) Water of density 1 g/cm^3 and volume 2 cm^3 is mixed with milk of density 2.4 g/cm^3 . If the resulting mixture has density 1.9 g/cm^3 , determine the mass, m and volume, v of milk in the mixture. Give your answer in g and cm^3 **(3 marks)**

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15. (a) The diagram in figure 6 below shows a set up used by a student to show variation of pressure in a liquid. The thistle funnel is wrapped with an elastic membrane. Use it to answer the question that follow.

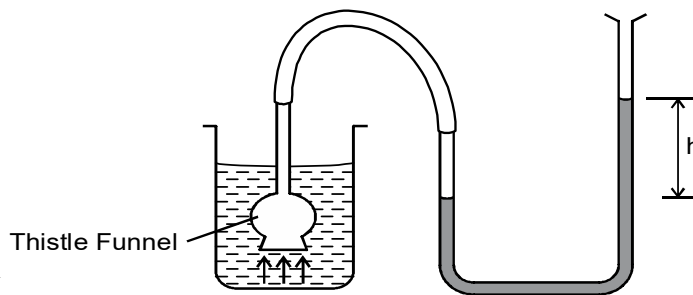


Figure 6

State and explain the effect on the height, h , when the thistle funnel is moved upwards towards the surface of the liquids. **(2 marks)**

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(b) Two immiscible liquid water and liquid L are put in a U tube as shown in figure 7 below.

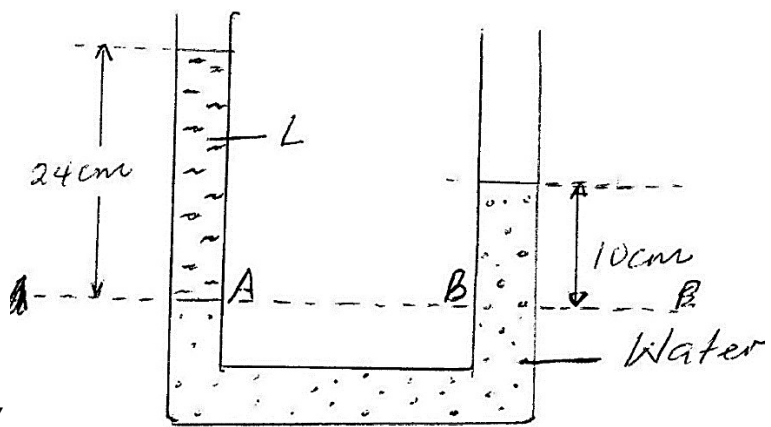


Figure 7

Use the diagram to find;

a) Pressure at B (2 marks)

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b) Pressure at A. (1 mark)

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c) Density of liquid L. (2 marks)

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(c) Explain why it is difficult to remove the lid from preserving jar which was closed when the space above the food was full of steam (2 marks)

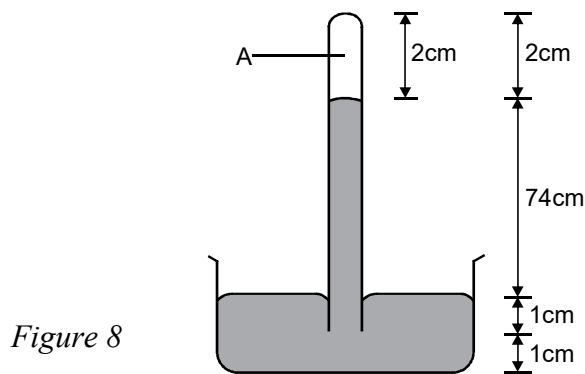
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(d) Figure 8 below shows a simple barometer.



- (i) What name is given to region A? (1 mark)

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- (ii) What keeps the mercury in the tube? (1 mark)

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- (iii) What is the value of the atmospheric pressure being shown by the barometer? (1 mark)

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- (iv) What would happen to the reading if the barometer was taken up a high mountain? (1 mark)

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- (v) Give a reason for (d) above. (1 mark)

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- (vi) State what would be observed if the test tube is tilted assuming the instrument is functioning normally. (1 mark)

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16. In an experiment to determine the density of sand using a density bottle, the following measurement were recorded:

Mass of empty density bottle = 43.2 g

Mass of density bottle full of water = 68.2g

Mass of density bottle with some sand = 67.5g

Mass of density bottle with the sand filled up with water = 82.3g

Take the Density of water to be 1 g/cm³

Use the above data to determine the:-

a) Mass of water that completely filled the bottle (½ mark)

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b) Volume of water that completely filled the bottle. (1 mark)

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c) Mass of sand (½ mark)

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d) Mass of water that filled the space above the sand. (½ mark)

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e) Volume of the sand (1½ marks)

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f) Density of the sand (1 marks)

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17. (a) The set up in figure 9 below was used by form 1 students to investigate one of the modes of heat transfer.

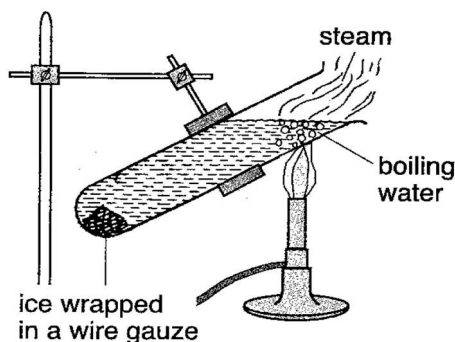


Figure 9

(i) State the mode of heat transfer being investigated (1 mark)

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(ii) It's observed that the water boils at the top of the boiling tube but the ice wrapped in wire gauze does not melt. explain (1 mark)

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(iii) Why is ice wrapped in a wire gauze? (1 mark)

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(b) Ice at 0°C is stored in a thermos flask placed in a relatively warm room and after some time, it is noted that the temperature of the ice does not change

(i) What is the role of the silvery surface in keeping the ice cold? (1 mark)

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(ii) What feature of a thermos flask prevents heat transfer by radiation? (1 mark)

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(iii) What modification can be made on the cork lid of the thermos flask to prevent heat loss through it (1 mark)

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(c) Using the idea of particles, differentiate between solid and liquid in terms of intermolecular distance.

(2 marks)

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(d) Why are solids better conductors of heat than liquids (1 mark)

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(e) The rate of heat flow in thermal conductivity increases with increase in cross-section area of the conductor. Explain this observation. (1 mark)

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(f) Name two adaptations that can be made to a mercury thermometer to make it more sensitive (2 marks)

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