NAME _____INDEX NO._____

SCHOOL _____ SIGNATURE _____

DATE _____

232/1
PHYSICS
PAPER 1
(THEORY)
JULY / AUGUST, 2019
TIME: 2 HOURS

LARI SUB COUNTY JOINT EXAMINATION

Kenya Certificate of Secondary Education (K.C.S.E)

232/1
PHYSICS
PAPER 1
(THEORY)
TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

1. Write your name, school and index number in the spaces provided above.
2. Sign and write the date of the examination in the spaces provided above.
3. The paper consists of two sections, Section **A** and **B**.
4. Answer **ALL** the questions in section A and B in the spaces provided.
5. **ALL** answers and working **MUST** be clearly shown.
6. Mathematical tables and electronic calculators **may be** used.

FOR EXAMINER'S USE

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1–11	25	
B	12	11	
	13	12	
	14	10	
	15	10	
	16	12	
TOTAL SCORE		80	

This paper consists of 12 printed pages.
Candidates should check to ensure that all pages are printed as indicated and no questions are missing

SECTION 1 (25 MARKS)

1. Figure 1 below shows two flasks with equal amount of water heated at the same rate.

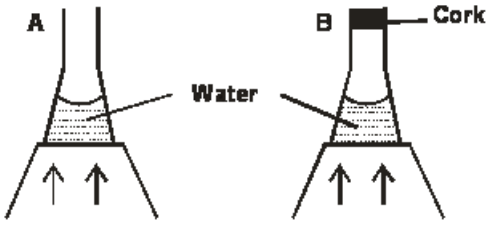

Fig 1

State and explain which water boils first. (2 marks)

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_____

_____

2. a) What is surface tension? (1 mark)

_____

_____

b) Figure 2 shows a funnel dipped into a liquid soap solution.

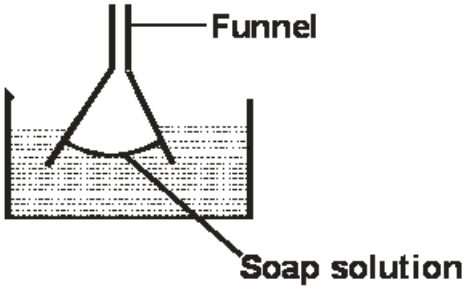

Fig 2

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

_____

_____

_____

3. a) Distinguish between distance and displacement. (1 mark)

_____

_____

b) Figure 3 shows the pattern formed on a tape in an experiment to determine acceleration of a trolley moving from A to Q. The frequency of the ticker tape is 100Hz.

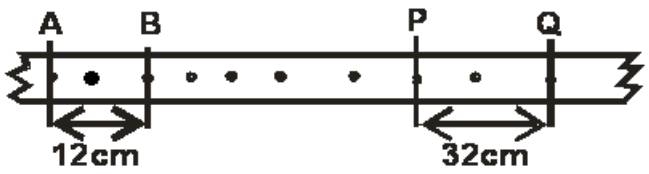

Fig 3

Calculate the acceleration of the trolley. (3 marks)

_____

_____

_____

4. Explain why fish can survive under water when the surface is already frozen. (1 mark)

_____

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5. Figure 4 shows a pith ball at the bottom of a bottle container.

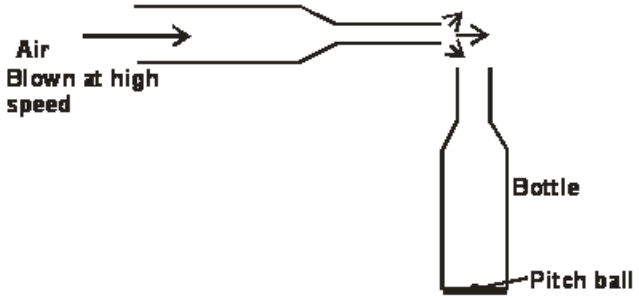


Fig 4

State and explain what happens if air is blown over the mouth of the container. (2 marks)

_____

_____

_____

6. A 150g mass tied on a string is whirled in a vertical circle of radius 30cm with a uniform speed. At the lowest position the tension in the string is 9.5N.Calculate the velocity of the mass. (3 marks)

7. Figure 5 shows a liquid being siphoned from a beaker to another.

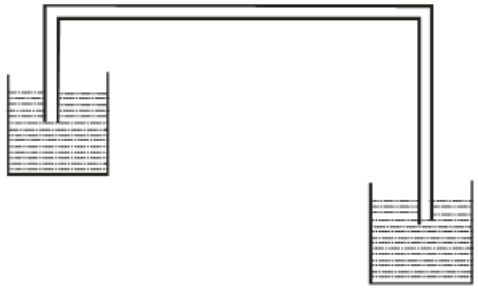


Fig 5

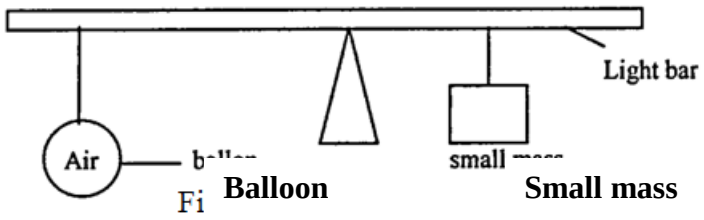
a) Indicate on the diagram the direction of flow of the liquid. (1 mark)

b) Explain what would happen to the flow of the system if it was put in a vacuum. (2 marks)

8. A bullet of mass 20g moving with a velocity of 30m/s penetrates a sand bag and it's brought to rest in 0.05 seconds. Find the average retarding force of the sand. (3 **marks**)

9. Explain why an iron gate feels colder when touched but its wooden gatepost feels warm at night. 1mk

09. The system in the figure below is in equilibrium at room temperature. The system is taken outside where the temperature is 10^0C higher for some time.



Fi **Light bar** **Balloon** **Small mass**

Explain why it tips to the right when it is taken outside the room. (2 **marks**)

_____

_____

_____

_____

10. State **one** way of increasing sensitivity of mercury in glass thermometer. (1**mark**)

_____

_____

SECTION B (55 MARKS)

11. a) State the energy transformation that occurs when a ball is kicked vertically upwards. (2 marks)

b) Figure 7 shows a lever system.

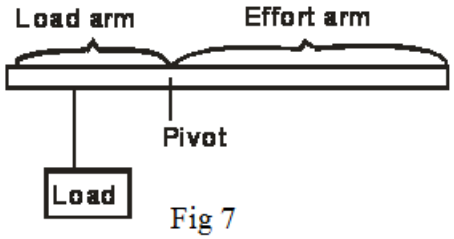


Fig 7

Suggest **one** way in which the velocity ratio could be increased. (1 marks)

c) Figure 8 shows part of a bicycle.

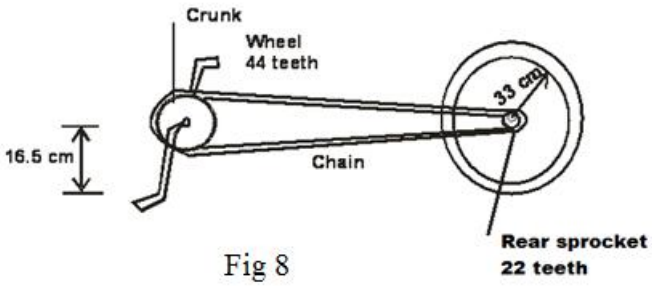


Fig 8

Determine:

i) The velocity ratio. (3 marks)

ii) Efficiency of the bicycle if its mechanical advantage is 0.15. (3 marks)

d) State **two** reasons why the efficiency of a machine is always less than 100%. (2 marks)

12. a) State **two** differences between boiling and evaporation. (2 marks)

b) A certain powder of mass 0.01kg was heated in a container by an electric heater rated 50W for some time. The graph in figure 9 shows the variation of the temperature of the powder with time.

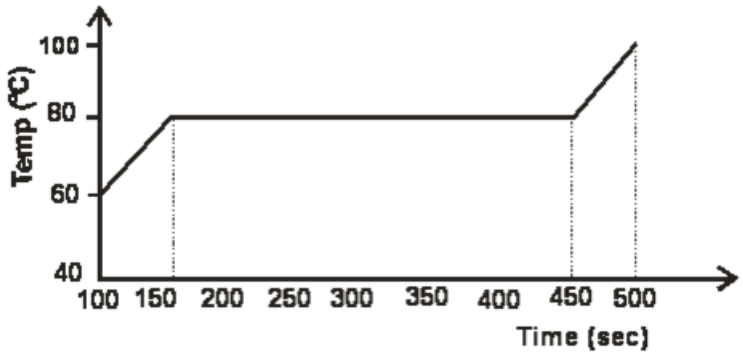


Fig 9

Use the graph to determine:

i) Melting point of the powder. (1 mark)

ii) Quantity of heat supplied by the heater from the time the powder starts to melt to the time it has all melted. (3 marks)

iii) Specific latent heat of fusion of the powder assuming the container absorbs negligible amount of heat. (3 marks)

c) An electric heater takes 4 minutes to heat some water to boiling point. How long would it take if the current flowing through it is doubled? (3 marks)

13. a) The figure below shows a block of mass 25g and density 200kg/m^3 submerged in a certain liquid and suspended from a homogenous horizontal beam by means of a thread. A mass of 2kg is suspended from the beam as shown in the figure below.

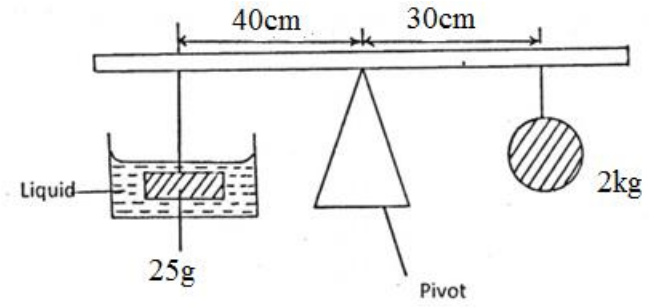


Fig 10

i) Determine the upthrust force acting on the block. (3 marks)

ii) Calculate the density of the liquid. (3 marks)

b) The diagram shows an experiment to investigate the relationship between volume and temperature of a fixed mass of gas at constant pressure.

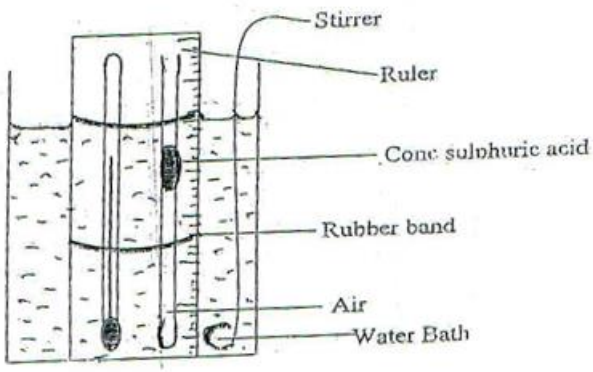


Fig 11

i) Explain the function of;
(I) Concentrated sulphuric acid (1 Mark)

_____

_____

(II) Stirrer (1 Mark)

_____

_____

ii). Explain how the set up above can be used to verify Charles law for an ideal gas (2 Marks)

_____

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_____

_____

14. The diagram below shows a six's maximum and minimum thermometer.

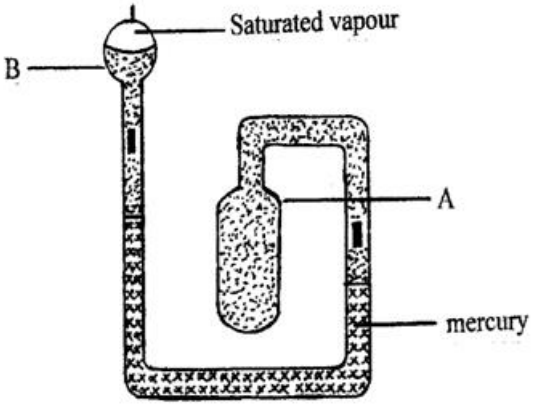

Fig 12

a) What is the thermometric liquid in this thermometer? (1**mark**)

_____

b) Why is it necessary for the vapour in bulb B to be saturated? (1 **mark**)

_____

_____

c) Explain how the thermometer indicates maximum and minimum temperature. (3 **marks**)

_____

_____

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_____

d) Indicate on the diagram the two points where the reading of the temperature shown by the thermometer can be made. (2 **marks**)

e) A faulty mercury thermometer reads 12^0C when dipped into melting ice. When in steam at normal atmospheric pressure it reads 92^0C. Determine the reading of this thermometer when dipped into a liquid of 20^0C. (3marks)

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15. a) The figure below shows a velocity – time graph for the motion of a certain body.

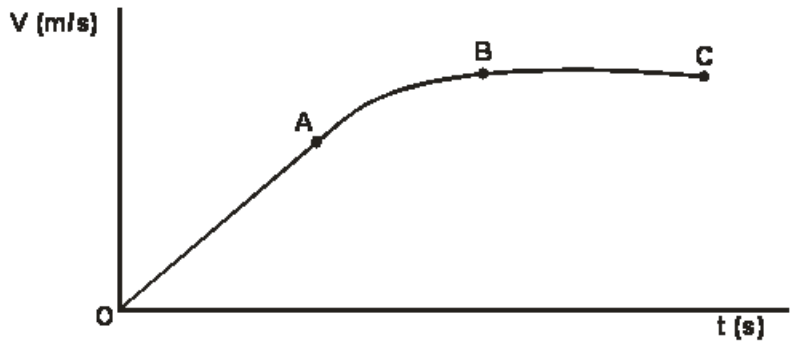

Fig 13

Describe the motion of the body in the region:

i) OA: (1 **mark**)

ii) AB: (1 **mark**)

iii)BC: (1 **mark**)

b) A car moving initially at 10m/s decelerates at 2.5m/s^2

Determine:

i) I) Its velocity after 1.5seconds. (2 **marks**)

II) The distance travelled in 1.5 seconds. (2 **marks**)

II) The time taken for the car to stop. (2 **marks**)

III) Sketch the velocity – time graph for the motion of the car up to the time the car stopped.(1 **mark**)

IV) From the graph determine the distance the car travelled before stopping. (2 **marks**)

-END-