NAME_____ CLASS_____

DATE _____ SIGNATURE _____

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PHYSICS
FORM FOUR
1ST TERM 2016
2 HRS.

Kenya Certificate of Secondary Education
PHYSICS PP1
FORM FOUR 1ST TERM EXAMINATION 2016

INSTRUCTIONS

- *Write your name and your class in spaces provided*
- *This paper consists of two sections, section A and section B*
- *Answer all the questions in each section in the spaces provided .*
- *Mathematical tables and Electronic calculators may be used*
- *All working must be Cleary shown where necessary*

For Examiner's Use Only

Section	Maximum score	Candidates score
A	25	
B	55	
Total	80	

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

ANSWER ALL QUESTIONS IN THIS SECTION IN THE SPACES PROVIDED

1.   *Figure 1* below shows part of the micrometer screw gauge. Study it and use it to answer the question that follow
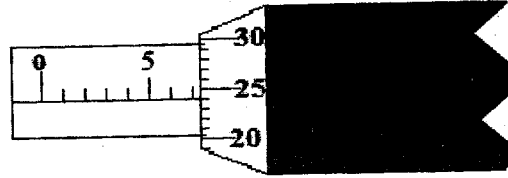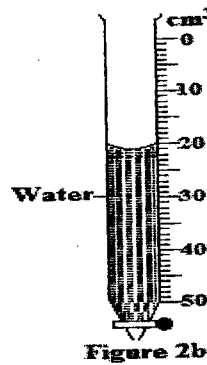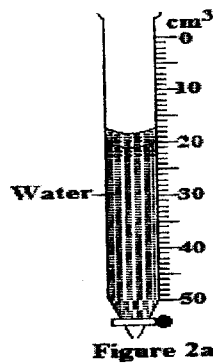

Figure 1

Write down the reading shown by the micrometer screw gauge shown in *figure 1*
(1 mark)

2.   *Figure 2* (a) shows the initial reading of a burette used to determine the volume of one drop of oil. After 50 drops of oil were run the final reading were as shown in *2(b)*

Figure 2a   **Figure 2b**

Determine the volume of one drop of water   (2 marks)

3.   Apart from gravitational force , state two factor that determine the pressure at a point of a liquid.   (2 marks)

_____

_____

4. A student placed a steel nail on a soft ground on its sharp end and on its blunt head as shown in *figure 3 (i) and (ii)* respectively. He then placed a 50N force on each of the nail. Study the diagram and answer the questions that follow
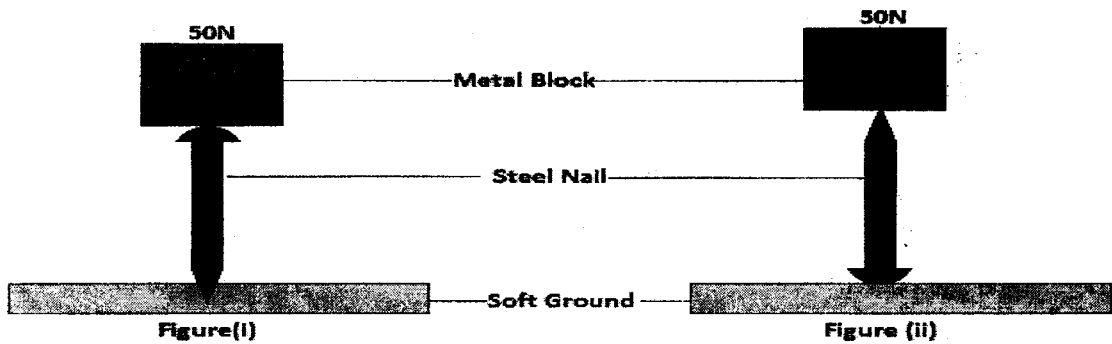
Figure(i)   Figure (ii)

State and explain the observations in the figure (i) and (ii)   (3 marks)

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5. *Figure 4* shows the arrangement of molecules in the three states of mater. Study the diagram and answer the questions that follow

State 1   State2   State 3
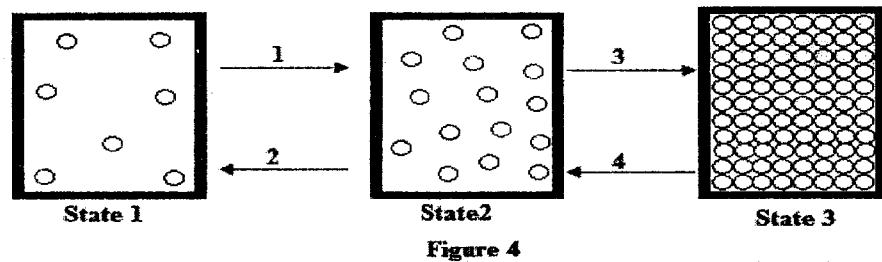
Figure 4

a) Name the process marked **1**   (1mark)

_____

b) State the reason for the arrangement of molecules in **state 3**   (1 mark)

_____

_____

6. Give a reason why concrete walls can be reinforced using steel without cracking
                                                                        (1 mark)

_____

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7.   **Figure 5** a meter rule balanced horizontally by two forces placed at its ends. use the diagram to answer the questions that follow

Figure 5
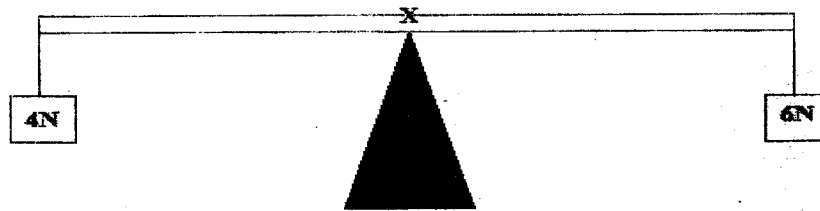
Determine the position X where the pivot should be placed for the system to be at equilibrium   (3 marks)

8.   **Figure 6** shows water placed in a large trough and two pipes A and B of same cross-section area are dipped into the water.
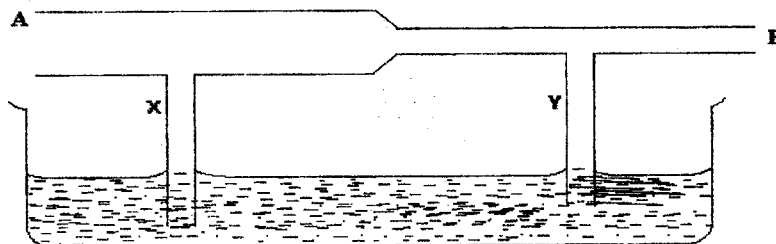

Figure 6

Air is then blown from side **A** to **B** at high velocity. On the same diagram, show the level of water in pipes **X** and **Y**   (2 marks)

9.   Give a reason why car tyres that have treads are better for use on a slippery road
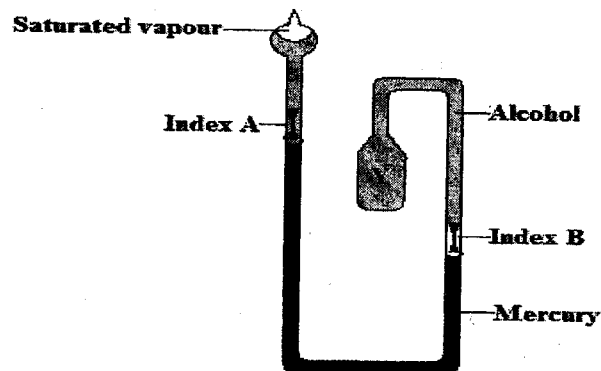   (1 mark)

_____

_____

10. **Figure 7** thermometers T_1 and T_2 inserted into equal volumes of hot water in metallic container of which one is shinny and the other surface is dull as shown in figure (i) and (ii) . study the diagram and answer the question that follow

Figure 7
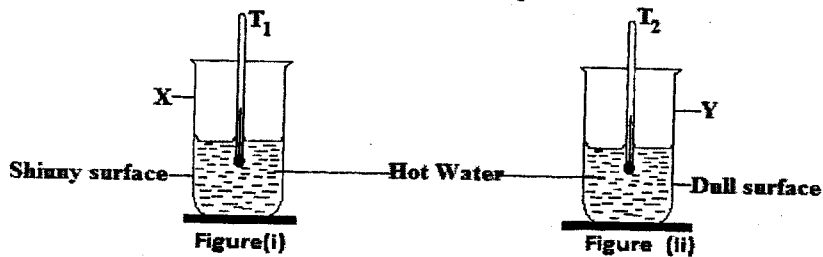
State and explain the difference in the readings on the thermometers T_1 and T_2 after the liquids were allowed to cool for some time   (2 marks)

_____

_____

_____

11. State the immediate action that needs to be taken in the laboratory in case of electric fire   (1 mark)

_____

_____

12. **Figure 8** shows Six's maximum and minimum thermometer. Study the diagram and use it to answer the questions that follow

Figure 8

a) Which index records the maximum temperature of a day?   (1 mark)

_____

b) State two advantages of using alcohol over mercury for this thermometer   (2 marks)

_____

_____

_____

13. **Figure 9** shows the level of mercury and water in capillary tubes of same cross-section area. Use the diagram to answer the question that follow
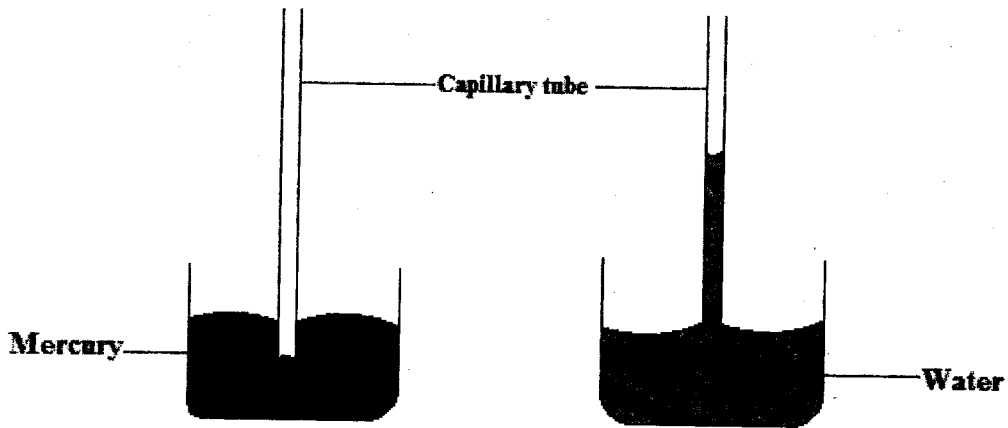

Figure 9

Explain the difference in the level of the liquids in the capillary tubes   (2 marks)

_____

_____

_____

SECTION B(55 MARKS)
ANSWER ALL QUESTIONS IN THIS SECTION IN THE SPACES PROVIDED

14.a)   Explain why a body travelling at constant speed along a circular path is said to be accelerating   (2 marks)

_____

_____

_____

b)   State **two** important factors to be considered when setting the banking angle of a road.
                                                                                        (2marks)

_____

_____

c)   A ball of mass 4kg is whirled at the end of a string in a horizontal circular path at a Speed of 10ms⁻¹. if the string is 4.0m long, determine:

i)   The angular velocity of the **stone.**   (3marks)

ii)   The tension in the string.   (3marks)

d)   Apart from banking of roads, state any two applications of uniform circular motion
                                                                          (2 marks)

_____

_____

15.   **Figure 10** shows a bulb hydrometer floating with a height h above the surface of water.
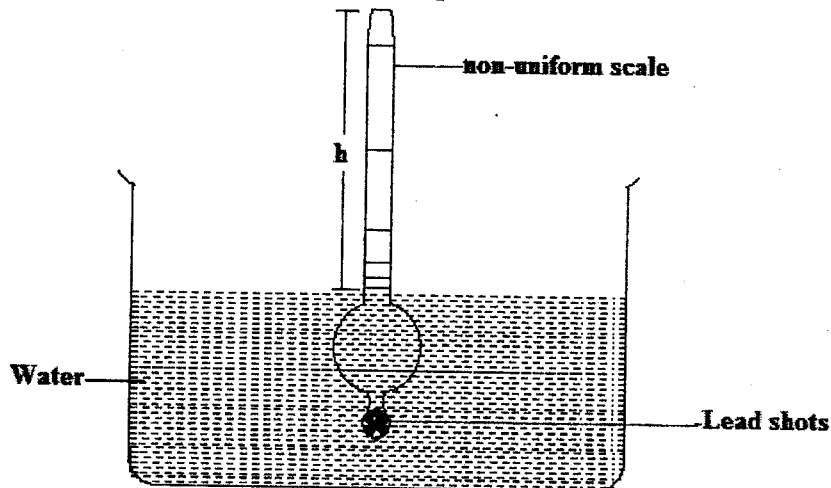   Study the diagram and answer the questions that follow

Figure 10

a)   State the principle used in the working of the hydrometer.   (1mark)

_____

b)i)   Explain why:
I)   The stem is narrow   (1mark)

_____

II)   The bulb is wide.   (1mark)

_____

_____

III)   The non-uniform scale   (1mark)

_____

ii)   State and explain the change in the height **h** when the hydrometer it is transferred into a liquid of higher density   (2 marks)

_____

_____

iii)   One common hydrometer is a lactometer. State the function of a lactometer   (1 mark)

_____

c)   *Figure 11* shows a solid block of mass 75g floating in water with a third of its volume immersed in water. Study it and answer the questions that follow
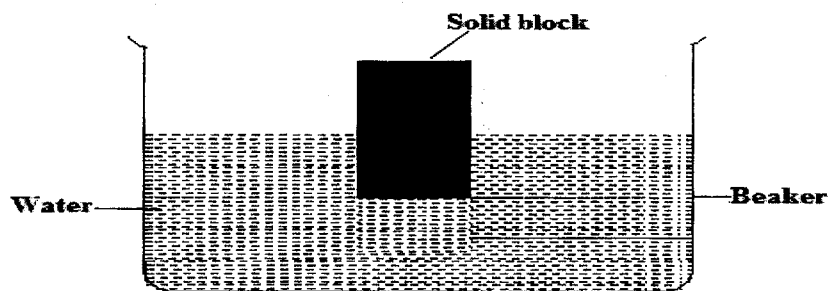

Figure 11

Determine the;

i)   Upthrust of water on the solid block   (2 marks)

ii)   The total volume of the solid block   (3 marks)

iii)   The density of the solid block   (2 marks)
       (Take density of water =1g/cm³)

16.a) Define the term specific latent heat of vaporization.   (1mark)

_____

_____

b) **Figure 12** shows a set up by a student to determine the specific latent heat of vaporization of a liquid.

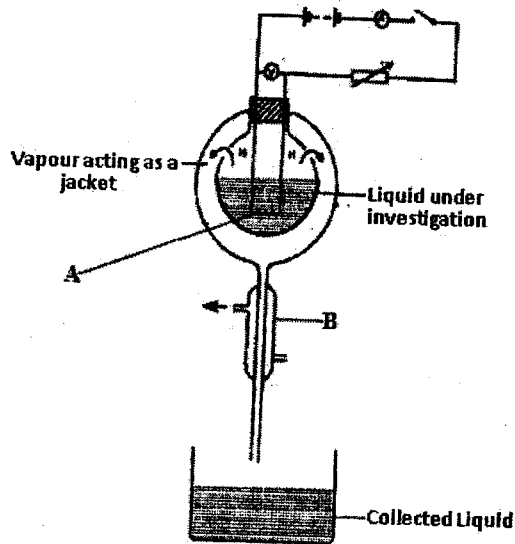Figure 12

i) Identify the parts labeled **A** and **B**

   A   (2marks)

   B

ii) State the purpose of the rheostat in the set-up   (1 mark)

_____

_____

c) The following readings were obtained from the experiment
Voltage =240V
Current=13 amps
Time =5 minutes
Mass of the liquid collected=414g

From the experimental results, determine:

i) Quantity of heat supplied by the heater   (3 marks)

ii) The specific latent heat of vaporization of liquid X   (3 marks)

iii)   State one source of error in the experiment   (1 mark)

_____

_____

d)   **Figure 13** shows a cross-section area of a refrigerator. Study the diagram and answer the
     questions that follow

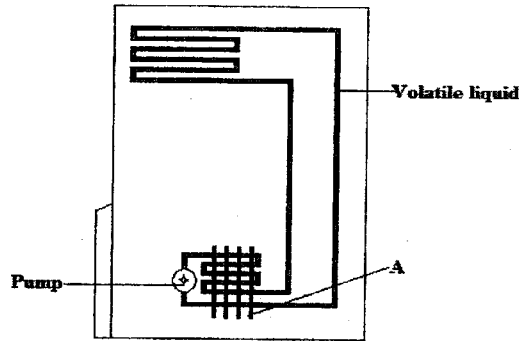
Figure 13

i)   Name the part labeled **A**   (1 mark)

_____

_____

ii)   State the function of the following parts
I)   The compressor pump.   (1mark)

_____

_____

II)   The volatile liquid.   (1mark)

_____

_____

17.   **Figure 14** shows a trolley moving on a frictionless horizontal bench of height 125cm with
      a solid block placed on top of the trolley. The trolley strikes the barrier at the edge of the
      bench and the solid block flies off on impact and lands on the ground 2.5m from the edge
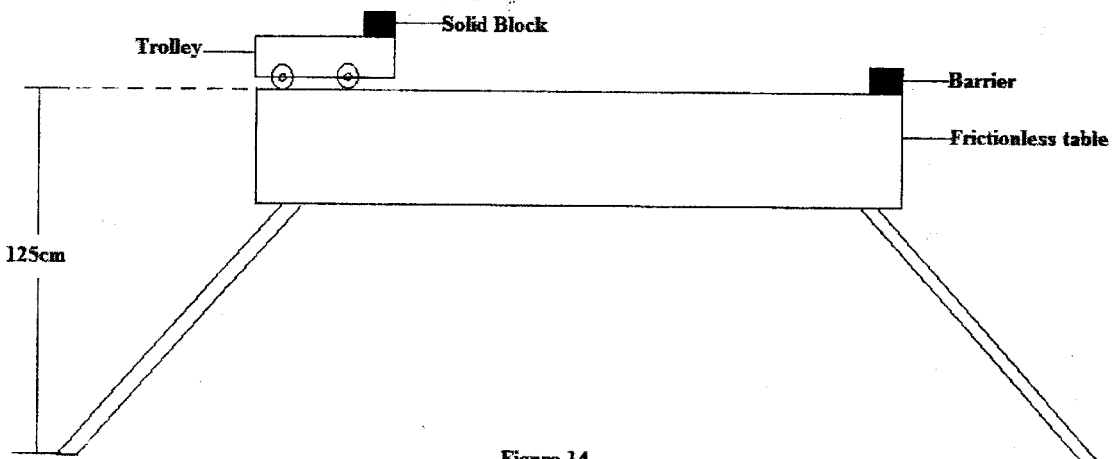   of the bench. Use the diagram to answer the questions that follow

Figure 14

a)   Give a reason why the solid block flies off as the trolley strikes the barrier   (1 mark)

_____

_____

b)   Determine:-
i)   The time taken by the brass mass to reach the ground.   (2marks)
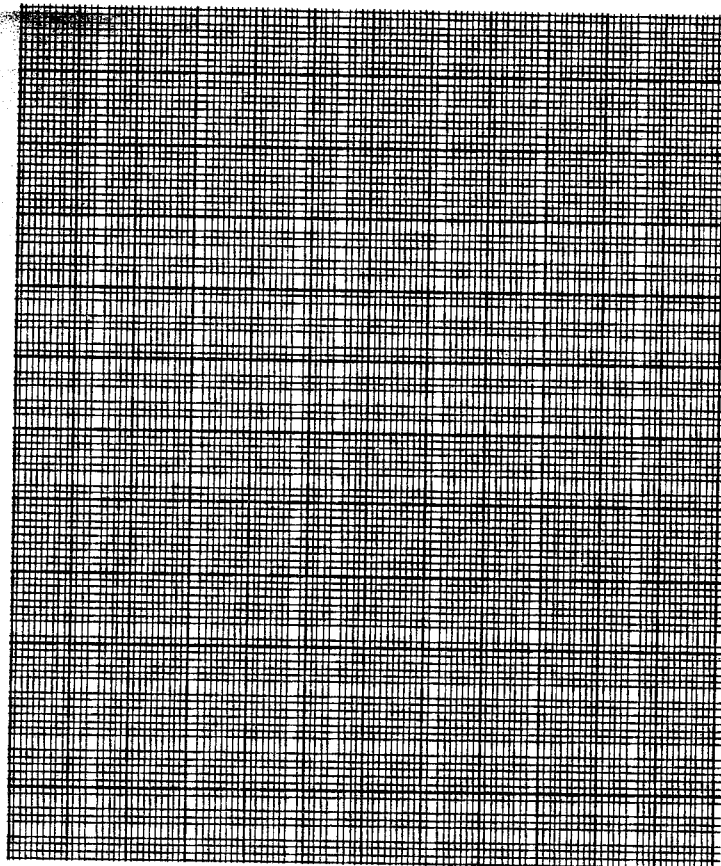

ii)   The speed at which the trolley struck the barrier.   (2marks)

c)   Draw a diagram to show how a single pulley can be used to give a V.R of 2   (1mark)

d)   In an experiment using a pulley system the following result were obtained.

% efficiency	33.3	44.4	61.5	70.6	76.5	80
MA	1.67	2.22	3.08	3.53	3.89	4.00

i)   Plot a graph of M.A against efficiency.   (5marks)

ii) Use your graph to determine the V.R of the pulley system (2marks)

iii) Give two reasons why the efficiency of a pulley system is always less than 100%. (2marks)