Signature_____ Date_____

232/1
PHYSICS
PAPER 1
(Theory)
JULY/AUGUST 2009
2 HOURS

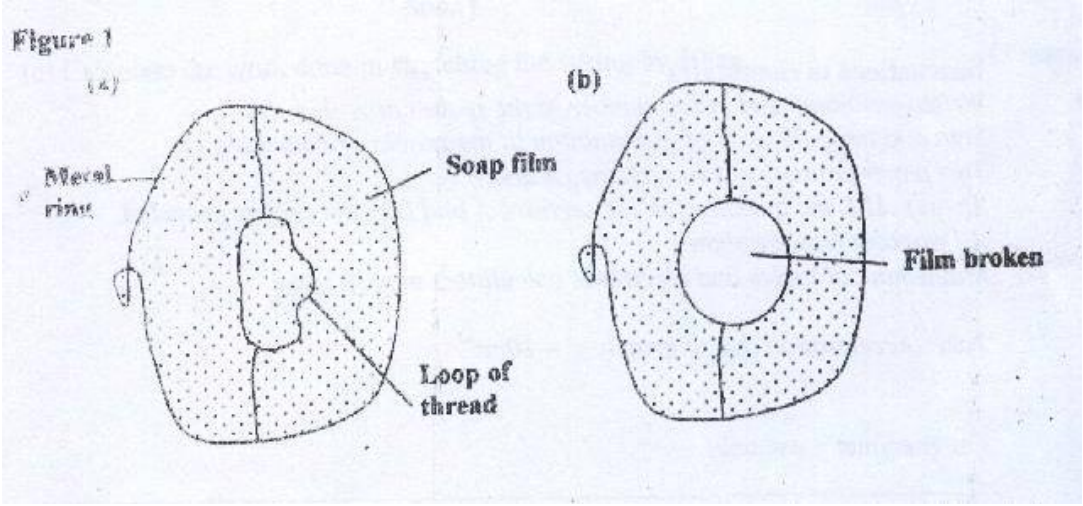
THE BARINGO - KOIBATEK DISTICT

EDUCATIONAL IMPROVEMENT EXAMINATIONS

Kenya Certificate of secondary Education
232/1
Physics
Paper 1
(Theory)
July/August – 2009
2 ½ hours

1. A micrometer screw gauge with a zero error of + 0.05 mm is used to measure the diameter of a wire whose diameter is 18.52 mm. Draw the scale of the micrometer screw gauge if the pitch of the micrometer is 0.5mm (2 marks)

2. Figure 1(a) above below shows a soap film formed on a metal ring and a loop of thread inside the ring. When the film in the loop of thread is punctured it appears as shows in figure 1
(b)



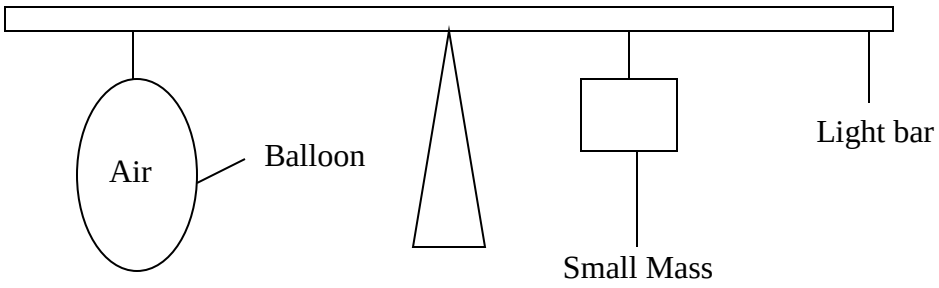
Explain the observation (2 marks)

3. Start the kinetic theory of matter (1 mark)

4. xplain why an iron gate feels older when touched but its wooded gatepost feels warm at night (1 mark)

5. The system in Figure 2 is in equilibrium at room temperature. The system is taken outside where the temperature is 10^0C higher for sometime.

   Figure. 2

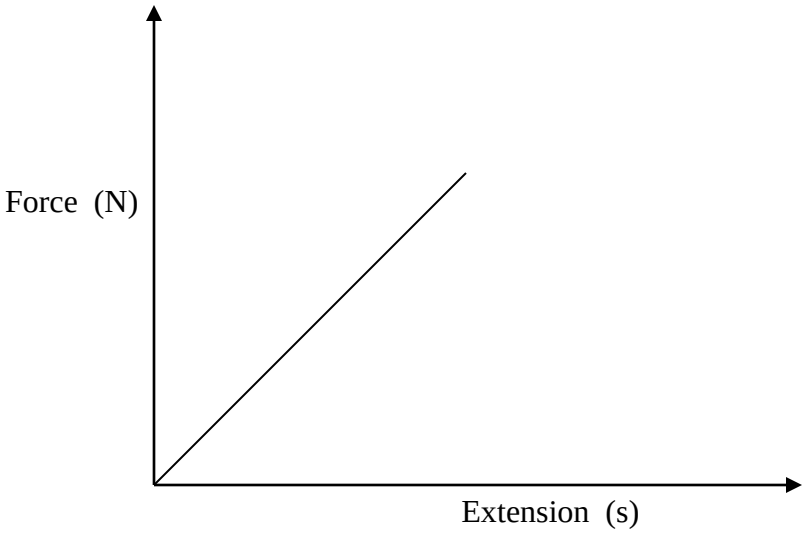


Explain why it tips to the right when it is taken outside the room (2 marks)

6. A mercury barometer reads 75cm Hg at the base of Mt. Kenya. Assuming tghat the height of the mountain is 1088m and the average density of air is 1.25 kgm^{-3}. what is the reading of the barometer at the barometer at the top? (Take the density of mercury as 13.6 gcm^{-3}) (3 marks)

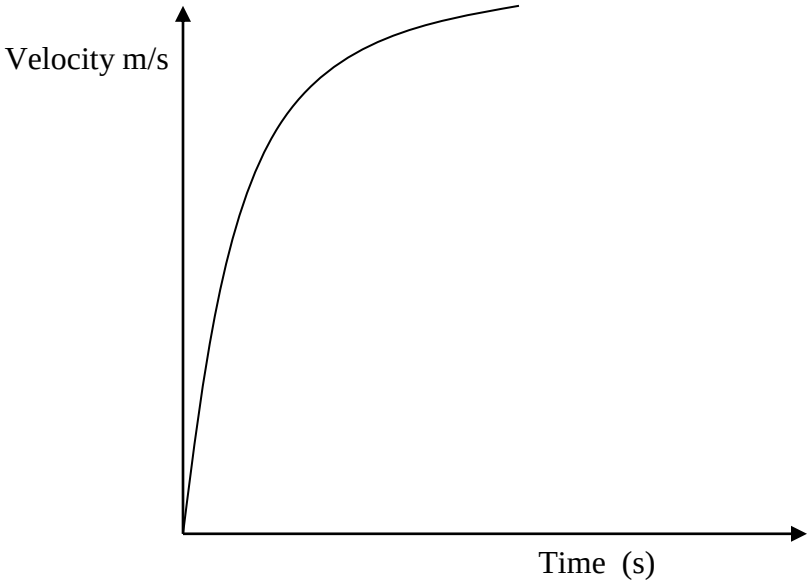
7. State two ways in which the stability of a body can be increased (2 marks)

8. Figure 3 below shows the variation of force with extension for a steel coil spring. In the same diagram sketch the variation of force with extension for the wire from which the spring is made.
   Explain the differences between the sketches (2 marks)



9. Give the differences between streamline and turbulent flow of fluids (2 marks

10. The graph in figure below shows the motion of a ball bearing falling though glycerine in a long glass jar.



(a) On the same axes draw the graph of the motion of the same ball falling through water (1 mark)

(b) Show all the forces acting on the ball bearing while falling through the liquid (3 marks)

11. How is velocity different from speed? (1 mark)

12. A certain fixed mass of gas at 27^0C occupies a volume of 20 litres. What would be the temperature the gas at a volume of 15 litres at constant pressure? (2 marks)

13. Explain why the efficiency of a machine is less than 100% (1 mark)

Section B (55Marks)

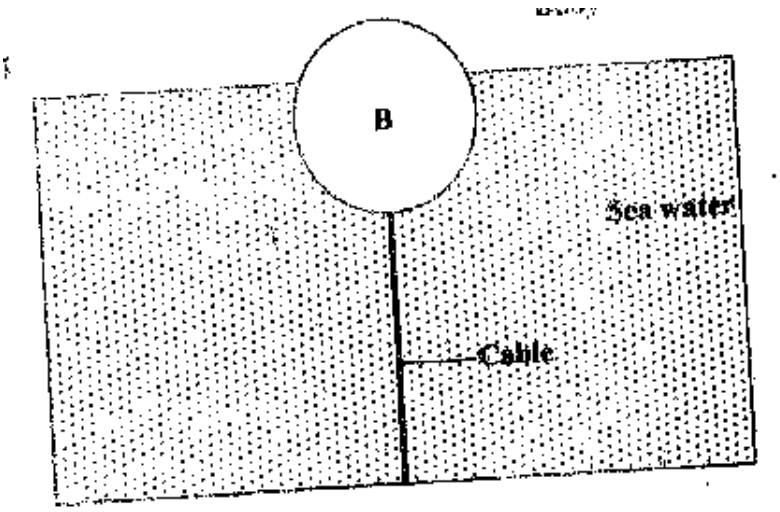
Answer all Questions in the spaces Provided

14 (a) You are provided with the following apparatus

- A solid mass m
- Water of density P_w
- Liquid of density P_l
- Spring balance
-

Describe how you would determine the relative of the liquid (6 marks)

(c) Figure 5 below shows a bouy B of volume 40 litrers and mass 10kg. it is held in a position in seawater of density 1.04 gcm^{-3} by a light cable fixed to the bottom so that ¾ of the volume is below the surface

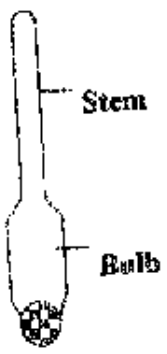


(i) Show all the forces acting on the buoy at equilibrium (3 marks)

(ii) Determine the tension in the cable (3 marks)

(d) Figure 6 below shows a bulb hydrometer

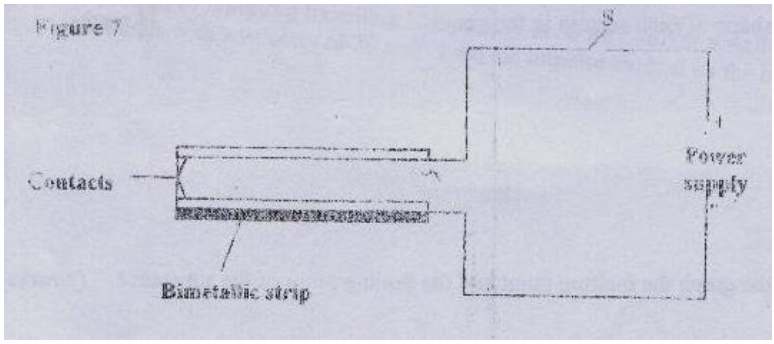
Figure 6



(i) State the principle used in the hydrometer

(ii) Explain why the hydrometer has a weighted bulb and narrow stem?

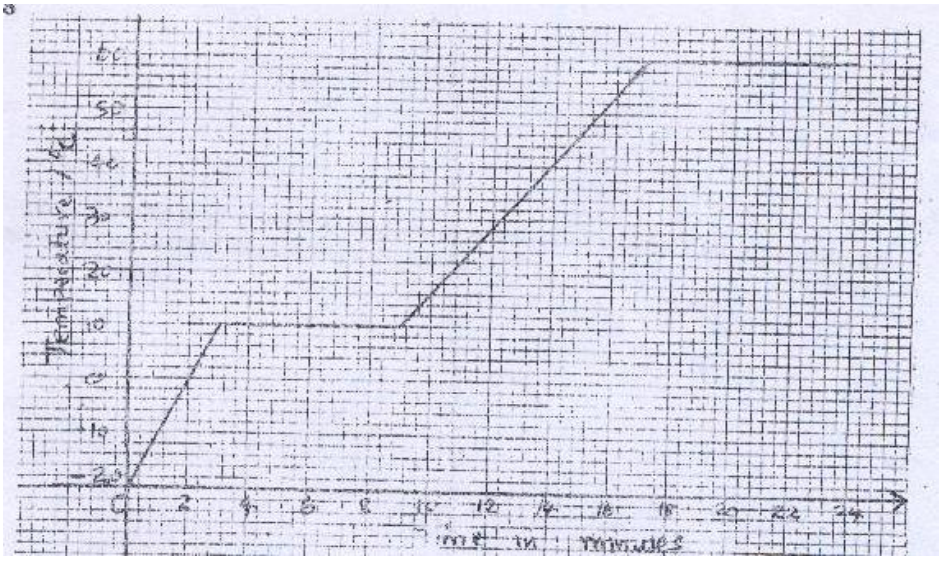
14. (a) Figure 7 below shows a circuit diagram for controlling the temperature of a room



(i) Explain the purpose of the strip

(ii) Describe how the circuit controls the temperature when the switch S is closed (2 marks)

(b) The graph in figure 8 Shows the effect of heat on a solid compound



(i) Explain the shape of each section in the graph (4 marks)

OA –

AB –

BC-

CD-

(ii) Read from the melting point and the boiling point of the substance (2 marks)

M.P

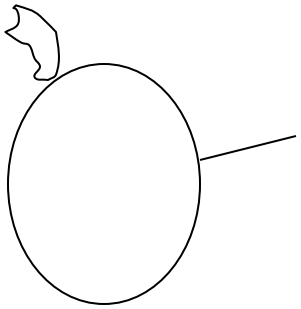
B.P

(iii) If the average rate of heat supply during the stage AB is 240J/Min and the mass of the solid is 80g, calculate the specific latent heat of fusion of the solid (4 marks)

16 (a) State Newton's Second law of motion (1 mark)

(b) A ball of mass 20 g traveling horizontally at 30 ms^{-1} strikes a wall at right angle and rebounds with a velocity of 20$ms^{-1.}$ Find the impulse exerted on the ball. (3 marks)

(c) Figure 9 shows an inflated balloon. State the direction it will take when pierced at the point shown with the arrow. Give a reason. (2 marks)

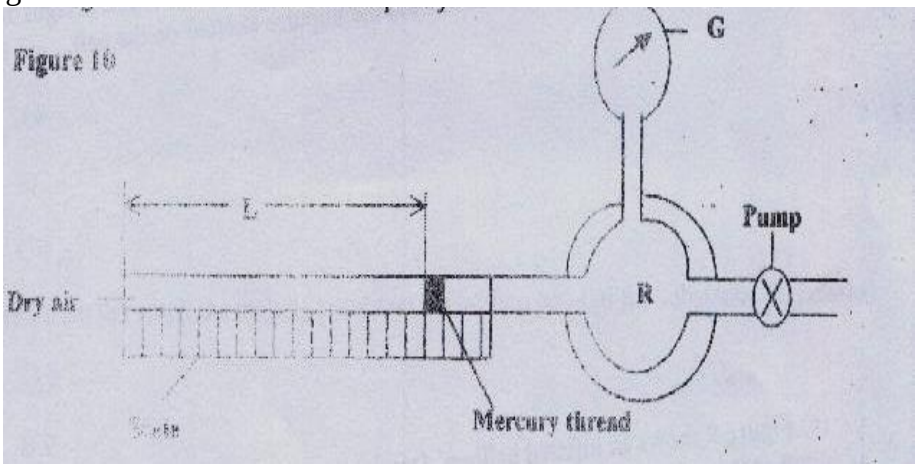


Inflated balloon

(d) A vehicle moving over a vertical section of a bridge of radius 30m. calculate the critical speed for the car not to skid over the bridge (3 marks)

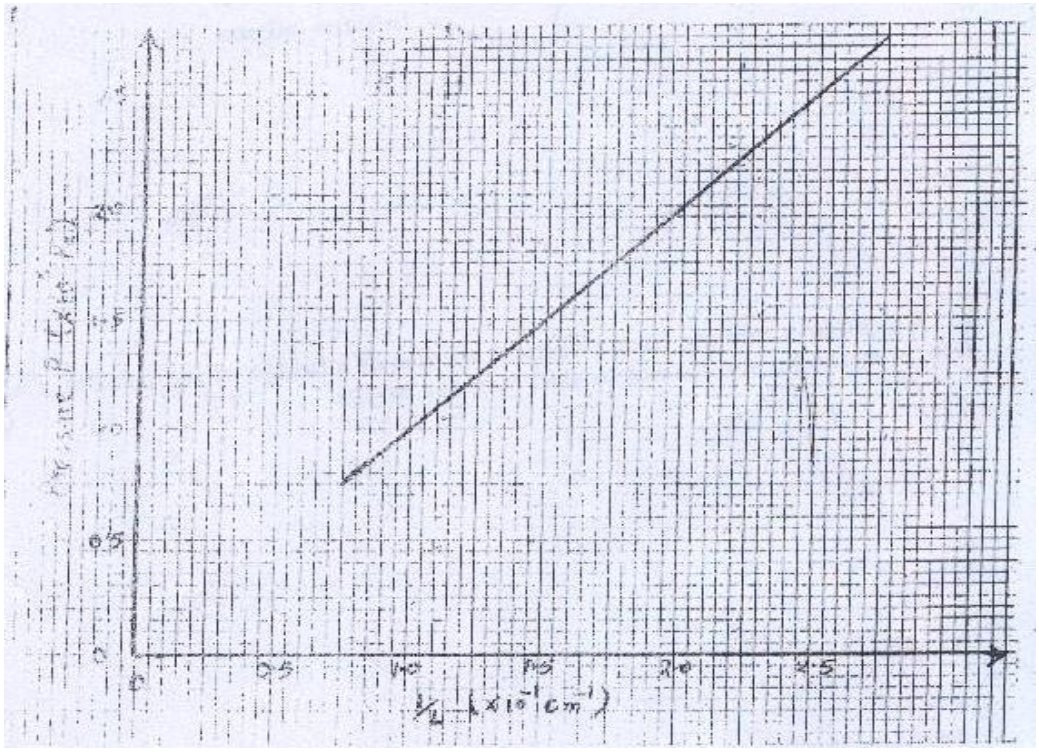
17 (a) state Boyle Law (1 mark)

(b) Figure 10 below shows a certain mass of a gas trapped in a capillary tube of uniform cross – section area by the mercury thread. The pressure on the enclosed air is varied by pumping air into the reservoir R using a pump. G is a pressure gauge. The scale measures the length of the air column in capillary
Figure 10.



The Figure below shows the graph of pressure (pa) against 1 (cm^{-1}) for the results obtained to the above experiment

Figure 11.



(i) Determine the gradient of graph (3 marks)

(ii) Given that the relation connecting p and L is given by PL = 10 K,
Determine the value of K. (3 marks)

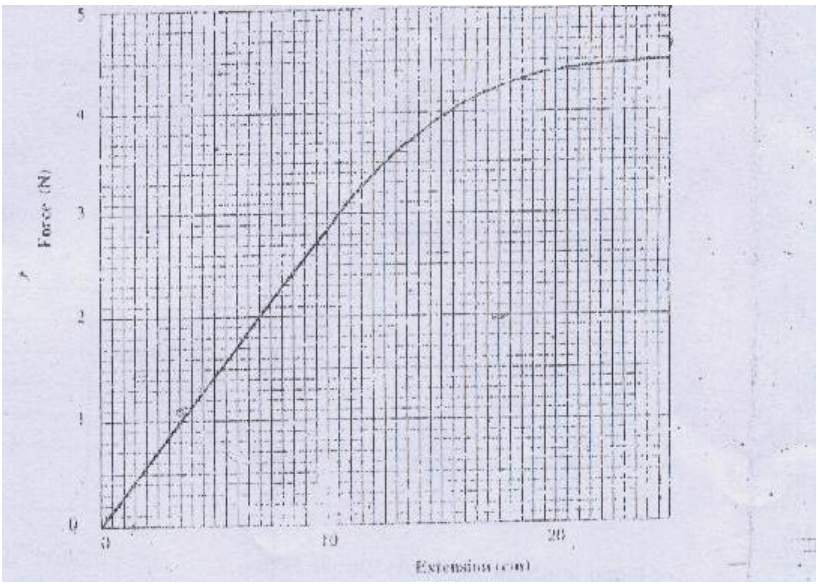
(iii) Deduce from graph the value of the atmospheric pressure if the length of the air column is 10 cm when the air column is open to the atmospheric pressure (1 mark)

(c) State one assumption observed in the above experiment (1 mark)

18 (a) State Hook's Law (1 mark)

(b) One end of a piece of spring was fixed to a rigid support and the other end pulled with a force of varying magnitude. The graph in Figure shows the relationship between forces against extension.

Figure 12.



Using the graph determine

(i) The stretching force at the elastic limit (2 marks)

(ii) The spring constant (3 marks)

(c) Calculate the work done in stretching the spring by 10 cm (3 marks)