Name: …… **Index No. ……**

School: …… **Candidate's Sign. …….....**

Date: ……..

232/1
PHYSICS
PAPER 1
JULY/AUGUST 2011
TIME: 2 HOURS

BUSIA DISTRICT JOINT EVALUATION TEST

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

Physics
Paper 1

INSTRUCTIONS TO THE CANDIDATES:

- Write your **name and index number** in the spaces provided above.
- Answer ***all*** the questions both in section **A** and **B** in the spaces provided below each question
- All workings ***must*** be clearly shown; marks may be awarded for correct steps even if the answers are wrong.
- Mathematical tables and silent electronic calculators may be used.

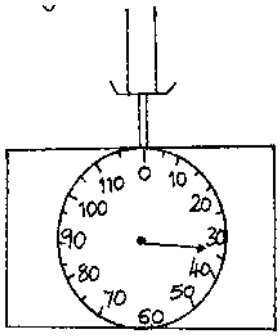
For Examiners' Use Only

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
Section A	1-11	25	
Section B	12	10	
	13	11	
	14	11	
	15	13	
	16	10	
	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.

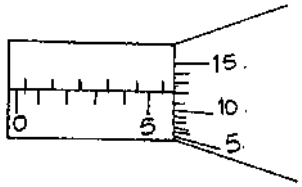
SECTION A 25 MARKS

1. The figure below shows an empty beaker placed on the top of a pan calibrated in grammes.



50ml of alcohol of density 0.8g/cm^3 was added to the beaker. Show on the diagram the new pointer position.

2. The diagram below shows a portion of a micrometer screw gauge used to measure the diameter of a metal pipe. The reading on the gauge when the jaws were fully closed without the pipe was 0.012cm



What is the length of the pipe? (2mks)

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3. Given that the radius of the pipe is 1.20 cm, find its volume. (1mk)

4. a) What is surface tension? (1mk)

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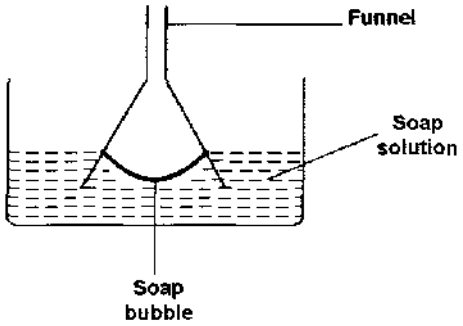
b) Figure 2 shows a funnel dipped into a liquid soap solution.

Fig. 2



Explain what happens to the soap bubble when the funnel is removed. (1mk)

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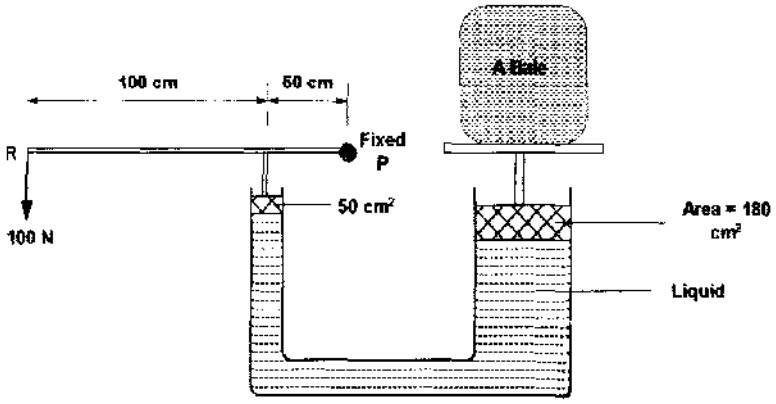
Figure 3 shows a hydraulic press system using a lever of negligible mass on the side of a small piston pivoted at point **P**. A force of l00N is applied at **R**.

Fig. 3

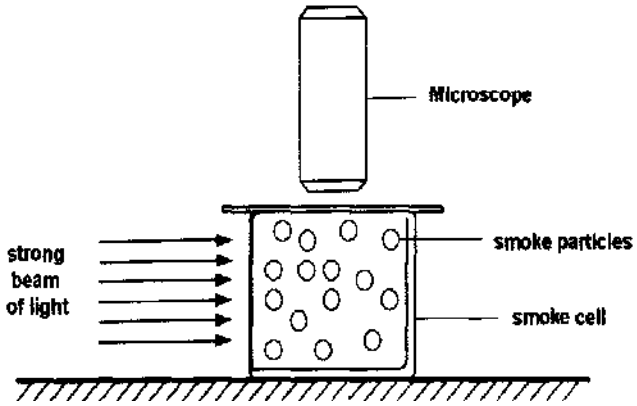


Use this information to answer question 5 and 6.

5. Calculate the force **F** exerted by small piston on the liquid. (2mks)

6. Find the weight of the Bale supported by the large piston (2mks)

7. Figure 4 shows apparatus used to observe the behaviour of smoke particles in a smoke cell. Fig. 4



a) Explain what was observed (1mk)

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b) Explain what happens if the temperature was raised. (1mk)

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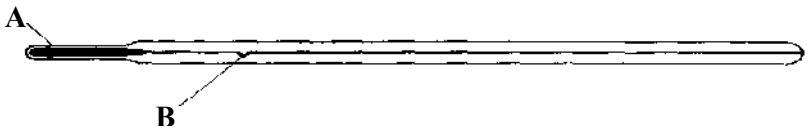
Figure 5 shows a clinical thermometer which is not graduated.

Fig. 5



a) Name the parts indicated with letters: **A** and **B.** (1mk)

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b) Mark the appropriate scale range in degrees Celsius (1 mk)

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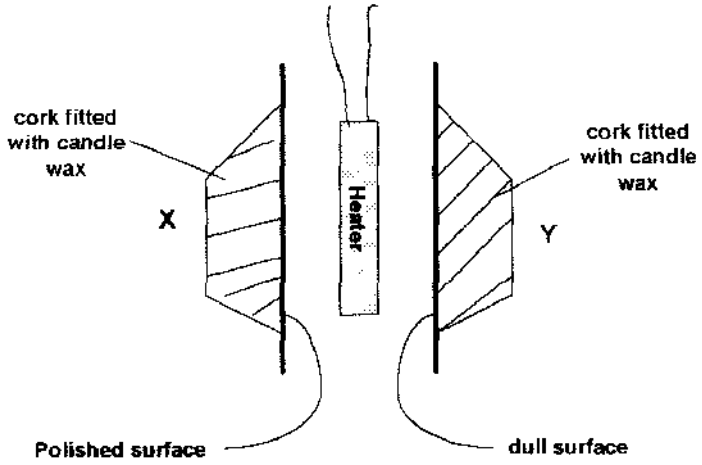
8. Figure 6 shows two corks **X** and **Y** fixed on a polished plate and a dark plate with candle wax



Explain the observation, when the heater is switched on for a short time. (2mks)

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

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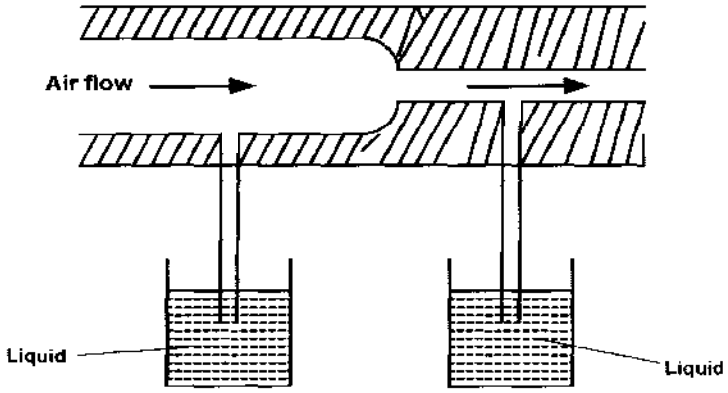
Figure 7 shows air flowing through a pipe of non-uniform cross-sectional area. Two pipes **A** and **B** are dipped into liquids as shown.

Fig. 7



a) Indicate the levels of the liquids in Pipe **A** and pipe **B**. (1mk)
b) Explain your answer in (a) above. (1mk)

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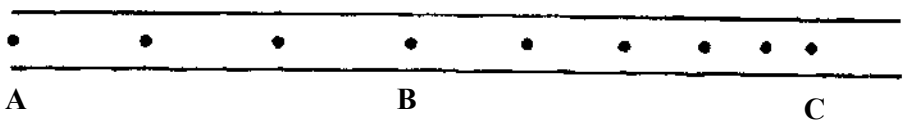
10. Figure 8 shows dots which were made by a ticker timer-tape attached to a trolley.

Fig. 8

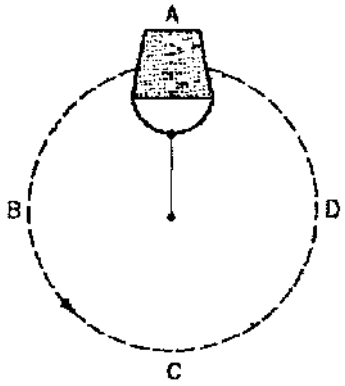


If the frequency used was 50 Hz, determine
a) the velocities between AB and BC (2mks)

b) the deceleration of the trolley. (2mks)

11. Figure 9 shows a pail of water being swung in a vertical circle.

Fig. 9



Explain why the water does not pour out when the pail is at position **A** as shown. (1mk)

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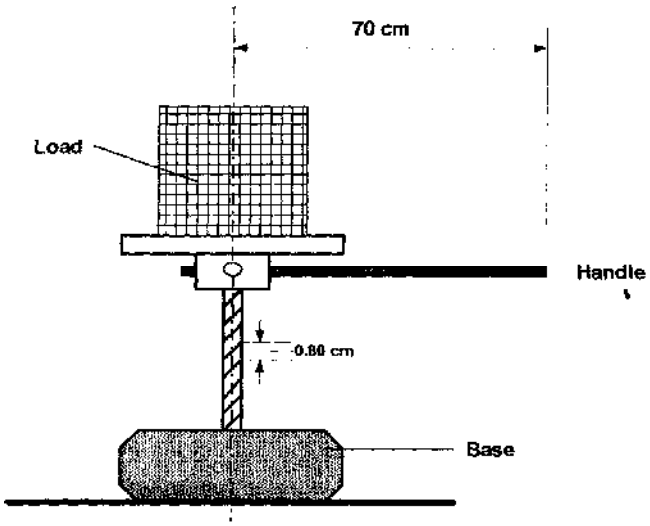
SECTION B - 55 MARKS

Answer <u>all</u> questions in this section in the spaces provided.

12. a) A rifle of mass 4.0 kg fires a bullet of mass 12.0 g with a muzzle velocity of 700 ms^{-1}. Assuming that the rifle is free to move. Find the velocity of recoil. (3mks)

b) Figure 10 shows a cross-section of a handle of a screw jack 70 cm long. The pitch of the screw is 0.8 cm.

Fig. 10



Given that the efficiency is 65%, calculate:

i) the velocity ratio of the system (2mks)

ii) the mechanical advantage of the screw jack. (2mks)

c) Sketch a graph of efficiency against Load (1mk)

d) Draw a single moving pulley with a velocity ratio of 2. (2mks)

13. a)Define latent heat of vaporization. (1mk)

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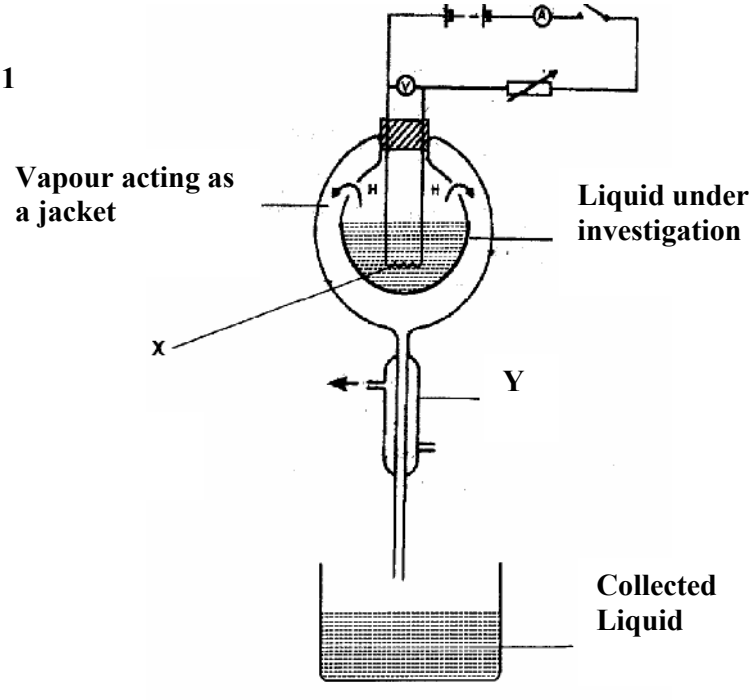
b) Figure **11** shows a set up by a student to determine the specific latent heat of vaporization of a liquid.

Fig. 11



i) Identify the parts labelled **X** and **Y** (2mks)

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ii) State the measurements that should be taken. (2mks)

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iii) Describe how the set up can be used to determine the specific latent heat of vaporisation of the liquid. (5mks)

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iv) What is the purpose of the condenser? (1mk)

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14. a) Define Pressure Law (1mk)

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b) State **one** basic assumption of the kinetic theory of gases. (1mk)

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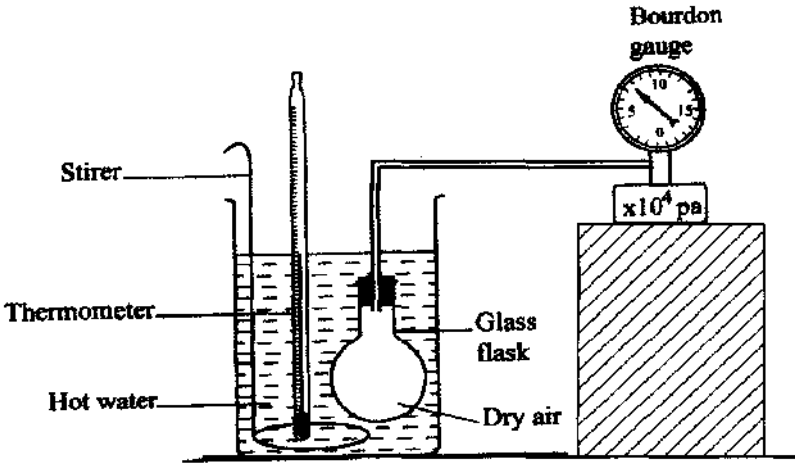
c) Figure 12 shows a set up that may be used to verify Pressure law.

Fig. 12



i) State the measurements that may be taken in the experiment. (2mks)

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ii) Explain how the measurement in (i) above may be used to verify Pressure law (4mks)

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iii) A car tyre is at an air pressure of 4.0×10^5 Pa at a temperature of 27 °C. While it is running the temperature rises to 75 °C. What is the new pressure in the tyre?
(Assume the tyre does not expand) (3mks)

15. a) i) State Archimedes's Principle. (1mk)

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ii) An object weighs 1 .04N in air, 0.64N when fully immersed in water and 0. 72N when fully immersed in a liquid. If the density of water is 1000 kgm^{-3},find the density of the liquid. (4mks)

b) i) State the law of floatation (1mk)

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ii) Give a reason why a steel rod sinks in water while a ship made of steel floats on water. (1mk)

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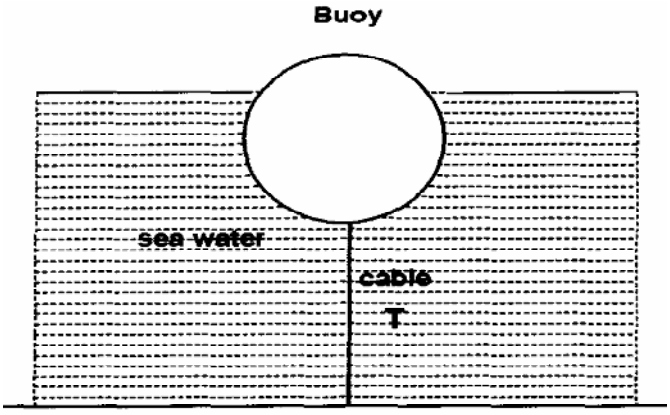
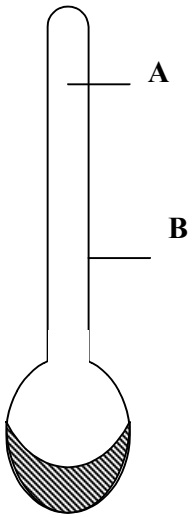
iv) Figure 13 shows a buoy, B, of volume 40 litres and mass 10 kg. It is held in position in sea water of density 1.04gcm^{-3} by a light cable fixed to the bottom so that $\frac{3}{4}$ of the volume of the buoy is below the surface of the sea water. Determine the tension T in the cable. (4mks)

Fig.13



b(iii) The figure below shows a diagram of a hydrometer which is suitable for measuring the densities of liquids varying between 1.0 and 1.2g cm^{-1}



On the diagram indicate the label corresponding to 1.0 and 1.2 g/cm^3 (2mks)

16. a) State Hooke's laws (1mk)

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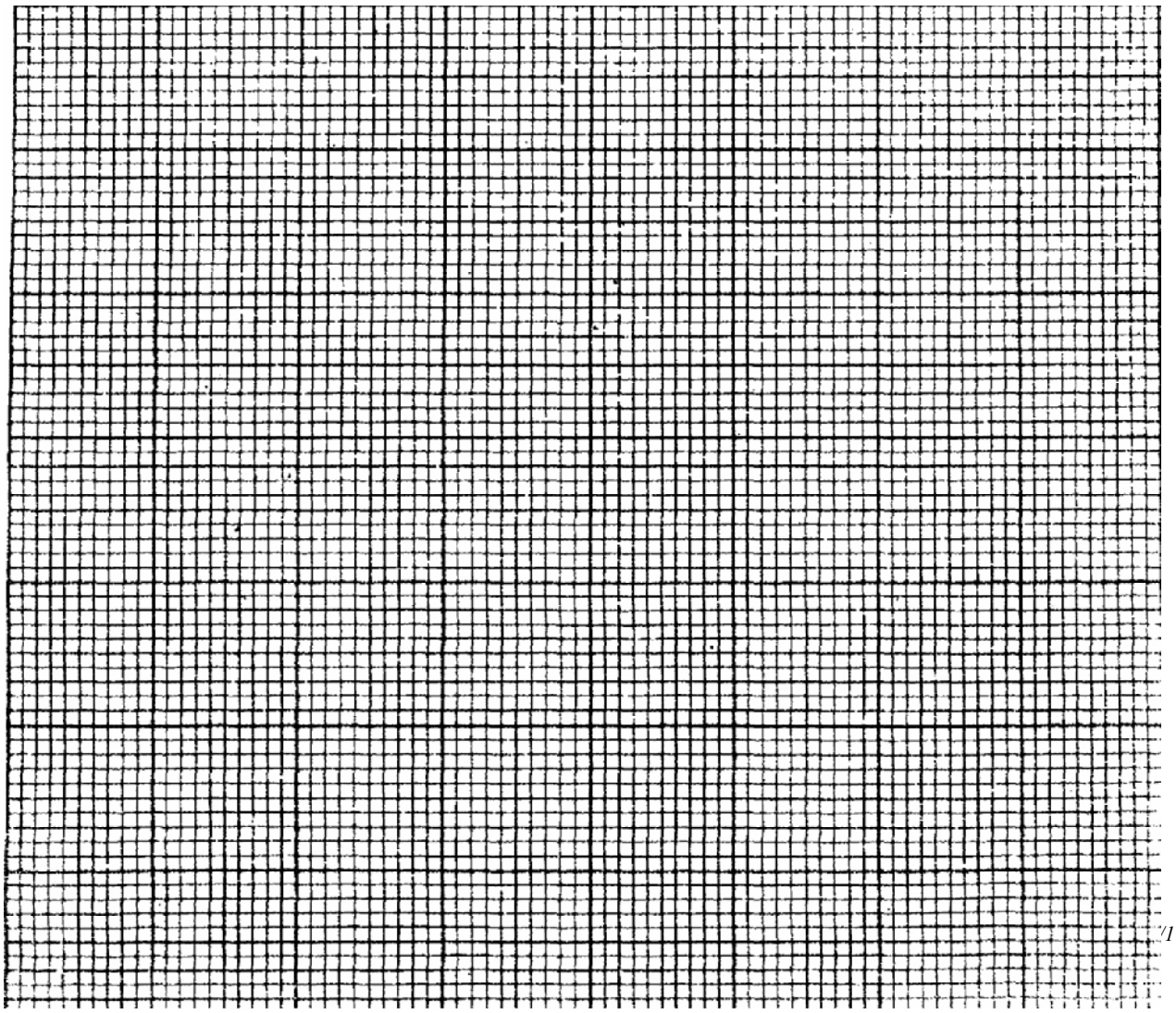
b) The following results were obtained in an experiment to verify Hooke's law when a spring was extended by hanging various loads on it.

Load, L (N)	0.00	1.00	2.00	3.00	4.00	5.00	6.00
Length of spring (cm)	10.00	11.50	13.00	14.50	16.00	18.50	24.00
Extension ,e (cm)	0.00						

i) Complete the table for extension, e, above (1mk)

ii) Plot a graph of Load (y-axis) against extension. (5mks)



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ii) From the graph, determine the spring constant, k (3mks)