NAME: .....CLASS:.....ADM NO:.....

SIGNATURE:.....INDEX NO:.....

232/1
PHYSICS
PAPER 1
MAY / JUNE 2014

KASSU JET EXAMINATION - 2014

Kenya Certificate of Secondary Education

Physics Paper 1

Instructions to candidates

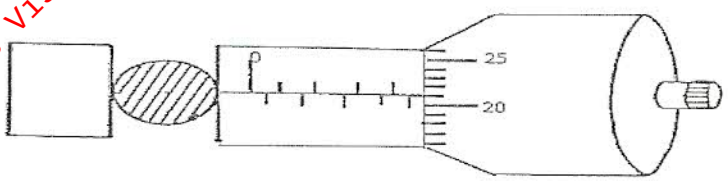
- This paper consists of two sections A and B.
- Answer all the questions in the two sections in the spaces provided after each question
- All working must be clearly shown.
- Electronic calculators, mathematical tables may be used.
- All numerical answers should be expressed in the decimal notations.

SECTION	QUESTION	MAX MARKS	CANDIDATE'S SCORE
I	1 – 14	25	
II	15	10	
	16	13	
	17	7	
	18	13	
	19	11	
TOTAL		80	

This paper consists of 13 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 the reading of micrometer screw gauge with a metal sphere of mass 1.75g placed between its jaws .The readings on the gauge when the jaws were fully closed without the sphere was 0.012cm. What is the volume of the sphere? (2marks)



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2. State two factors that reduce the stability of a vehicle while going round a banked road. (2 marks)

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3. Which is easier to balance on a finger tip; a glass which is upright or a glass which is inverted with a finger inside? Given a reason. (2marks)

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4. A solid displaces $5.5m^3$ of paraffin when floating and $20.0m^3$ when fully immersed in it. Given that the density of paraffin is $0.8g/cm^3$, calculate the density of the solid. (3 marks)

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5. State the factor that determines the height to which water rises in a capillary tube in a given place. (1mark)

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6. Show that the density of a fixed mass of gas is directly proportional to the pressure at constant temperature. (2marks)

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7. Water at 20°C falls over a waterfall of height 40m. Calculate the temperature of water at the bottom of the waterfall if 80% of potential energy at the top is converted into heat energy (3marks)

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8. Distinguish between angular and linear velocity. (1mark)

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9. State theoretically what would happen to an ideal gas when it's temperatures is reduced to the absolute zero. (2marks)

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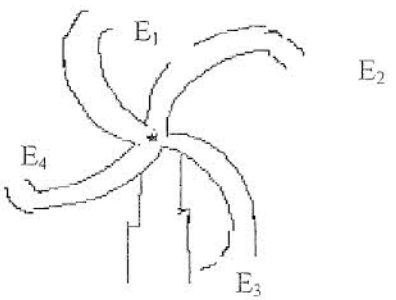
10. The fig below shows a g sprinkler in action. Water is jetting out of ends E_1,E_2,E_3, and E_4.



(a) In which direction will the sprinkler rotate? (1mark)

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(b)What adjustment would you do on the system to make the sprinkler rotate faster?

(1mark)

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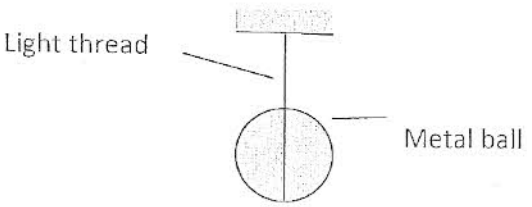
11. The figure below shows a metal ball suspended from a fixed support. When the ball is raised to some height above the rest position and released, the thread breaks. Explain this observation



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12. Concerning the bulb of mercury in glass thermometer. In what circumstances do we need a thermometer with the bulb of very thin walls (1mark)

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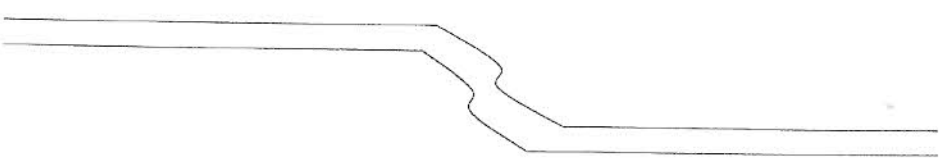
13. The figure below shows a section of an opaque pipe. Assuming that both ends of the pipes are in accessible and you are asked to find out whether water is flowing through the pipe by using the sense of hearing. Indicate the position on the pipe which you would choose.

(1mark)



14. Show that the units of V^2/r are those of acceleration. (1mark)

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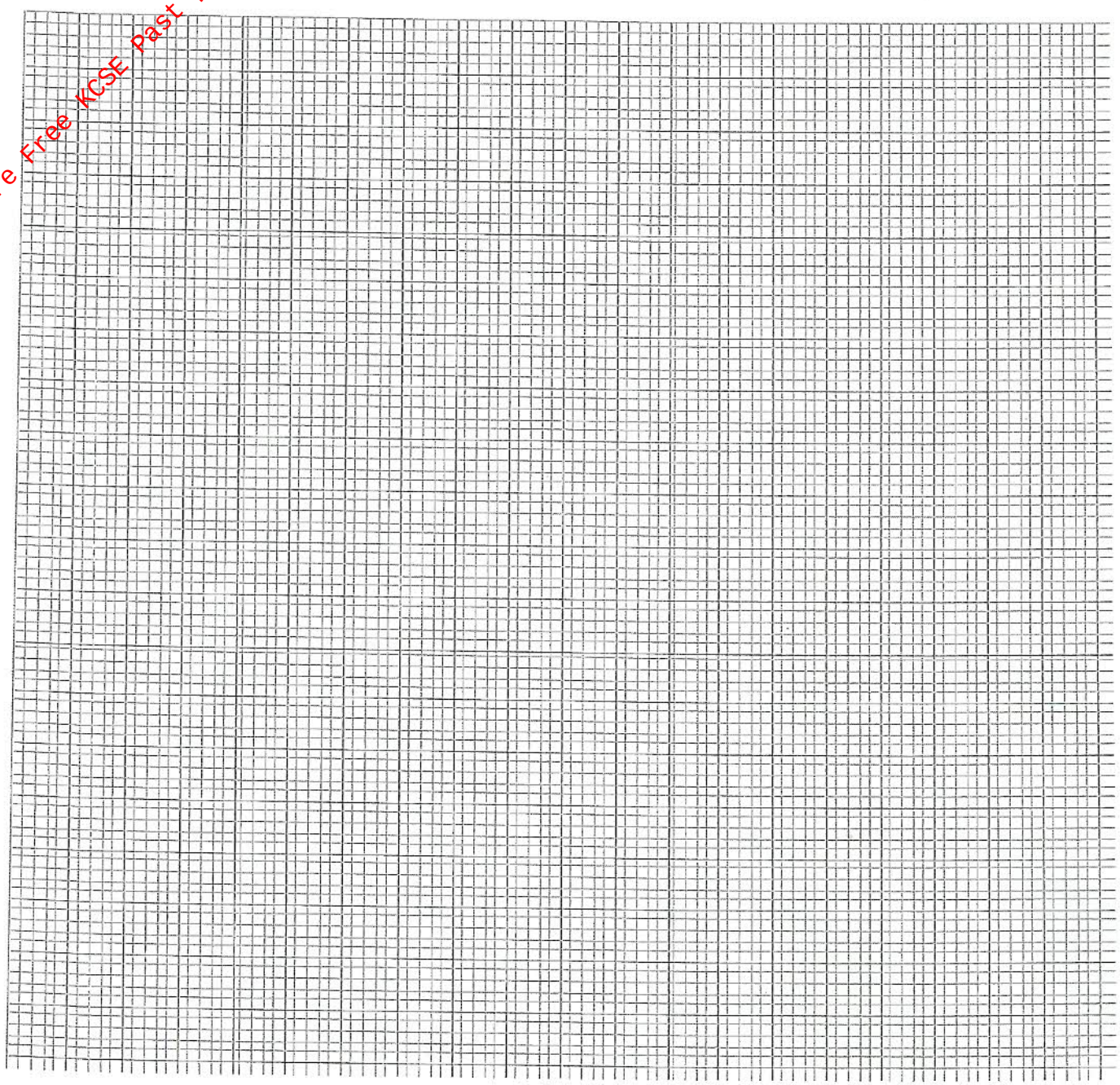
Section B (55 marks)

15. The table below shows the values of the resultant force F and time t for a bullet travelling inside the gun barrel after the trigger is pulled.

Force F(N)	360	340	300	240	170	110
Time t (ms)	3	4	8	12	17	22

(a)On the grid provided plot a graph of force F against time t (4marks)



(b) Determine from the graph;

(i) The time required for the bullet to travel the length of the barrel assuming that the force becomes zero just at the end of the barrel. (1mark)

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(ii) Impulse of the force. (2marks)

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(c) Given that the bullet emerges from the muzzle of the gun with a velocity of 200m/s, calculate the mass of the bullet. (3marks)

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16. (a) Differentiate between floatation and sinking in terms of Archimedes principle. (1mark)

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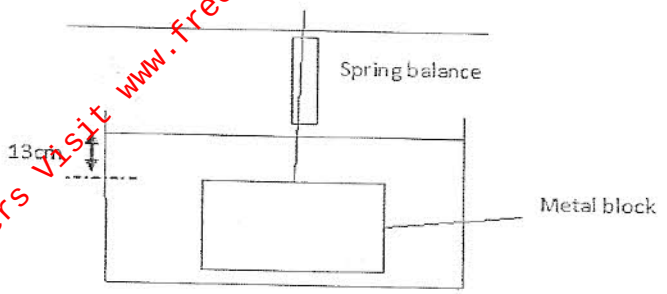
(b) A Solid metal block cross-section area $4cm^2$ and density $2500kg/m^3$ is fully immersed in water, supported by spring balance as shown below.



(i) Name the forces acting on the metal block (3marks)

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(ii) If the upward force acting on the bottom is 5N, calculate the volume of the block.

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(iii) Calculate the apparent weight of the block in water. (3marks)

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(c) The figure shows a cork now floating on water and held to the bottom by a thin thread.

Describe how the forces mentioned in b (i) above changes when water is added into the beaker until it fills up. (3mark)

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17. A student is given the following apparatus in order to find the mass of a piece of rock.
100g mass, Metre rule, Pivot, Cotton thread

(a) (i) Draw a well labeled diagram of the apparatus so that the set up is used to find the mass of the stone. (3marks)

(iii) State the readings the student should take in this experiment. (2marks)

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(iii) Find the mass of the stone given that the 100g mass and the stone are hang at the 5cm and 70cm respectively when the pivot is at 30cm mark. (3 marks)

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18. A copper block of mass 0.5kg is electrically heated with a heater rated 5W. The heater is on for 8 minutes. (Specific heat capacity of copper is 390 $JKg^{-1}K^{-1}$)

(a) Calculate the temperature rise in the block (3marks)

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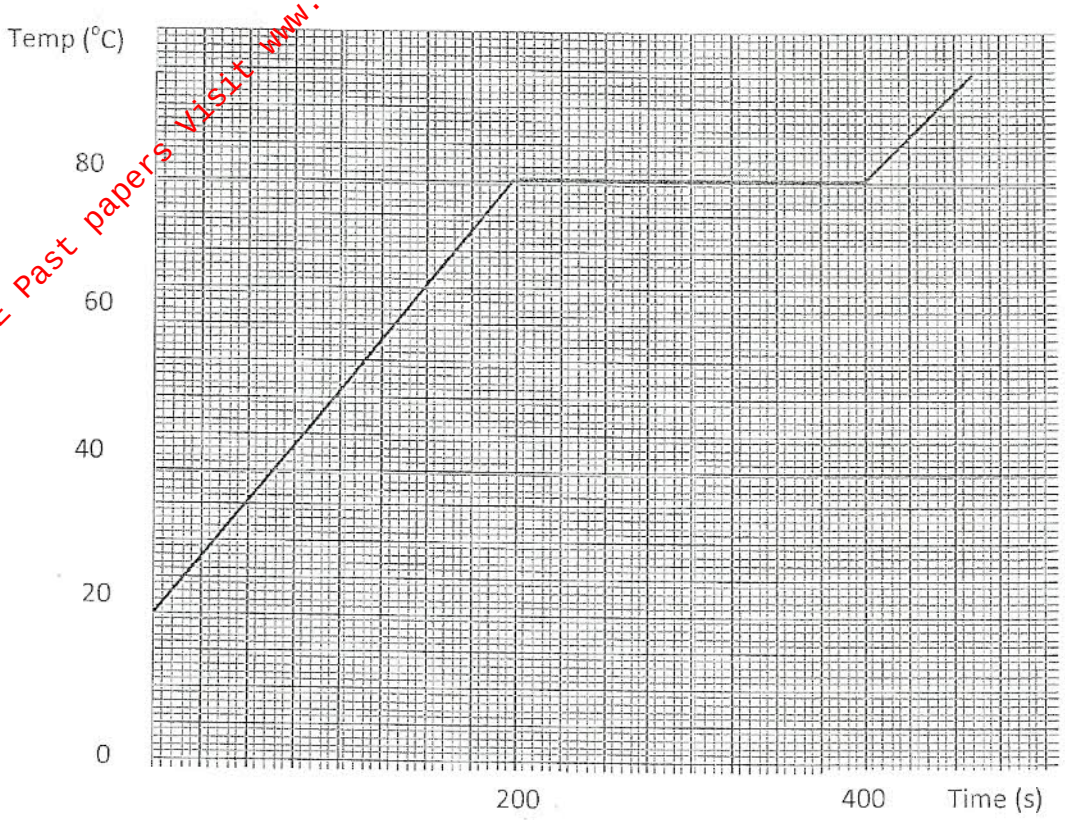
(b) A boiling tube containing 0.10kg of powder is heated electrically by a 5W, heater. The temperatures of the contents is noted at equal intervals and a graph of temperature against time is plotted as shown below.



(i) What is the melting point of the powder? (1mark)

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(ii) Assuming all the heat goes into heating the powder, determine

(a) Specific leaf capacity of the powder (3marks)

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(c) Specific latent heat of the powder (3marks)

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(d) Draw a possible set up that can be used to obtain the results above. (3marks)

19. (a) Explain Boyles' law using Kinetic Theory. (2marks)

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(b) The table below shows the measurement of the volume of a sample of dry hydrogen gas as temperature changed.

Temp. ^{0}c	20	50	100	150	200	250	
Volume (cm^3)	48.1	53.0	61.2	61.2	77.6	85.8	

(i) Name the apparatus you would use to investigate the above Law (2marks)

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(ii) Describe using a labeled diagram how the apparatus shown above are used to investigate the law stating the purpose of each. (4marks)

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(c) (i) A bubble of air rising from the bottom of a pond doubles its volume just as it reaches the surface of the pond. Explain this observation. (2marks)

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(iii) State the assumption made in this observation (1mark)

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THIS IS THE END OF THIS PAPER