NAME_____ **INDEX NO** _____

CANDIDATE'S SIGNATURE_____

DATE_____

232/1
PHYSICS
PAPER 1 (THEORY)
JULY/AUGUST 2014
2 HOURS

MAKINDU DISTRICT INTER – SECONDARY SCHOOLS EXAMINATION

Kenya Certificate of Secondary Education

PHYSICS
PAPER 1 (THEORY)
2 HOURS

INSTRUCTIONS

- Write your name and index number in the space provided
- Sign and write the date of the examination in the space provided above
- This paper consists of two sections A and B.
- Answer all the questions in the spaces provided.
- All workings must be clearly shown.
- Mathematical tables and silent electronic calculators may be used.
- This paper consists of 9 printed pages. Candidates should check to ensure that all pages are printed as indicated and no questions are missing

For examiner's use only

SECTION	QUESTION	TOTAL MARKS	CANDIDATE'S SCORE
A	1-10	25	
B	11	13	
	12	07	
	13	05	
	14	08	
	15	13	
	16	09	
		80	

TOTAL CANDIDATE'S SCORE

Section A [ ] + section B [ ] = [ ]

1. The load carried by a truck loader was measured to be 65,000 grams. Convert the mass of the load into milligrams and express the answer in standard form. (2 Marks)

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2. A form one girl observed that when mercury is put into a glass it does not wet the glass. Explain the observations made by the girl. (2 Marks)

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3. In using the lift pump to raise water from a bore hole. It is observed that practically the height the water is raised cannot be 10m and more. Give two reasons for this observation. (2 Marks)

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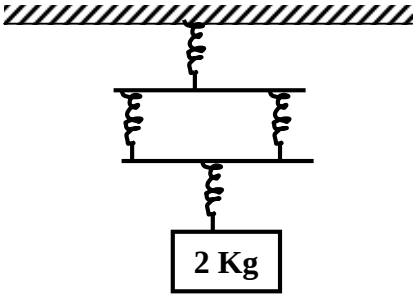
4. When a mass of 2kg is hang from a single spring, the spring extends by a distance x. Determine the total extension in the set up below. (2 marks)



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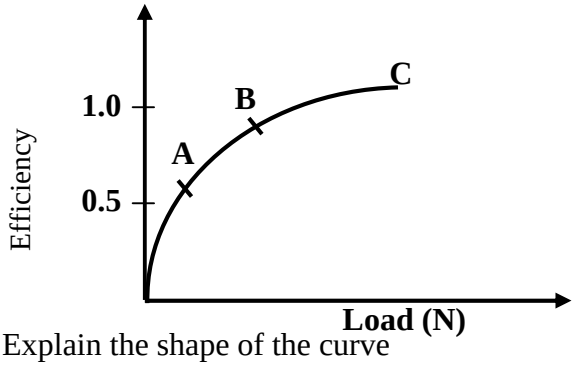
5. The sketch below shows the relationship between the efficiency and the load for a pulley system.



   Explain the shape of the curve (2 Marks)

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(b) State a reason why the efficiency of a machine is always less than 100% (1 Mark)

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6. (i) Explain why bodies in circular motion undergo acceleration even when their speed is constant. (1 Mark)

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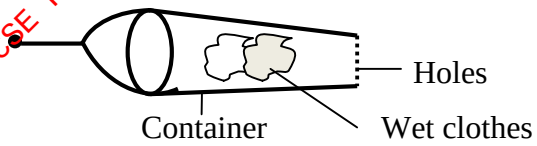
(ii) The figure below shows a container with small holes at the bottom in which wet clothes have been put.



When the container is whirled in air at high speeds, it is observed that the clothes dry faster. Explain how the rotation of the container causes the clothes to dry faster. (2 Marks)

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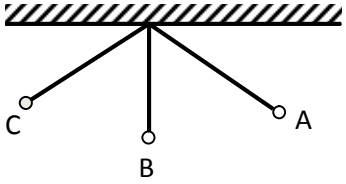
7. The diagram below shows a swinging pendulum.



(i) Which position does the bob have the:

(a) Maximum momentum (1 Mark)

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(b) Minimum kinetic energy (1 Mark)

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(ii) What basic physical quantity can be measured using a single pendulum. (1 Mark)

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8. (a) State the principle of moments (1 Mark)

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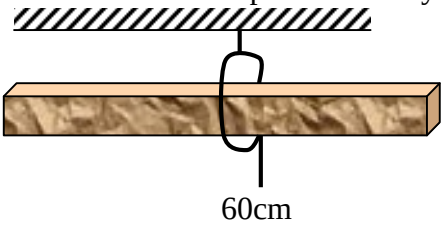
(b) A uniform 1m wooden bar with uniform cross-sectional area of 2.5cm by 2.5cm is suspended at the 60cm mark and kept balanced by hanging a mass 450g at 100cm mark.



Determine

(i) The density of the material of the metre rule (2 Marks)

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(ii) The tension T in the string (1 Mark)

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9. Explain the term sea breeze (3 Marks)

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10. State two factors which affect the rate of diffusion in gases (2 Marks)

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SECTION B – 55 Marks

Answer all the questions in this section in the spaces provided

11. (a) State two characteristics of perfectly inelastic collisions (2 Marks)

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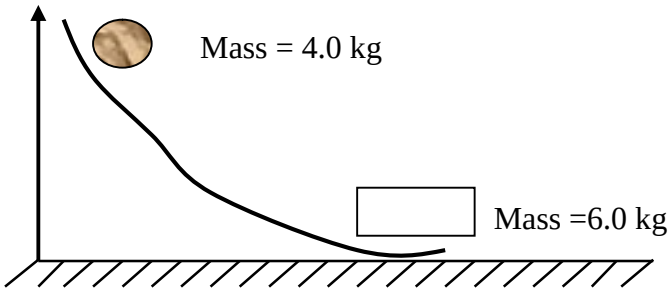
(b) A body of mass 4.0 kg held at a vertical height of 500cm is released to travel along a frictionless curved path as shown in the figure below.



The 4.0kg mass strikes body of mass 6.0kg at rest immediately it reaches the horizontal. The bodies stick together and move in the same direction. Determine the velocity of the bodies immediately after collision. (4 Marks)

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(c) (i) A matatu whose mass is 2500kg is lifted with a jack screw of 10mm pitch. If the handle is 30cm from the screw, find force applied (Neglect frictional force) Take $\pi = 3.14$ (4 Marks)

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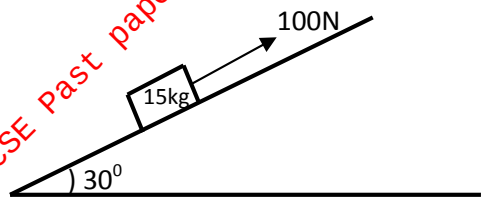
(ii) The figure below shows an inclined plane and a load of mass 15kg pulled by an effort of 100N.



Find the efficiency of the machine (3 Marks)

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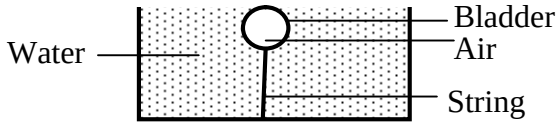
12. (a) The diagram below shows a rubber bladder filled with air and fixed to the bottom of a water container with a string.



Explain why the tension in the string increases when the water is heated (3 Marks)

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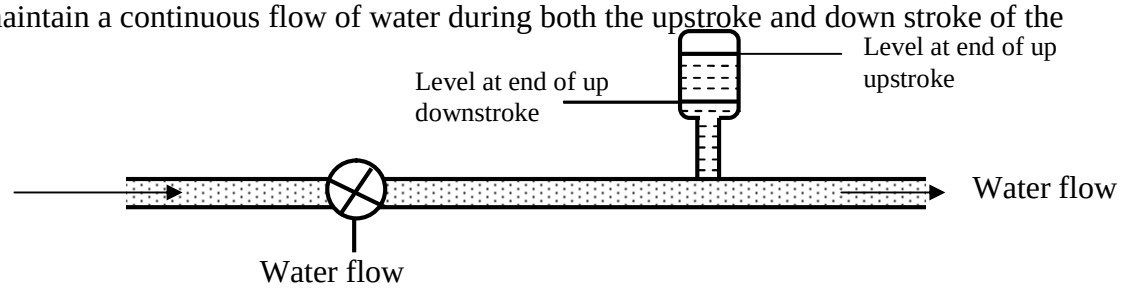
(b) The figure below shows water pump which forces water through a hydraulic system. An air chamber is used to maintain a continuous flow of water during both the upstroke and down stroke of the piston.



Explain how the continuous flow of water is maintained (2 Marks)

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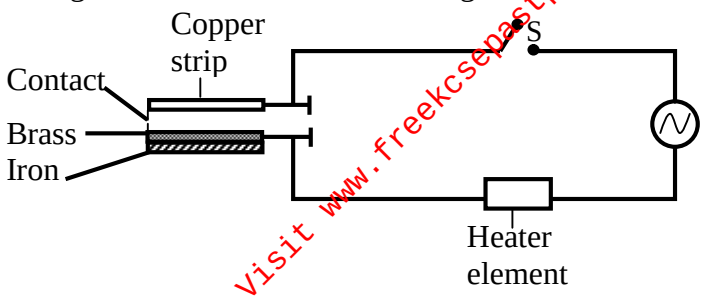
13. (a) The figure below shows a circuit diagram for a device for controlling the temperature in a room.



(i) Explain the purpose of the bimetallic strip. (2 Marks)

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(ii) Describe how the circuit controls the temperature when the switch S is closed. (3 Marks)

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(b) (i) Define the term specific latent heat of vaporization of a substance (1 Mark)

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(ii) An electric kettle rated 2.5kW is used to raise the temperature of 3.0kg of water through 50^0C. Calculate the time required to effect this (Specific heat capacity of water is 4200j/kgK) (3 Marks)

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(c) A 12.9 gram sample of unknown metal at 26.5^0C is placed in a Styrofoam cup containing 50.0 grams of water at 88.6^0C. The water cools down and the metal warms up until thermal equilibrium is achieved at 87.1^0C. Assuming all the heat lost by the water is gained by the metal. Determine the specific heat capacity of the unknown metal. (Specific heat capacity of water is 4.18j/g/^{0}C) (4 Marks)

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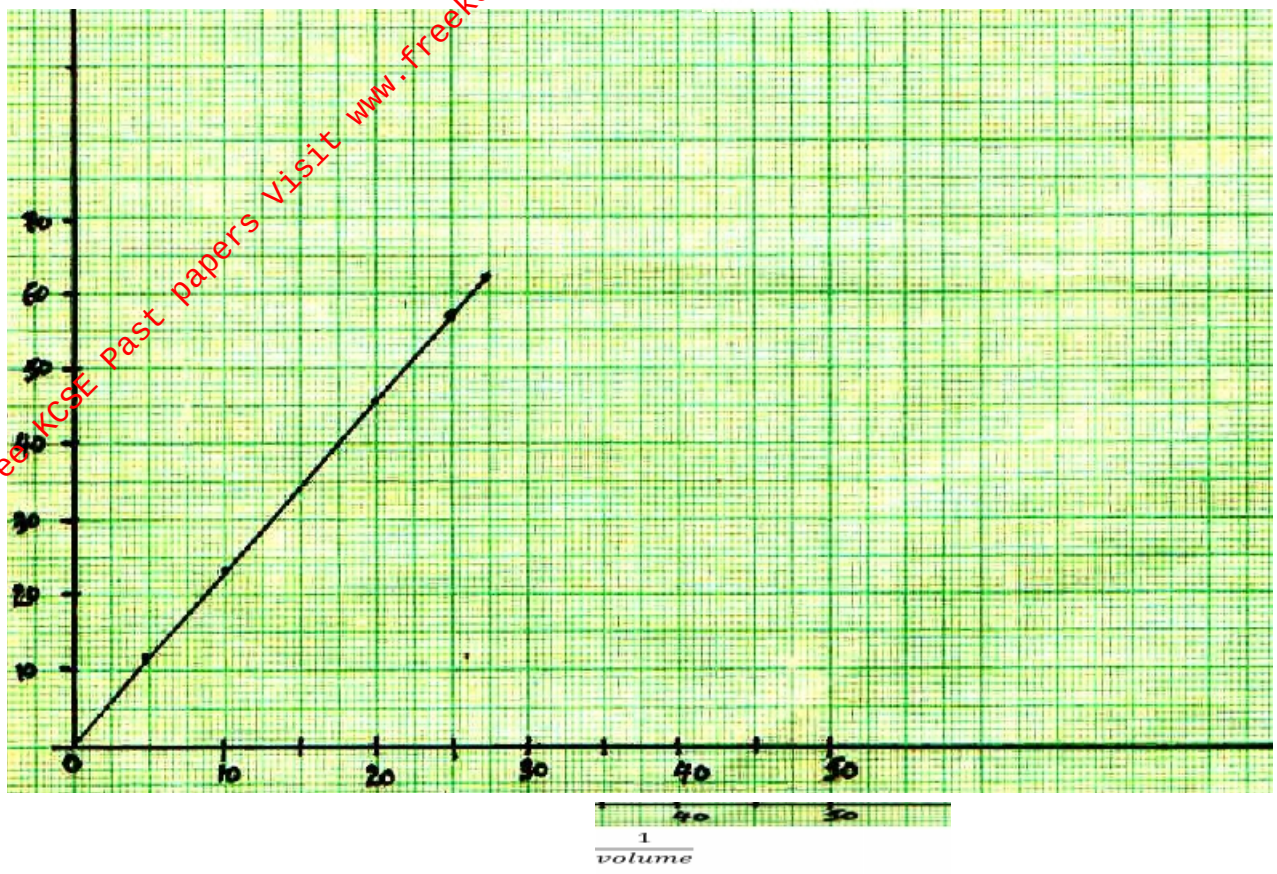
14. (a) The graph below represents the relationship between $\frac{1}{Volume}$ and pressure at constant temperature.



(i) With the aid of a labelled diagram describe the apparatus and arrangements used in getting the results used to plot the graph above. (4 Marks)

(ii) From the graph state the law under investigation. (4 Marks)

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(iii) State and explain how the graph can be used to verify the law stated in (ii) (3 Marks)

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15. (a) State what is meant by streamline flow (1 Mark)

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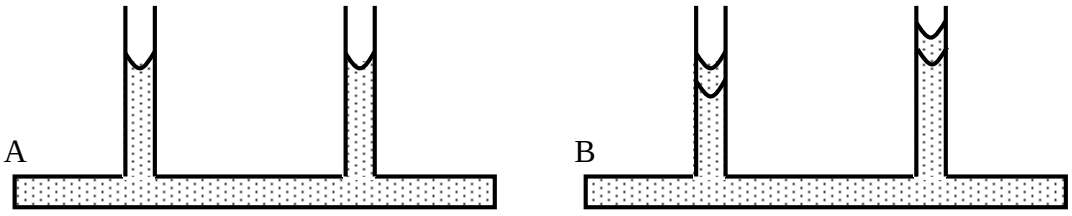
(b) The figure shows the cross section of an aeroplane wing, with the aeroplane moving in the direction shown by the arrow.

Sketch streamlines to show how air flows past the wing as the aeroplane moves (1 Mark)

(c) The diagram below shows two horizontal pipes, A and B. Tube A contains liquid at rest while tube B contains liquid in motion.



(a) Liquid at rest (b) Liquid at motion

(i) Sketch graphs for (a) and (b) to show variation in pressure (2 Marks)

(d) A jet of water emerges from a hose pipe of cross-sectional area $5.0 \times 10^{-3}m^2$ with a velocity of $3.0ms^{-1}$. The water strikes a wall at a right angle and comes to rest without rebounding. Determine the mass of water striking the wall per second (Density of water is 1000 kgm^{-3})

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16. (a) Explain how a hydrometer may be used to test whether a car battery is fully charged (2 Marks)

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(b) A submarine made of iron was observed to float in water while a piece of iron rod sinks in water. Explain this observation (2 Marks)

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(c) A solid displaces 5.0cm3 of paraffin when floating and 20cm3 when fully immersed in it. Given that the density of paraffin is 0.8g/cm3. Calculate the density of the solid (4 Marks)

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(d) Define the term relative density as used in liquids (1 Mark)

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