NAME:……INDEX NO. ……ADM NO….....

Signature: ……

Date: ……

Kenya Certificate of Secondary Education
PHYSICS
232/1
MARCH / APRIL 2018

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

- ***Answer all the questions in the spaces provided.***
- ***The paper consists of sections A and B.***
- ***All workings must be clearly shown.***
- ***Mathematical tables and electronic calculators may be used.***

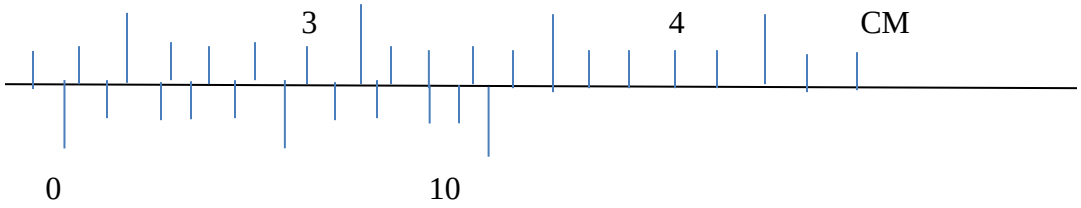
FOR EXAMINER'S USE ONLY:

SECTION	QUESTION	MAXIMUM SCORE	STUDENT'S SCORE
A	1 – 11	25	
B	12	4	
	13	13	
	14	11	
	15	14	
	16	13	
TOTAL SCORE		80	

SECTION A 25 MARKS

Answer all questions in this section

1. The figure below shows a vernier caliper scale.



If the vernier calipers used had a zero error of -0.05cm. What is the actual reading of the scale.? (2mks)

2. A body is projected vertically upwards from the top of a cliff. Assuming that it lands at the base of the cliff. Sketch the velocity time graph of the motion.

. (2mks)

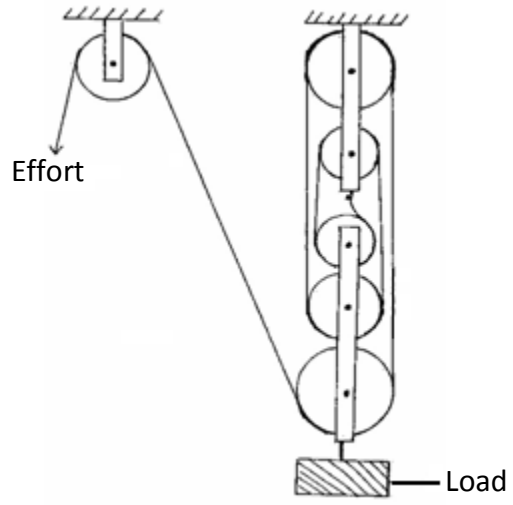
3. The stability of a body can be increased by increasing the base area and lowering its centre of gravity. State **one** way of lowering its centre of gravity.

. (1mk)

4. When a mercury thermometer is used to measure the temperature of hot water, it is observed that the mercury level first drops before beginning to rise. Explain.

. (2mks)

5. The figure **below** shows a machine being used to raise a load. Use the information given in the figure to answer questions **below**.



(a) Determine the velocity ratio (V.R) of the machine.

. (1 mark)

(b) If a load of 800N is raised by applying an effort of 272N, determine the efficiency of the machine.

. (3 markS)

(d)Name the transducer that is used to convert the following form of energies.

(i) Electrical to sound.

. (1 mark)

(ii) Electrical to kinetic.

. (1 mark)

6. Using the idea of particles, explain why the pressure inside the tyre is increased when it is pumped up (2mks)

7. A trolley of mass 1.5kg moving with a velocity of $1.2ms^{-1}$ collides inelastically with a second trolley of mass 0.5kg moving in the opposite direction with a velocity of $0.2ms^{-1}$.

(a) What is an inelastic collision? (1mk)

(b) Determine the velocity of the trolleys after collision.

. (2mks)

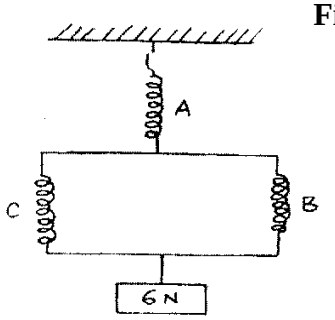
8 Give **one** fact which shows that heat from the sun does not reach the earth surface by convection.

. (1mk)

9. Three identical springs each of spring constant 1.5N/m and weight 0.5 N are used to support a load as shown in figure 4 below.

Determine the total extension of the system (3mks)

Figure 4



10. State **one** reason why mercury is preferred as a barometric liquid and not water

. (1mk)

11. Figure 5 below shows a uniform meter rule balancing when a mass of 200g is hung at one end. Determine the tension **T** in the string

(2mks)

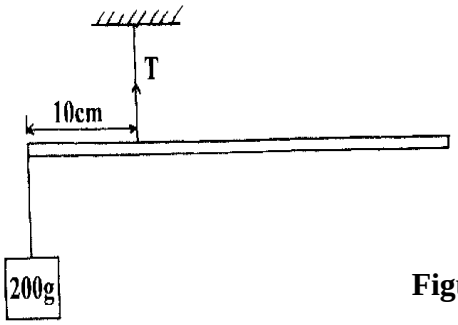


Figure 5

SECTION B (55 MARKS)

12). (a) The figure 6 below shows a stone of mass 450g rotated in a vertical circle at 3 revolutions per second. If the string has a length of 1.5m, determine:

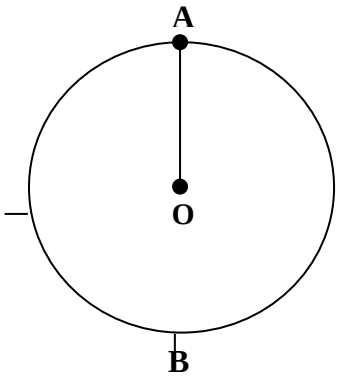


Figure 6

(i) The linear velocity (3mks)

(ii) The tension of the string at position **A** (3mks)

13) (a) State the law of floatation (1mk)

b) Figure 7 shows a piece of cork held with a light thread attached to the bottom of a beaker. The beaker is filled with water.

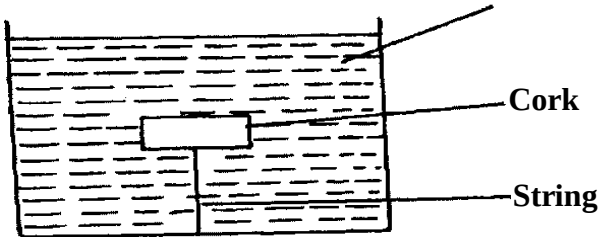


Figure 7

(i) Indicate and label on the diagram the forces acting on the cork (3mks)

(ii)Write an expression showing the relationship between the forces (1mk)

(c) A solid displaces 8.5cm^3 of liquid when floating on a certain liquid and 11.5cm^3 when fully submerged in the liquid.If the density of the solid is 0.8g/cm^3, determine:-

(i) Up thrust on the solid when floating (3mks)

(ii) Density of the liquid (3mks)

14. (a) The Fig. 8 shows a set-up that may be used to verify Charles' law.

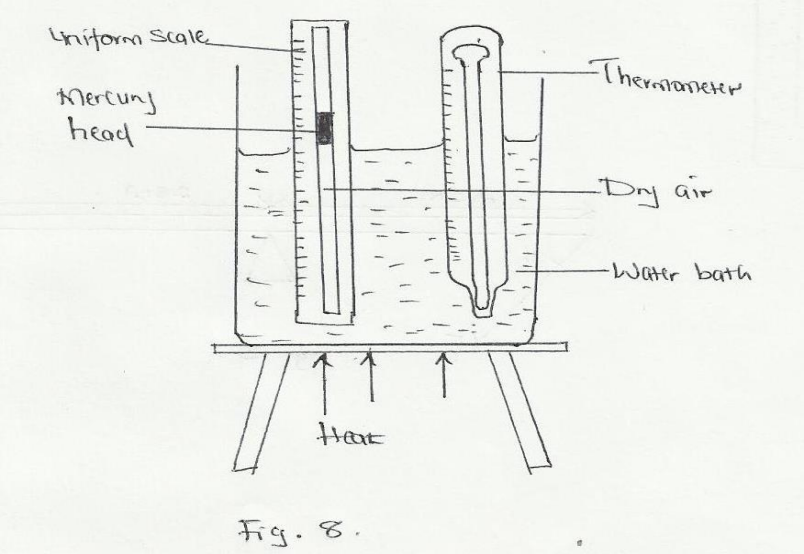


Fig. 8.

(i) State the measurements that should be taken in the experiment. (2 marks)

(ii) Explain how the measurements taken in (i) above may be used to verify Charles' law.
. (3 marks)

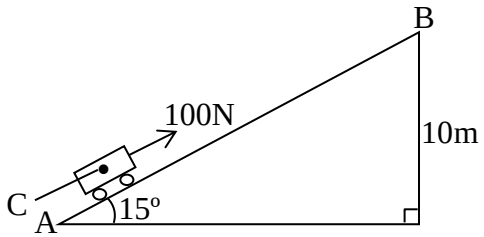
(b) A block of ice of mass 40g at 0^0C is placed in a calorimeter containing 400g of water at 20^0C.Ignoring the heat absorbed by the calorimeter, determine the final temperature of the mixture after all the ice have melted. (Specific latent heat capacity of fusion of ice = 340,000JKg^{-1} and the specific heat capacity of water = 4200 J/KKg

. (4mks)

(c) Give a reason why an air bubble increases in volume as it ascends to the surface of the liquid in a boiler. (1 mark)

(d) Define the term absolute temperature (1 mark)

15) The figure **below** shows an inclined plane, a trolley of mass 30kg is pulled up a slope by a force of 100N, parallel to the slope. The trolley moves so that the centre of mass C travels from points A to B.



(i) What is the work done on the trolley against the gravitational force in moving from **A** to **B**.?

(2mks)

(ii) Determine the work done by the force in moving the trolley from **A** to **B**.
.
(2mks)

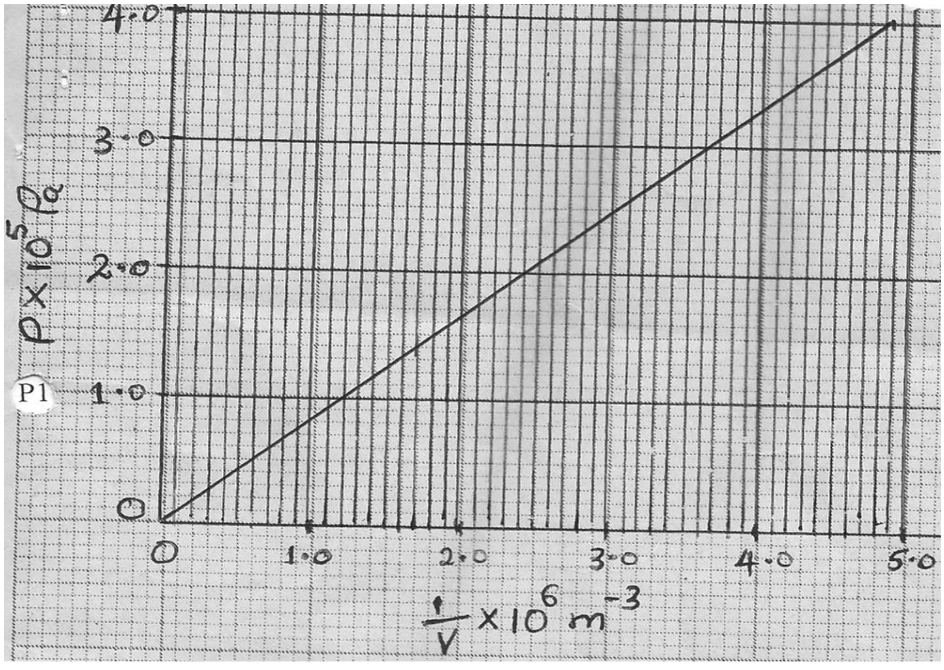
(iii) Determine the efficiency of the system.
.
(3mks)

(iv) Determine the work done in overcoming the frictional force.
.
(1mk)

(v) Determine the mechanical advantage of the system. (3mks)

16(a) State what is meant by an ideal gas (1mrk)
.

(b) The pressure acting in a gas in a container was changed steadily while the temperature of the gas was maintained constant. The value of volume V of the gas measured for various values of pressure. The graph in the figure A shows the relation between the pressure, P1 and the reciprocal of volume 1/V



(i)Suggest how the temperature of the gas could be kept constant (1mk)

(ii) Given that the relation between the pressure P1 and the volume, V1 of the gas is given by PV = k where k is a constant, use the graph to determine the value of k (3mks)

(iii) What physical quantity does **K** represent? (1mk)

(iv) State **one** precaution you would take when performing such an experiment (1mk)

(c) A gas occupies a volume of 4000 litres temperature of 37^0C and normal atmosphere pressure. Determine the new volume of the gas if it is heated at constant pressure to a temperature of 67^0C (normal atmosphere pressure P = 1.01 x 10^5pa)
(3mks)

(d) A footballer kicks a ball of mass 0.6 kg initially at rest using a force of 720N. If the foot was in contact with the ball for 0.1 seconds, what was the take of speed of the ball?
(3mks)

(e) 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 1000kgm^{-3}, find the density of the liquid. (3 mrks)

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