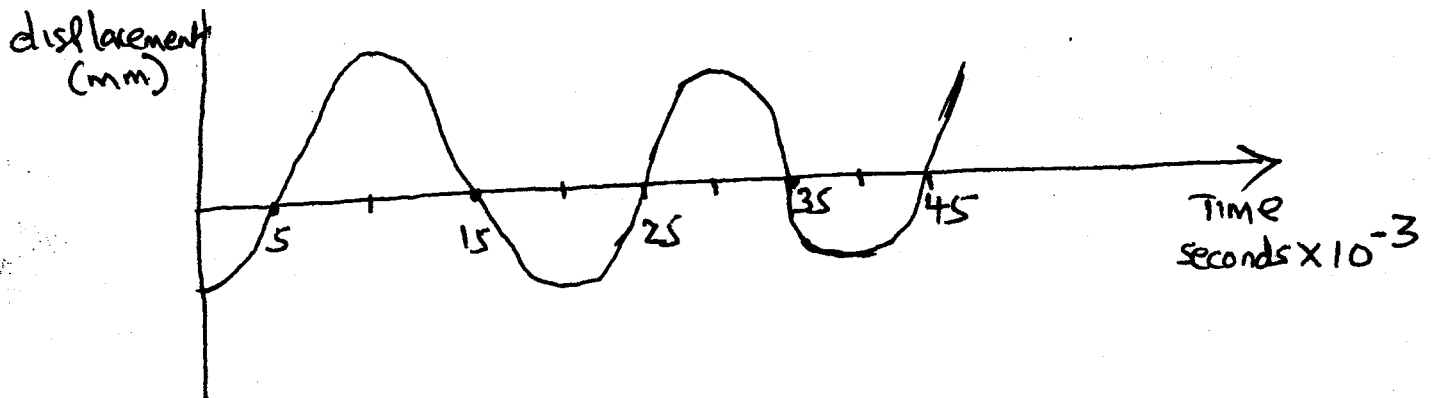


GATITU SECONDARY SCHOOL, P.O. BOX 327 – 01030, GATUNDU

FORM 4 PHYSICS PAPER 2. END OF TERM 1 EXAMINATION. 2015

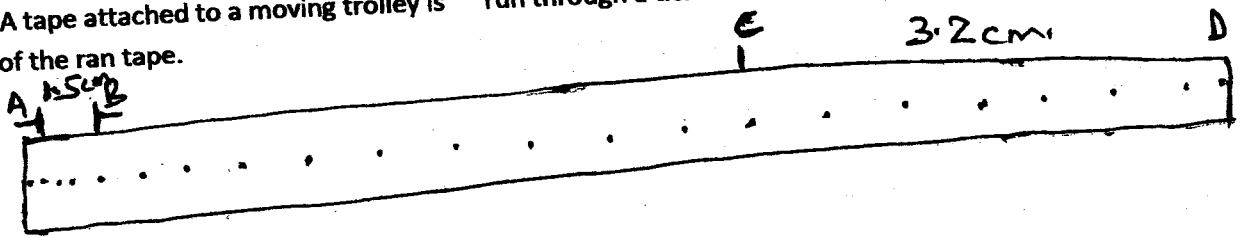
SECTION 'A'

1. The figure below shows a displacement time graph for a wave.



- a) Determine the periodic time (2mks)
- b) Calculate the frequency of the wave. (2mks)
- c) On the same graph sketch a graph of a wave of the same frequency but with half the amplitude. (3mks)

2. A tape attached to a moving trolley is run through a ticker timer. The figure below shows a section of the ran tape.



If the frequency of the ticker – timer is 50Hz, determine the

(4mks)

a) Average velocity at intervals AB and CD,

b) Average acceleration of the trolley.

(4mks)

3. An electric heater is made of a wire of resistance  $100\ \Omega$  and connected to a  $240\ V$  mains supply. Determine the (a) Power rating of heater

(2mks)

b) Current flowing in the circuit.

(2mks

c) Time taken for the heater to raise the temperature of 200g of water from 23oC to 95oC. Take  
 $C_{\text{water}} = 4200 \text{ jkg}^{-1} \text{K}^{-1}$  (2mks

d) The cost of the heater for two hours a day for 30 days if one unit of electricity costs ksh. 5.00  
(2mks

4(i) State one of the Newton's laws of motion.

(2mks

ii) A body resting on a horizontal surface give an initial velocity (u) so that it slides on the surface for some distance before coming to a stop. The table below shows the distances (d) moved by the body in various values of u.

V (m/s)	0.20	0.40	0.60	0.80	1.20	1.20
D (m)	0.007	0.027	0.027	0.110	0.170	0.200

Given that  $v^2 = \frac{20}{d}$  where  $M$  is a constant for the surface, plot an appropriate graph and use it to determine  $M$ . (5mks)

iii) A train of mass 200 tonnes starts from rest and accelerates uniformly at  $0.5 \text{ m/s}^2$ , determine its momentum after moving 100m. (3mks)

5a) State 3 uses of an electroscope. (3mks)

i)

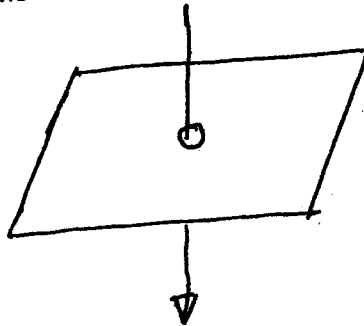
ii)

iii)

b) Explain how you can charge a gold leaf electroscope negatively by an induction. (5mks)

6. A wooden bench and a metal bench are both left in the sun for a long time. Explain why the metal bench feels hotter to touch. (2mks)

7. In the figure below the arrow indicates the direction of the current in the conductor.



Sketch on the diagram the magnetic field pattern due to the current.

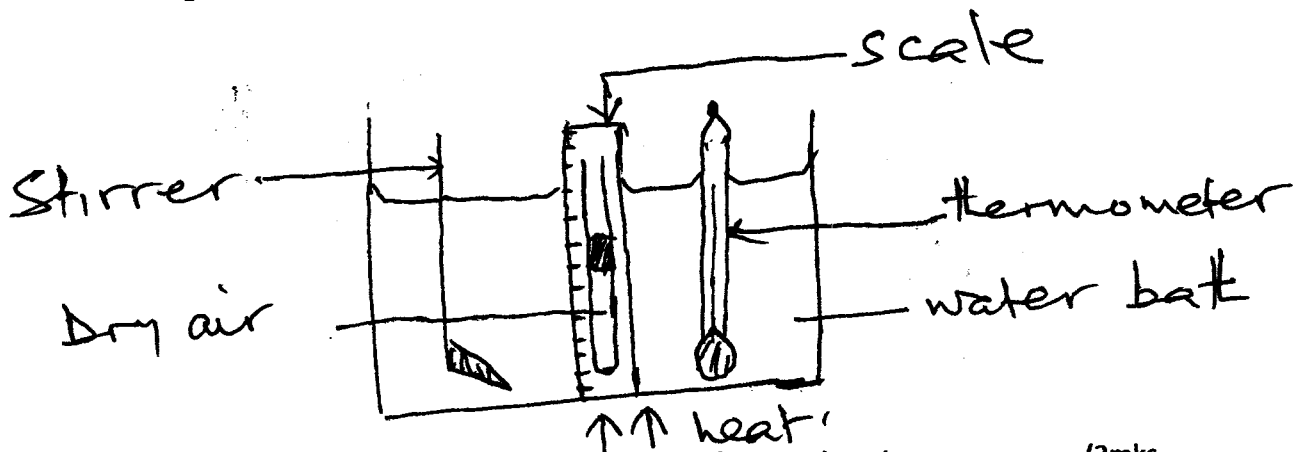
(3mks)

8. Draw a pulley system with two pulleys in each block and show with the aid of a string how the system can be used to lift loads. (4mks)

b) Determine the velocity ratio of the system above. (2mks)

c) If a load of 100N is raised by applying an effort of 28N, determine the efficiency of the system. (3mks)

9. The figure below shows a set up that may be used to verify Charles law.



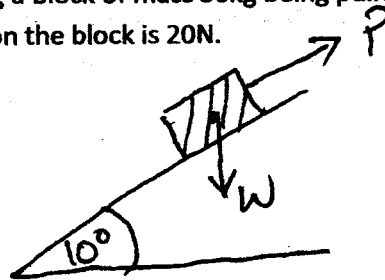
a) State the measurements that should be taken in the experiment. (2mks)

b) What is the purpose of the water bath?

(2mks)

c) A certain mass of hydrogen gas occupies a volume of  $1.6\text{m}^3$  at a pressure of  $1.5 \times 10^5$  pascals and temperature  $12^\circ\text{C}$ . Determine its volume when the temperature is  $0^\circ\text{C}$  at a pressure of  $1.0 \times 10^5$  pascals. (4mks)

10. Below is a diagram showing a block of mass  $30\text{kg}$  being pulled up a slope by a force  $P$  at a constant speed. The friction force on the block is  $20\text{N}$ .

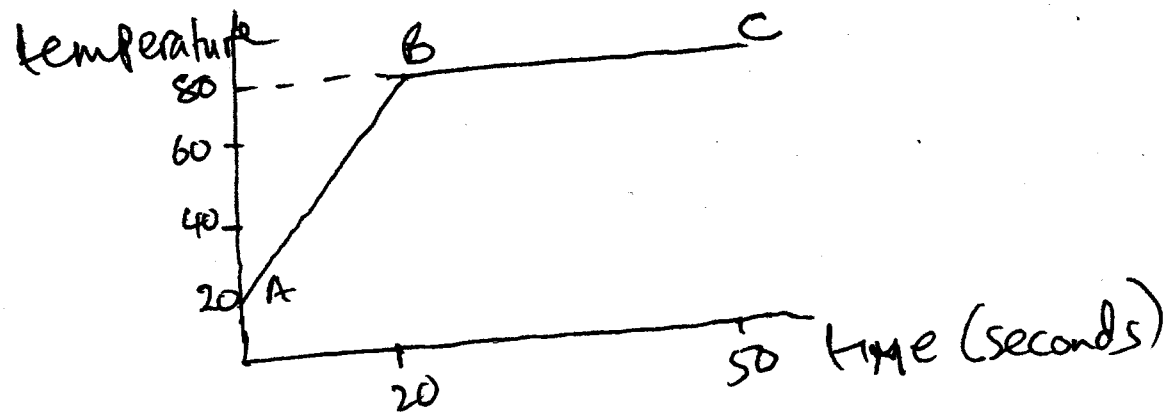


i) On the same diagram indicate and name the other forces acting on the block. (2mks)

ii) What is the effect of increasing the angle of slope. (2mks)

11. A hair drier is rated 2500w, 240V. Determine its resistance. (3mks)

b) The graph below shows the variation of temperature with time when an immersion heater is used to heat a certain liquid. Study the figure and use it to answer the questions that follow.



i) State the reason for the shape of graph in section BC. (2mks)

ii) Sketch on the same axes the graph for another liquid of the same mass but higher specific heat capacity when heated from the same temperature. (3mks)



12. In an experiment to estimate the diameter of an oil molecule an oil drop of diameter 0.05 cm spreads over a circular patch whose diameter is 20cm. Determine

i) the volume of the oil drop. (3 mks)

ii) the area of the patch covered by the oil. (2mks)

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