NAME:……INDEX NO:……..

SCHOOL:…….CANDIDATE'S SIGNATURE:……

DATE:…….

232/1
PHYSICS
PAPER 1 (THEORY)
JUNE-2016
TIME: 2 HOURS

CENTRAL YEARLY MEETING OF FRIENDS (CYMF) -2016

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

232/1
PHYSICS

INSTRUCTIONS TO CANDIDATES

a) Write your name and index number in the spaces provided.
b) Sign and write the date of examination.
*c) This paper consists of two sections **A** and **B**.*
*d) Answer all questions in both section **A** and **B***
e) All workings must be clearly shown.
f) Silent non-programmable electronic calculators may be used.
g) Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing.
h) Candidates should answer questions in English.

FOR EXAMINER'S USE ONLY

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1 - 11	25	
B	12	13	
	13	09	
	14	12	
	15	11	
	16	10	
TOTAL SCORE		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.

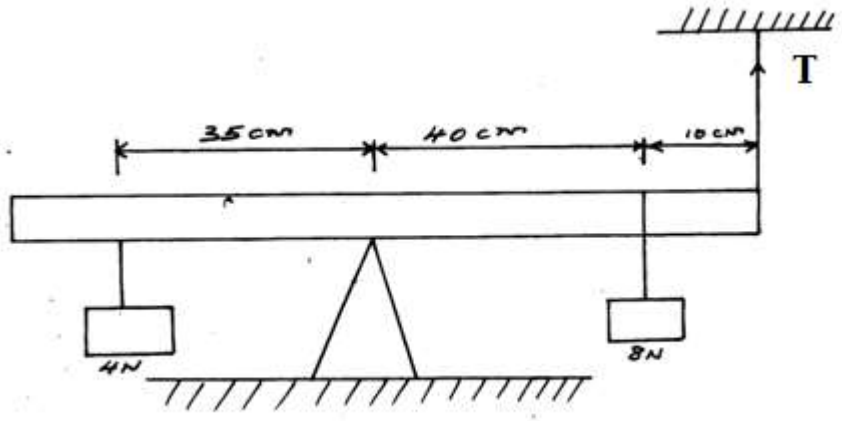
SECTION A (25MKS)

ANSWER ALL QUESTIONS IN THE SPACES PROVIDED

1. Draw a vernier scale to show a reading of 3.14cm. (l mk)

2. A solid weighs 16.5N on the surface of a planet. The force of gravity on the planet is I .7Nkg^{-}.
   Determine the mass of the solid. (2mks)

3. The figure below (figure 1) shows a uniform metal rod balanced at its centre by different forces.



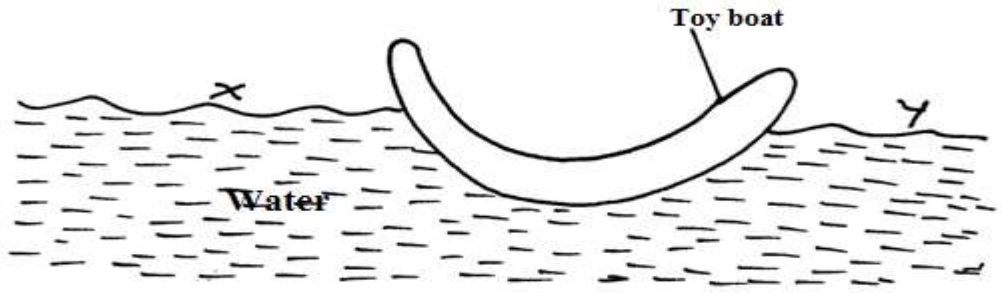
   Determine the value of T. (3mks)

4. An object of weight 40N attached at the end of a spring balance causes an extension of 0.5cm on the Spring.

(a) Determine the force per unit length. (2mks)

(b) Calculate the energy stored in the spring. (2mks)

5. Figure 2 shows a small toy boat floating on water in a basin X and Y are two points near the toy.



When a hot metal rod is dipped into the water at point X the toy is observed to move towards Y. Explain this observation. (2mks)

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6. Two identical tubes, A and B, held horizontally contain air and water respectively. A small quantity of coloured water is introduced at one end of A while at the same time, a small quantity of coloured water is introduced at one end of B. State with reasons the tube in which the colour will reach the other end faster. (2mks)

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7. Analo kicks a ball mass 0.6kg 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 off speed of the ball? (2mks)

8. a) A car starting from rest accelerates uniformly for 5 minutes to reach 30ms^{-}. It continues at this speed for the next 20 minutes and then decelerates uniformly to come to a stop in 10 minutes. Sketch a velocity time(s) graph for the above motion. (1mk)

(b) Determine the distance travelled when the car was decelerating. (2mks)

9. Give two reasons why the efficiency of a pulley system is always less than 100% . (2mks)

i)

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ii)

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10. Mechanics is one of the branches of physics. State what it deals with. (1 mk)

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11. A faulty thermometer reads 22°c when dipped in to pure melting ice and 97°c when in steam. Find the thermometer reading when in a liquid at 60°c . (3mks)

SECTION B (55MKS)

(A*nswer all the questions in this section in the spaces provided*)

12. a) An object is released to fall vertically from a height of 100m. At the same time, another object is projected vertically upwards with a velocity of $40ms^{-1}$.

(i) Calculate the time taken before the objects meet. (3mks)

(ii) At what height do they meet? (2mks)

b) A stone is projected horizontally at a speed of 40m from a cliff 60m high. Calculate the time it takes to strike the ground. (2mks)

c) A string of negligible mass has a bucket tied at its end. The string is 60cm long and the bucket has a mass of 45g. The bucket is swung horizontally making 6 revolutions per second. Calculate:
(i) the angular velocity (1 mk)

ii) Angular acceleration (2mks)

(iii) The tension in the string (2mks)

(iv) The linear velocity (lmk)

13. a) Define the term efficiency of a machine. (l mk)

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b) Figure 3 shows a drum of mass 90kg being rolled up a plane inclined at 25° with the horizontal. The force F applied is 420N and the distance moved by the drum along the plane is 5.2m.

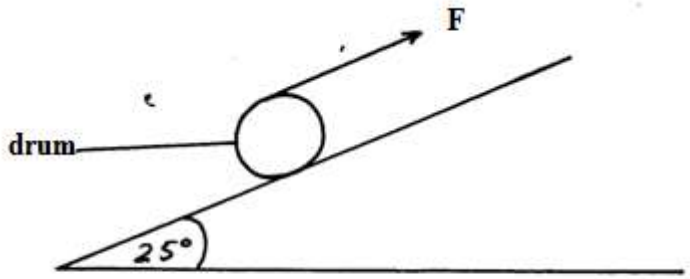

Figure 3

(a) Determine:

(i) The work done by the effort (3mks)

(ii) The work done in raising the drum. (3mks)

(iii) The efficiency of the inclined plane. (2mks)

14. a) Define specific latent heat of fusion of a substance. (l mk)

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b) Water of mass 200g at a temperature of 60°c is put in a well lagged copper calorimeter of mass 80g. A piece of ice at 00 and mass 20g is placed in the calorimeter and the mixture stirred gently until all the ice melts. The final temperature x, of the mixture is then measured.

Take lf=334000Jkg^{-1}, s.h.c (water = 4200Jkg-lk-l and s.h.c for copper =900Jkg^{-}1 k-1. Determine:

(i) the heat observed by the melting ice at 0°. (2mks)

ii) the heat absorbed by the melted ice (water) to raise the temperature to x. (answer may be given in terms of x. (2mks)

iii) the heat lost by the warm water and the calorimeter. (answer may be given in terms of x). (answer may be given in terms of x). (2mks)

iv) the final temperature x of the mixture. (4mks)

v) State any assumption you made in (iv) above. (l mk)

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15. a) State what is meant by an ideal gas.

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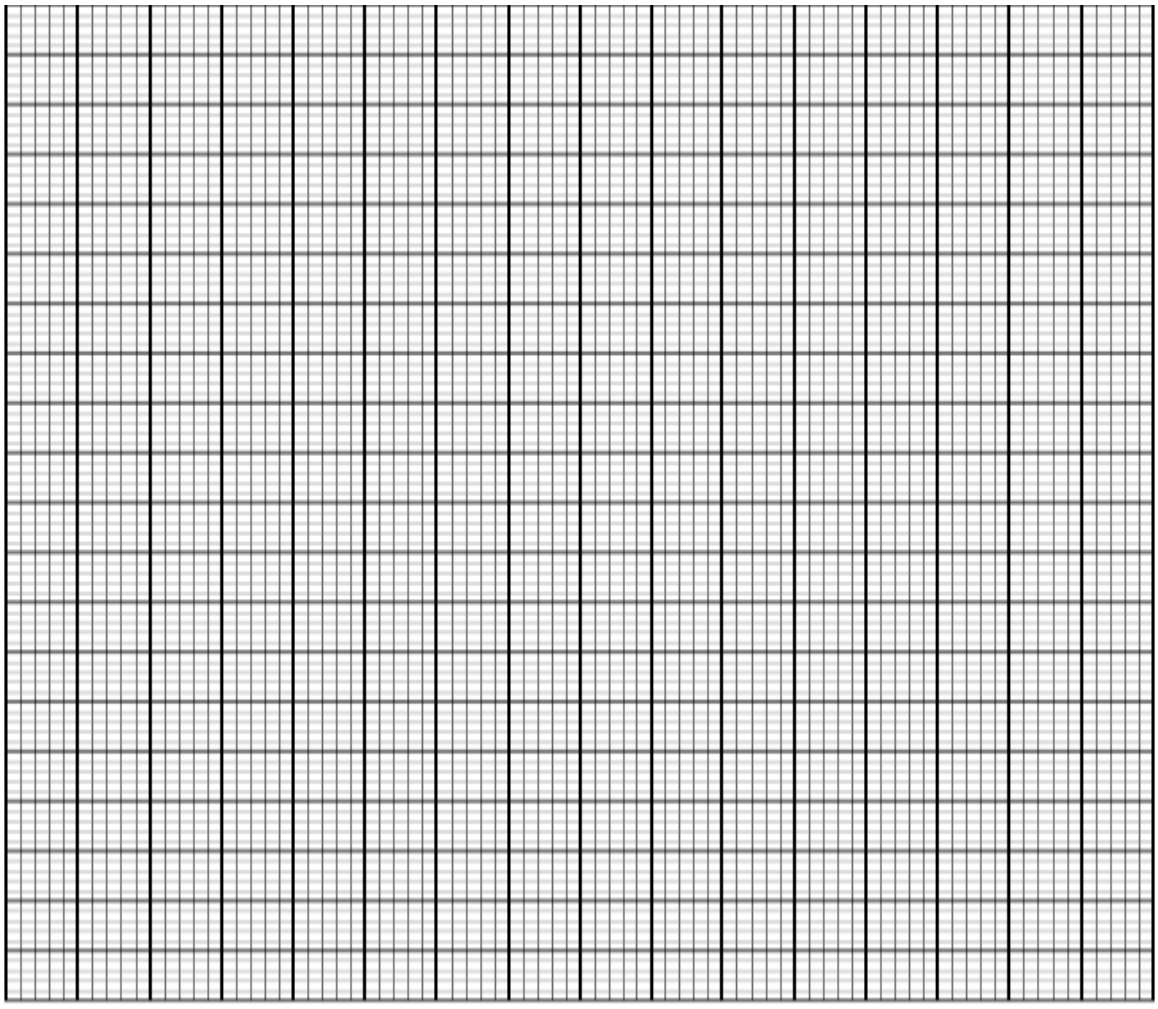
b. The pressure acting on a gas in a container was changed steadily while the temperature of the gas was maintained constant. The value of volume V of the gas was measured for various values of pressure P and the reciprocal of volume $\frac{1}{v}$.



(i) suggest two ways on how temperature of the gas could be kept constant. (2mks)

a)

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b)

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(ii) Given that the relation between the pressure P and the volume V of the gas is given by PV=K, where K is a constant, use of the graph to determine the value of K. (4mks)

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

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

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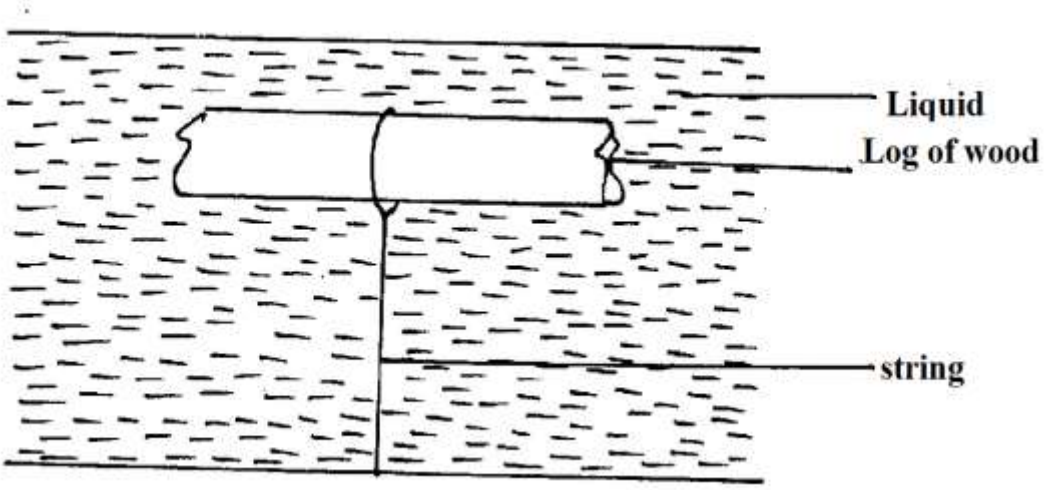
(c) $0.02m^3$ of gas at 27°c is heated at pressure until the volume is $0.03m^3$. Calculate the final temperature of the gas in ^{0}c. (2mks)

16. a) Figure 4 below shows a log of wood of mass 20kg submerged in a liquid of density $1gcm^{-3}$ and held in position by a string fixed to the bottom of a pond.

Given that the density of wood is 800kgm-3 determine:

(i) The volume of the log (3mks)



(ii) The up thrust on the log (2mks)

(iii) Tension in the string (2mks)

c) Figure5 (drawn to scale) shows a section of a tape after passing through a ticker time operated at a frequency of 50HZ-. The tape is attached to a trolley moving in the direction shown.

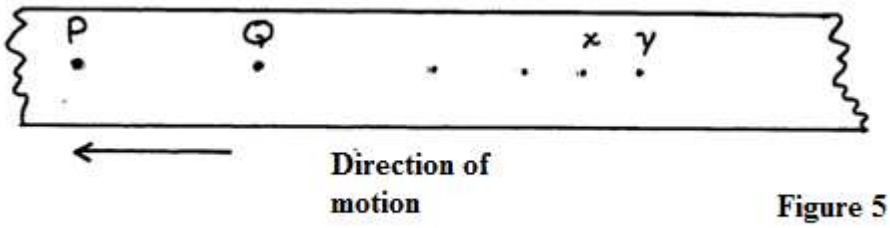


Figure 5

Determine the velocity between P and Q. (3mks)