NAME..... INDEX NO.....

SCHOOL..... CANDIDATE'S SIGNATURE.....

232/1 DATE.....
PHYSICS
PAPER 1
(THEORY)
2 HOURS

TOP NOTCH EXAM MERIT TWO (PRE-MOCK) 2016
KENYA CERTIFICATE OF SECONDARY EDUCATION.

Kenya Certificate of Secondary Education
PHYSICS
PAPER 1
(THEORY)
2 HOURS

Instructions to candidates

1. *Write your name, index number and school in the spaces provided above.*
2. *Sign and write the date of examination in the spaces provided above.*
3. *This paper consist of **TWO** sections; **A** and **B**.*
4. *Answer **ALL** the questions in section **A** and **B** in the spaces provided.*
5. *ALL working **MUST** be clearly shown.*
6. *Non-programmable silent electronic calculators and KNEC Mathematical may be used.*
7. *This paper consists of 12 pages.*
8. *Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing.*

For Examiner's Use Only

Section	Question	Maximum Score	Candidate's Score
A	1-12	25	
B	13	11	
	14	10	
	15	11	
	16	13	
	17	10	
Total Score		80	

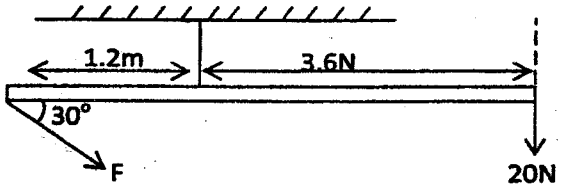
Turnover

SECTION A: (25 MARKS)

Answer ALL questions this section in the spaces provided.

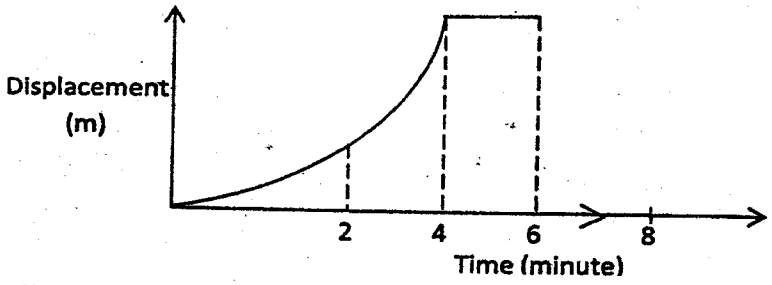
1. What is the reason why trailers carrying heavy loads have many wheels? (1 mark)

2. The figure **below** shows a uniform bar of weight 8N acted on, by two forces, as shown.



Determine the value of F. (3 marks)

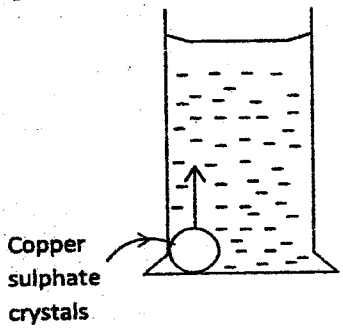
3. The figure **below** shows a motion graph.



Describe the motion. (2 marks)

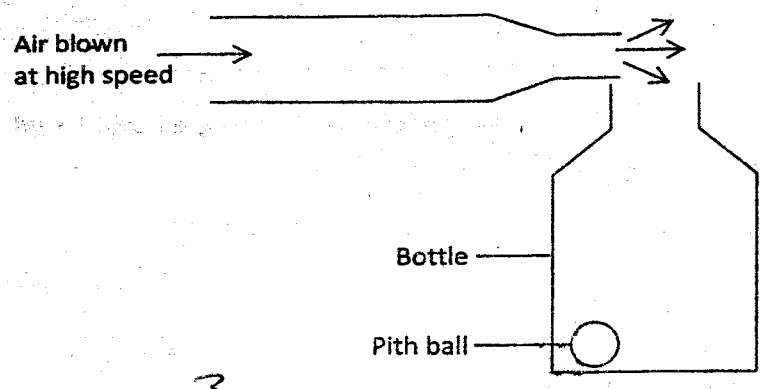
4. State **three** differences between boiling and evaporation. (3 marks)

5. A copper sulphate crystals are placed at the bottom of a tall beaker containing water as shown.



Explain how the copper sulphate particles are able to diffuse to the top parts of water. (2 marks)

6. The figure **below** shows a pith ball at the bottom of a bottle container.



3

State and explain what would happen if the air is blown over the mouth of the container. (2 marks)

7. Calculate the maximum speed at which a car can safely negotiate an unbanked track of radius 70m in icy weather (coefficient of static friction = 0.100). (3 marks)

Distinguish between density and relative density. (1 mark)

9. An ordinary hydrometer of mass 20g floats with 3cm of its stem out of water. The area of cross-section of the stem is 0.75cm². Find the total volume of hydrometer and the length above the surface when it floats in a liquid of relative density 1.4. (4 marks)

10. Why is force referred to as a vector quantity? (1 mark)

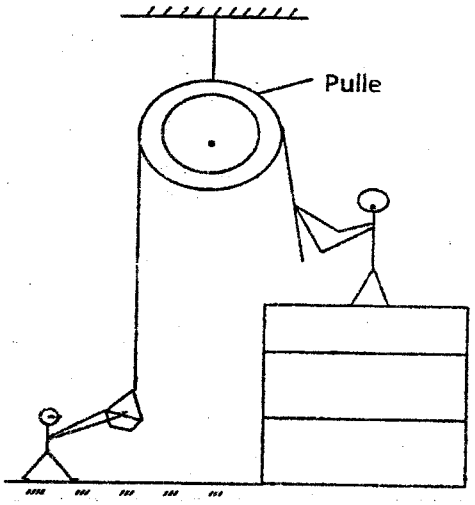
11. A glass stopper is jammed inside the glass neck of a bottle. Explain how it can be loosened. (1 mark)

12. A vernier caliper is used to measure the diameter of a test tube and the reading on the caliper is 3.48cm. If the vernier caliper has a positive error of +0.2mm. Draw a vernier caliper to show the actual diameter of the test tube. (2 marks)

SECTION B: (55 MARKS)

Answer ALL the questions in this section in the spaces provided.

13. The figure **below** shows a pulley system used for lifting.



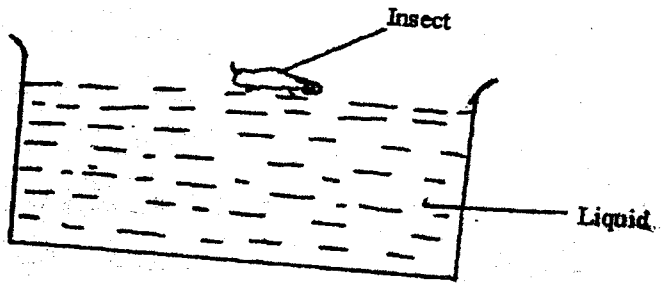
(a) (i) Calculate the work done in raising the load directly if it weighs 300N and has to be raised through a height of 20N. (2 marks)

(ii) Calculate the,work you would do in raising yourself through the same height if you weighed 600N. (1 mark)

(iii) State and explain two good reasons for using a pulley. (2 marks)

(b) If you used a pulley and a force of 350N to raise the load at a steady speed, find the power you would use to raise it through 20M in 35 seconds. (3 marks)

c) The figure shows san insect walking on the surface of a liquid.



(i) What is the name of the force that makes the insect walk without sinking (1mk)

(ii) Explain how the force above can be increased. (2mks)

14. (a) (i) State Newton's second law of motion. (1 mark)

(ii) A driver driving a car of mass 1200kg at a constant speed of 72km/h is flagged down by a traffic police officer. It takes him 2 seconds to react to the police signal and brings the car to rest by applying a constant breaking force in 10 seconds. Determine the minimum stopping distance and the constant breaking force. (5 marks)

(b) A mountain climber with a mercury barometer discovered that the readings of the barometer at the bottom and top of a certain mountain were 750mmHg and 520mmHg respectively. Given that the density of air between the top and bottom of mountain is uniform and equal

to 1.25kgm^{-3}, estimate the height of the mountain. (Take the density of mercury to be 1.36×10^4kg/m^3). (4 marks)

15. (a) Distinguish between heat capacity and specific heat capacity. (1 mark)

(b) A student was provided with the following:

- A power supply (cells).
- A variable resistor
- Weighing balance
- Ammeter
- Voltmeter
- Well lagged metal block.
- Thermometer
- Stop watch.

(i) With the aid of a well-labeled diagram, draw a suitable set-up that he would use to determine specific heat capacity of the metal block. (2 marks)

(ii) State the measurement that would record to obtain the objective. (2 marks)

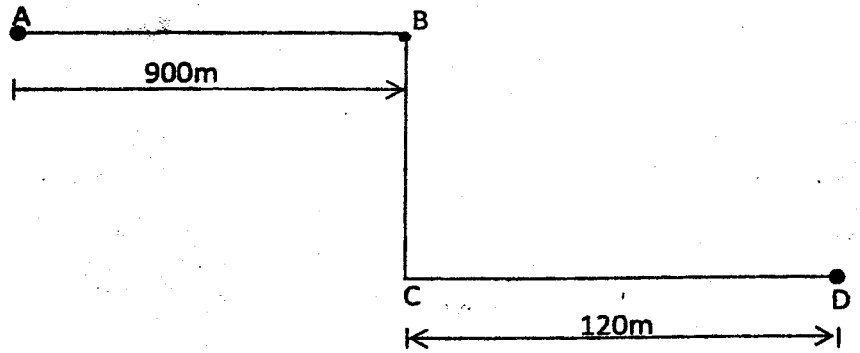
(iii) From the recorded measurements in **(ii) above** deduce the expression for the value of specific heat capacity of the block. (1 mark)

(c) Paul throws a stone from the top of a building 20m high .The horizontal velocity of the stone is 10m/s Calculate:

(i) The time the stone takes to hit the ground. (3mks)

(ii) The distance from the foot of the building to where the stone hits the ground. (2mks)

16. A stun master at point A started racing towards point B on the verge of a cliff at an acceleration of $2m/s^2$. The stun master landed at a distance of 120m from the foot of the cliff at point D as shown.



Given that distance AB is 900m.

(a) Find

(i) the velocity of the body just before the stun master flies. (3 marks)

(ii) the total time taken from point A to point D.

(4 marks)

(iii) the height of the cliff BC.

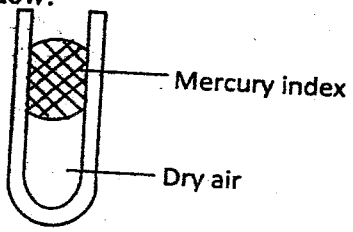
(3 marks)

(b) (i) A student heated two metals of the same length and noted that after some time they measured different temperature. Explain the reason for the difference. (2 marks)

(ii) Explain the reason why a student opening the door close to the hinges finds if difficult.

(1 mark)

17. (a) A thick glass tube has 20cm³ of dry air trapped in it by a 12cm long column of mercury as shown below.



Calculate the new volume of the trapped air if the tube were held horizontally. (Atmospheric pressure = 74.5cmHg and density of mercury = 13600kgm^{-3}). (3 marks)

(b) Explain Charles law of gases using kinetic theory of matter. (2 marks)

(c) **Figure** shows a pressure-temperature graph for an ideal gas.

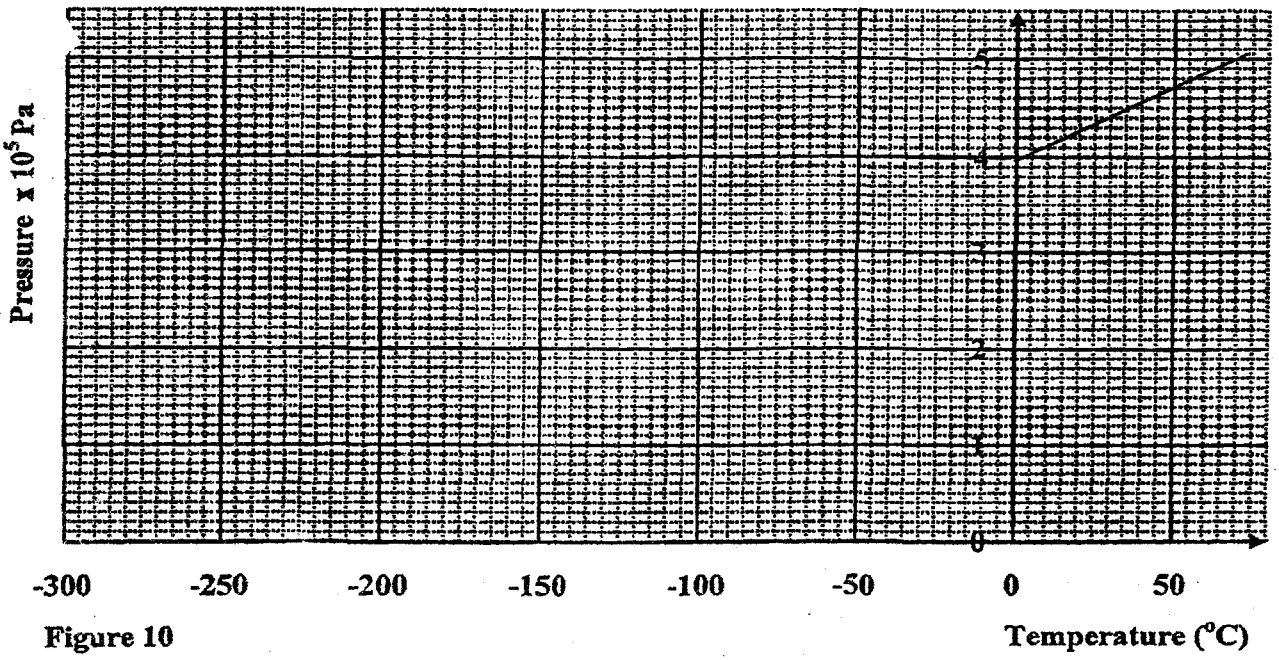


Figure 10

(i) From the graph determine the temperature of the gas when the gas pressure is zero. (2mks)

(ii) Express this temperature in kelvin. (1mk)

c) An object of mass 150 kg moving at 2Oms' collides with a stationary object of mass 90kg. They couple after collision.
Determine the total momentum before collision. (2mks)