Name: …………………………………………………Adm. No: ………………Class:……………..

232/1

PHYSICS
Paper 1
(THEORY)
.
Time: 2 Hours

-
-

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

PHYSICS
Paper 1
Time: 2 Hours

INSTRUCTIONS TO CANDIDATES:-

- *Write your name, index number and class in the spaces provided above.*
- *This paper consists of two sections; A and B*
- *Answer all the questions in section A and B in the spaces provided*
- *All working must be clearly shown.*
- *Mathematical tables and electronic calculators may be used*
- *This paper consists of **9** printed pages. Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing.*
- *Candidates should answer the questions in English.*
- *Take g=10N/kg*

For Examiner's Use Only:

Section	Question	Maximum Score	Candidate's Score
A	1 – 13	25	
B	14	11	
	15	9	
	16	11	
	17	11	
	18	13	
Total Score		80	

SECTION A: 25mks (Answer all the questions)

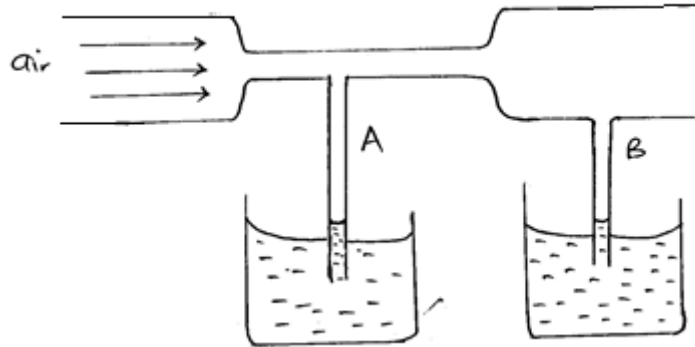1. State one assumption made when determining the size of a molecule in an oil drop experiment

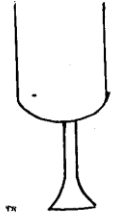2. Air is blown into the horizontal tube as shown below.

   (a) Indicate the levels of water in tubes A and B when air passes through the horizontal tube at a high velocity. (1 Mark)

   (b) Explain your observation in (a) above (1 Mark)

3. Sketch a velocity – time graph of a body moving with uniform velocity. (1 Mark)

4. The figure below shows an empty wine glass.
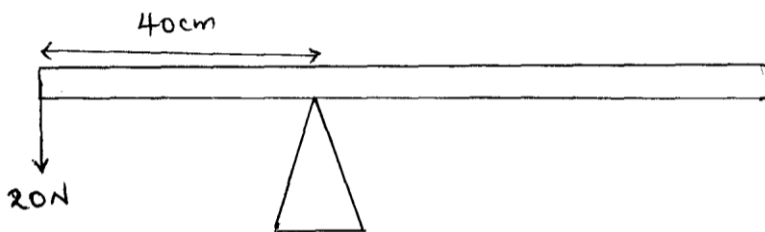
a. How is its stability affected when filled with wine?   (1 Mark)
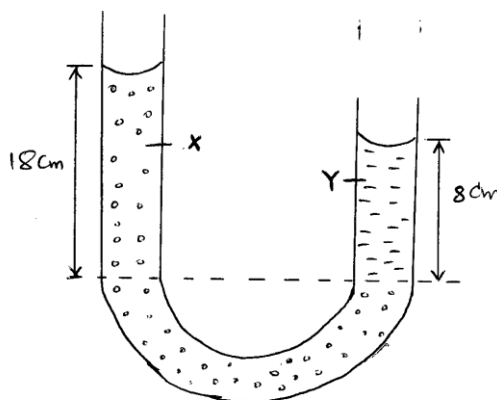
b. Explain the observation in (a) above   (1 Mark)

5. State one factor that affects heat transfer in solids.   (1 Mark)

6. The figure below shows a uniform bar of length 1 metre. Calculate the weight of the bar.   (3 Marks)

40cm

20N

7. The figure below shows a u-tube containing the liquids X and Y. Given that the density of liquid X is 1.8g/cm³, calculate the density of liquid Y in g/cm³. (3 Marks)

8. Name one factor that affects surface tension. (1 Mark)

9. When a liquid is heated in a glass flask, its level first falls and then starts rising. Explain this observation. (2 Marks)

10. The figure below shows two identical springs with negligible weight. The extension produced on the system is 10cm.
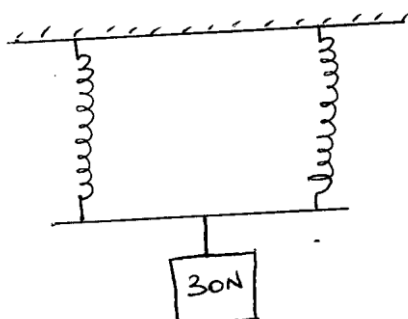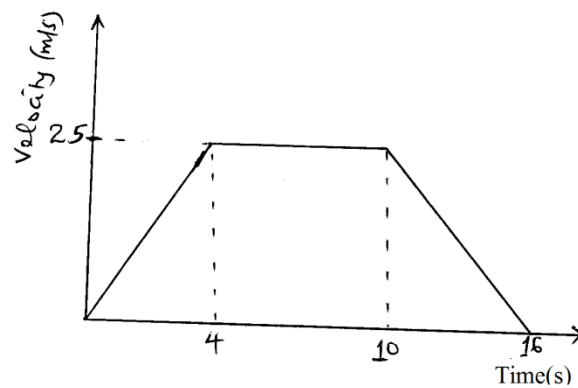

Determine the spring constant of each spring. (3 Marks)

11. A body A of mass 2kg moving with a velocity of 5m/s collides with a body B of mass 30kg travelling at 2m/s in the opposite direction. If the collision is perfectly inelastic, find their common velocity after collision. (3 Marks)

12. The figure below shows a velocity time graph for a trolley

From the graph, calculate the distance covered by the trolley in the first 10 seconds (2 Marks)

13. State the reason why gases are easier to compress than solids. (1 Mark)

14. a.   State the Hooke's law   (1 Mark)

b.   The table below shows the extension produced in a spring by various forces.

Extension (cm)	0	0.3	0.7	1.10	1.5	1.9
Force (N)	0	1.0	1.9	3.0	4.1	5.0

i.   Plot a graph of force against extension.   (5 Marks)

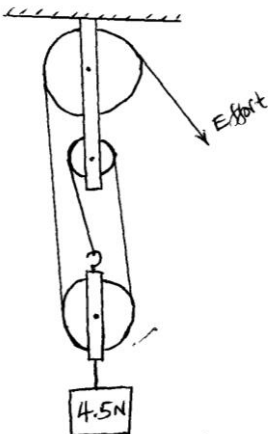ii. From the graph, determine the spring constant.   (3 Marks)

iii. What force would cause an extension of 1.2cm on the spring?   (2 Marks)

15. The figure below shows a block and tackle system

(a) State the velocity ratio of the system   (1 Mark)

(b) Mark the direction of tension in the strings   (1 Mark)

(c) If an effort of 2N is applied, calculate the mechanical advantage of the system.   (3 Marks)

(d) Calculate the efficiency of the system.   (3 Marks)

(e) State why the efficiency of the system is less than 100%.   (1 Mark)

16. A body of mass 2kg is thrown vertically upwards with a velocity of 14m/s. Determine;
    (a) The maximum height reached by the body   (3 Marks)

    (b) Its velocity after 0.5 seconds.   (3 Marks)

    (c) The time taken to reach maximum height.   (3 Marks)

    (d) Calculate the net force acting on the ball as it moves upwards if it experiences an air resistance of
        8N.   (2 Marks)

17. a. State the Newton's 2nd law of motion   (1 Mark)

    b. A lady of mass 90kg is standing on the floor of a lift. Determine the reading on the weighing machine when
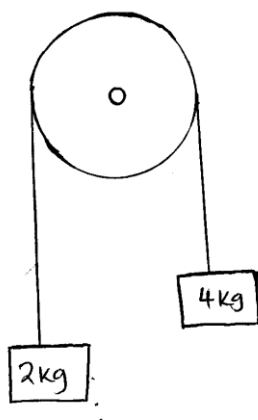   i. Lift is at rest   (2 Marks)

        ii. Lift is moving upwards with an acceleration of 3m/s^2 (2 Marks)

    c. Two masses of 4kg and 2kg are connected by a light string passing over a frictionless pulley as shown below.
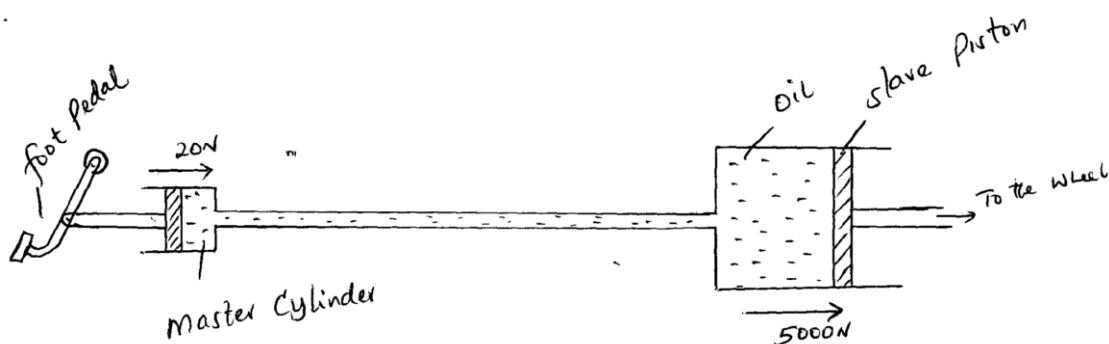

        Calculate the acceleration of the masses when left to move freely.   (3 Marks)

d. A block of mass 35kg is pushed along a horizontal surface whose frictional force is 20N. If the force moving the block is 100N, calculate the co-efficient of friction between the block and the surface.

(3 Marks)

18. The figure below shows a hydraulic brake system.

A force of 20 N is applied on the foot pedal connected to a piston of area 0.05m^2. This causes a stopping force of 5000N on one wheel. Calculate.

a. Pressure in the master cylinder (3 Marks)

b. Area of the slave piston. (3 Marks)

c. Velocity ratio of the system. (3 Marks)

d. Give two reasons why oil is used in the hydraulic brake system. (2 Marks)

e. State two factors affecting pressure in liquids.   (2 Marks)