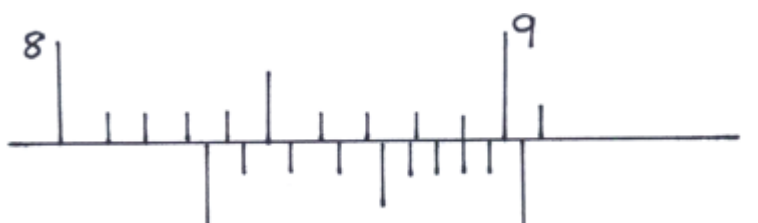# KCSE CLUSTER TESTS 11

Physics Paper 1

SECTION A (25 Marks)

1. State the reading above on the instrument below used to measure length.

 2 marks

2.

Explain briefly how the temperature in a green house is kept higher than outside.

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 2 marks

3.

Explain why the weight of a body varies from place to place.

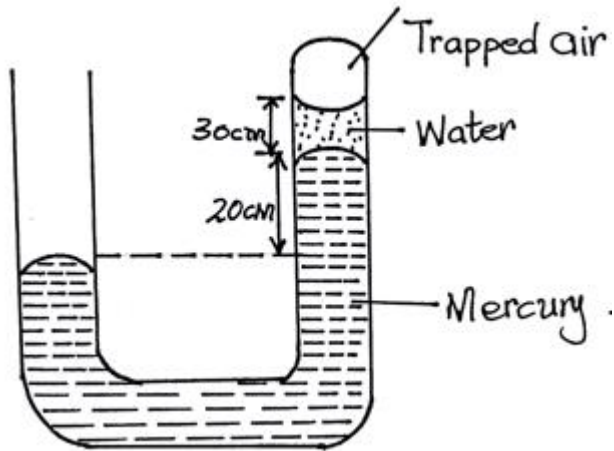..
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 1 marks

4.

State and explain one factor that enhances accuracy in clinical thermometers.

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 2 marks

5.

The figure below shows a manometer that is closed at one end. Study it and answer the question that follows:

Determine the pressure of the trapped air.

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 3 marks

6.

A stone 0.5 kg was tied to a string that was 120cm and whirled in a horizontal circle at a rate of 150 rev/minunte,
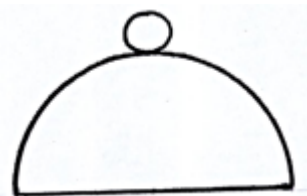
Determine :-

i) The periodic time T of the motion.
ii) The angular velocity ω of the motion.

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 3 marks

7.

The figure below shows a marble placed on an inverted bowl.

State and explain the type of equilibrium the marble is in.

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2 marks

8.

The diagram below shows water flowing steadily in a tube of varying cross-sectional area.

$120cm^2$ $40cm^2$
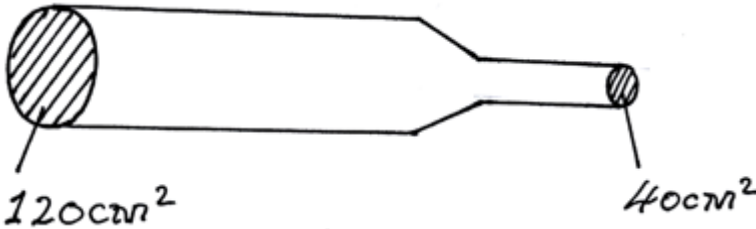
Study it and answer the questions that follows:-
If the velocity of the wider section is 0.4m/s, what is the velocity in the narrower section?

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2 marks

9.

Describe the motion represented by the following graph.
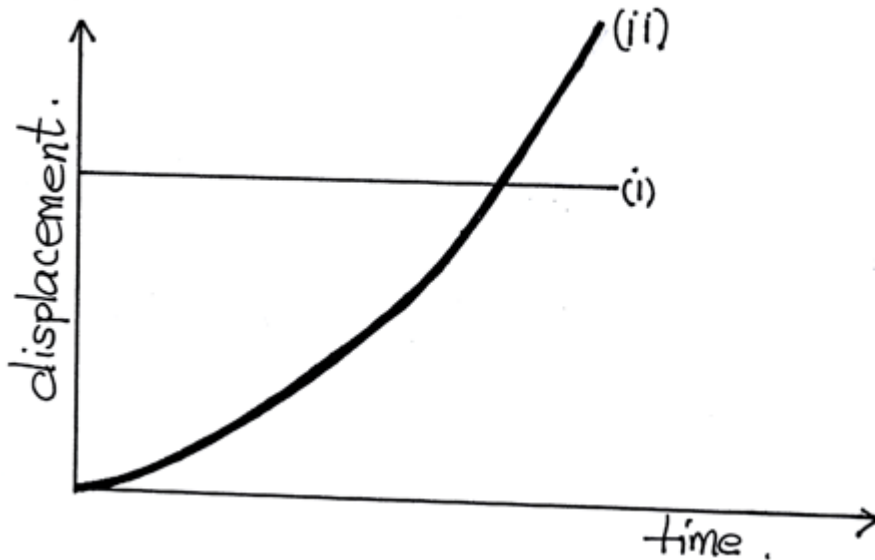
2 marks

10.

A body of mass 4.0kg is moving at 12 m/s before colliding with stationary body of mass 60. Kg.If the bodies stick together, what is the common velocity with which they move?

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11.

Distinguish between heat capacity and specific heat capacity.
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SECTION B (55 Marks)

12.

a) State the Charles' law of gases.
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b) The set up below was used to verify the Charles' law.
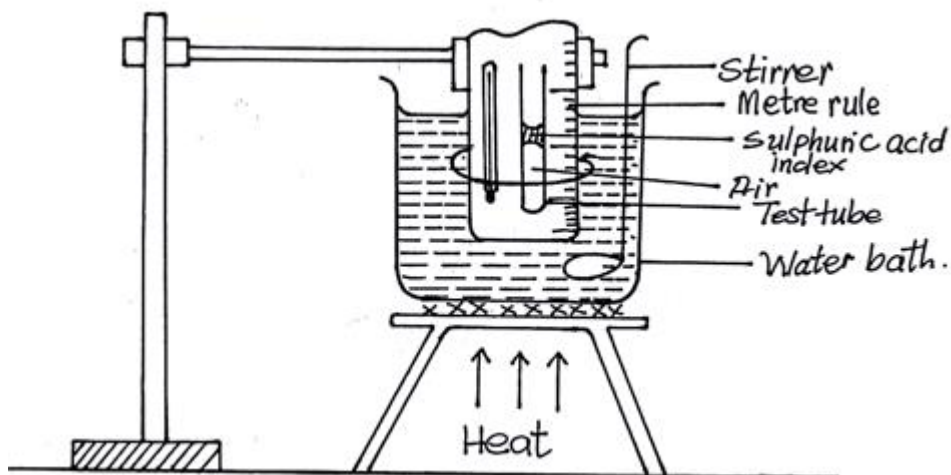
Describe how the apparatus are used to verify the Charles' Law
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ii) What are the two purposes of the sulphuric acid index?
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iii) Why is the atmospheric pressure not taken into account in this experiment?

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iv) What physical property of the gas is kept constant in this experiment?

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8 marks

13.

a) Define the specific latent heat of fusion.

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b) 2 g of dry ice was added to 400 g of water at 69^0c in a copper calorimeter of mass 1200 g. The calorimeter was then returned to the jacket and the mixture stirred well till the ice melts. It was found that the steady temperature of the mixture was now 68.4^0c.Gicven that the specific heat capacity of water is $4200Jkg^{-1 k-1}$ and that of copper is $400Jkg^{-1k-1}$

i) Calculate the heat lost by the calorimeter.
ii) Calculate the lost heat by water of mass 400g.
iii) Write an expression for the heat gained by the ice to melt and for temperature to rise to 68.4^0c.

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iv) Calculate the specific latent heat of fusion of ice.

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11 marks

14.

a) Define the term efficiency of machine.

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b) The figure below shows a drum of mass 90kg being rolled up a plane, inclined at 25^0 to the Horizontal .The force F applied is 420N and the distance covered by the drum along the plane is 5.2m.
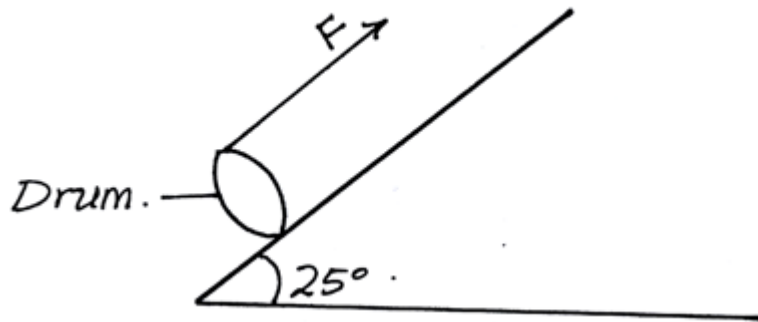
Calculate:

i) The work done by the effort.

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ii) The work done in raising the drum.

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iii) The efficiency of the inclined plane as a machine.

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 8 marks

15.

a) State the law of floatation.

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b) The figure shows a balloon made of fabric weighing 3.5kg and negligible volume. Its capacity is $100m^3$.It is filled with hydrogen of density 0.09kg/m3 and is floating in air of density 1.2 k g/m^3
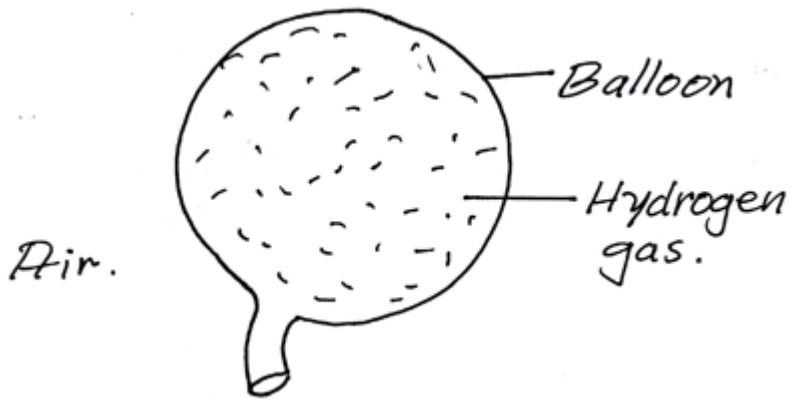
Calculate

i) The up thrust on the balloon.

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ii) Weight of hydrogen.

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iii) Lifting force on the balloon.

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 9 marks

16.

a) State Newton's second law of motion.

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b) A matatu starts from rest and accelerates to cover a distance of 49 m in 7 seconds.

Determine:-
i) Its acceleration

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ii) Its velocity after 7 seconds.

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c) A trolley moving on a horizontal bench of height 1.2 m strikes a barrier at the edge of the bench and brass mass on the top of the trolley flies off on impact and lands on the ground 2.5m from the edge of the bench.

i) Determine the time taken by the brass mass to reach the ground.

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ii) The speed at which the trolley struck the barrier.

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 10 marks

17.

A student set up experiment to study the acceleration of a trolley using ticker tape timer. The timer made 50 dots per second on the tape. Dots A to E measured 2.5 cm apart and dots E to I measured 3.5 cm apart.

a) Using a scale drawing show the dots A, B, C, D, E, F, G, and I as they appeared on the tape.

b) What is the velocity of the trolley from:-

i) A to E

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ii) E to I

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c) Calculate the acceleration of the trolley.

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 9 marks