PHYSICS FORM 3

KAGONDO SECONDARY SCHOOL
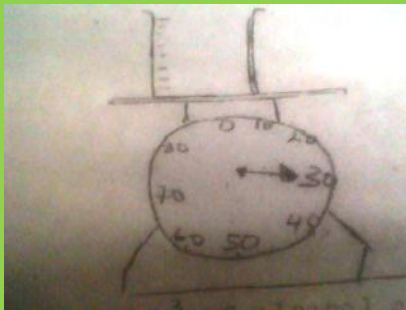
END YEAR EXAM 2011

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SECTION A (25 MKS)

Answer all questions in this section in the spaces provided

1.The figure below shows an empty beaker placed on top of a pan balance, calibrated in grams

25cm³ of alcohol of density 0.8 g/cm³ was added to the beaker. Indicated the new position of the pointer (2mks)

2.A glass funnel is dipped in a soap solution, then taken out and blown gently to form a soap bubble as shown below. Explain why the bubble flattens then rises (2mks)
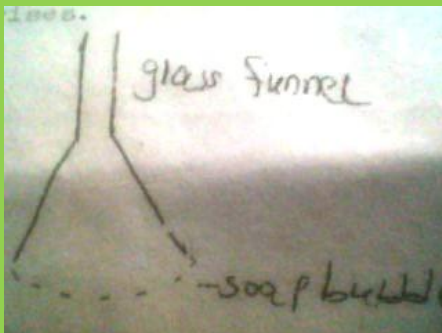
3.A tin with a hole is filled with water to a certain height. Water jets out as shown in the figure (a) below. A second identical tin is filled with water to the same height and a wooden block floated as in figure (b)
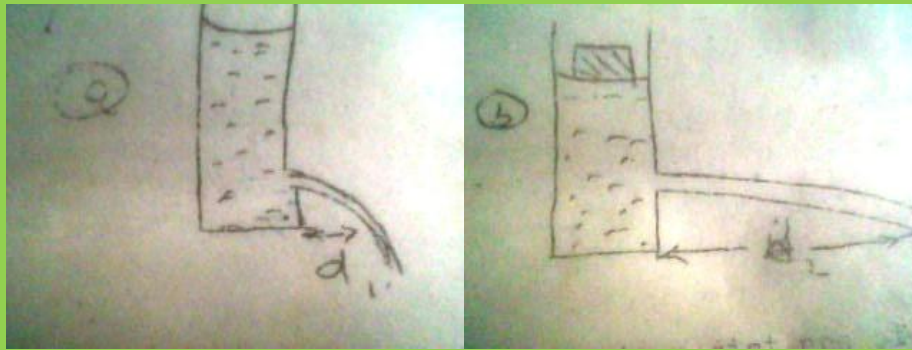
State the reason why the maximum distance of the jet d2 is greater than d1 (1mk)

4.In the study of Brownian motion using the smoke cell, the smoke particles observed through the microscope were seen to move in zigzag radomn motion. Explain this observation (1mk)

5.The area of constriction in a horizontal pipe is 24cm², if the speed of water in the wider part of the pipe is 6m/s and in the constriction is 9m/s.Find the diameter of the wider part of the pipe (3mks)

6.The figure below shows two identical beakers A and B.Beaker A contains water at 0°c while beaker B contains water and pieces of ice at 0°c.Both contents have the same mass.Two identical metal blocks are removed from the same hot furnaces and dropped into each of the beakers at the same time
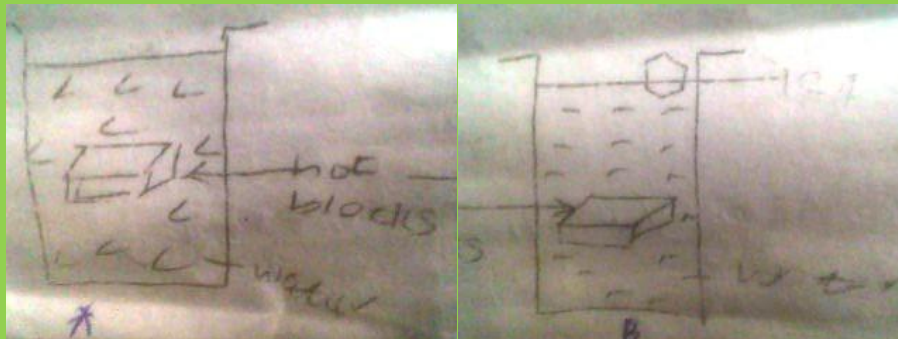
Identify which of the two beakers would experience more evaporation and give a reason for your answer (2mks)

7.The figure shown below is a thermometer which operates using a bimetallic strip, and gears. Study the figure and answer the questions that follow
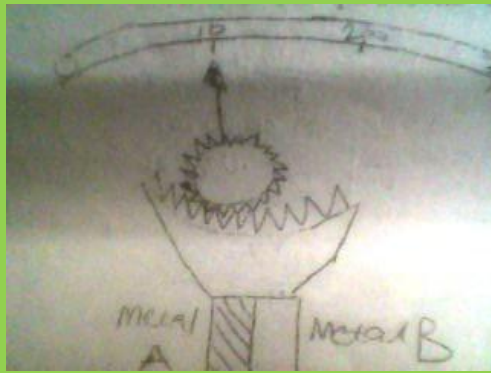
i)Compare the thermal expansivity of Metal A and B for the same temperature (1mk)

ii)Briefly describe how the thermometer works (2mks)

8.The figure below shows a uniform meter rule of mass 300g pivoted at 0 cm mark and kept horizontally by a string fixed at 55 cm mark.
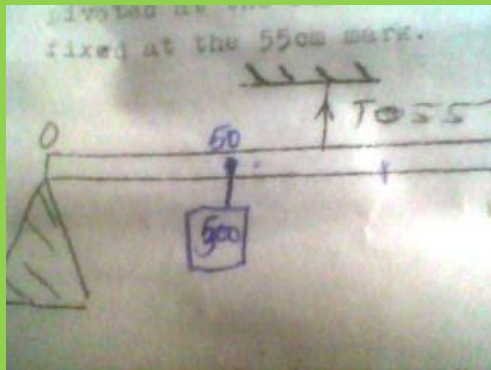
Determine the tension on the string (3mks)

9.The figure 7 below two identical iron rods one placed on a wooden block and the other on a metal block. The ends of the rods were heated as shown
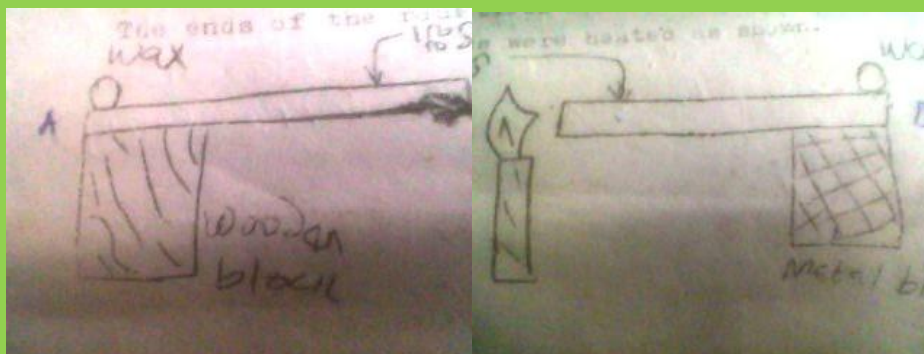
State with reason the piece of wax that melts first (2mks)

10.On an axis sketch a graph of extension against force for a material that obeys ohms law (1mk)

11.Some students went to a show and saw an extraordinarily tall man as shown in the figure below. They observed that the man could not walk fast otherwise would fall. Explain (1mk)
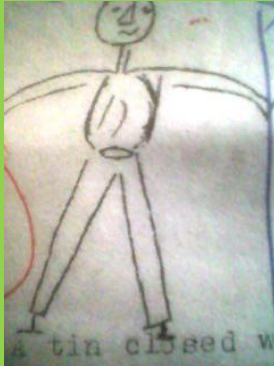
12.A tin closed with an airtight lid contains air at a pressure 1.0×10^5 and at 12^oc.The tin is then opens at a temperature of 8^oc, determine the pressure at that point.(2mks)

SECTION B

Attempt all questions provided in this section

13.a)i)State Newton's second law of motion (1mk)

ii)Define momentum (1mk)

b)A lorry of mass 20 tones travelling at 27 km/hr. collides with a pickup of mass 3 tones travelling at 100km/hr. in the opposite direction. The two stick together and move in one direction. Calculate the speed of the two vehicles after collision (3mks)

c)A force F is exerted on a mass of 2 kg as shown in figure below. If the coefficient of static friction 0.26, determine the frictional force on the mass (2mks)

d)A dart player stands 3 m from a wall on which the board stands and throws a dart horizontally which leaves his hands at a point 1.95m above the ground. If the dart hits the board 1.5 m above the ground and assuming no air resistance

i)determine the time of flight of the dart (3mks)

ii)Determine the initial velocity of the dart (2mks)

14.The apparatus in the figure below shows a large glass bulb in equilibrium with a standard mass in a bell jar connected to a vacuum pump
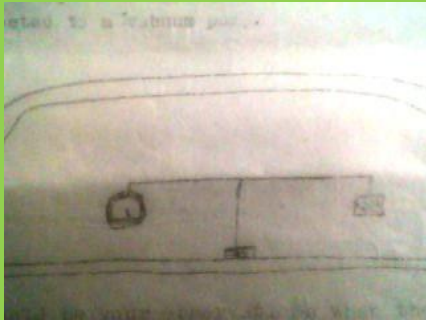
a)what would be your observations when the air in the bell is removed?(1mk)

b)Give a reason for your observation (1mk)

c)A bullet of mass is fired horizontally into a block of wood of mass 600g.The block is suspended from strings so that it is free to move in a vertical plane .The bullet and the block rises together through a vertical distance of 8.6 cm as shown in the figure below
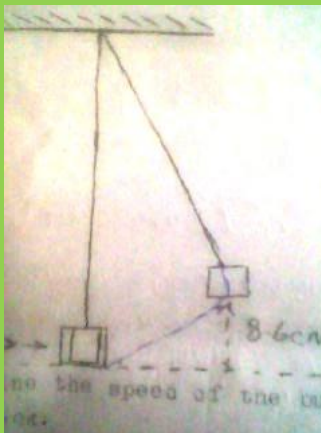
Determine the speed of the bullet before the impact with the block (3mks)

15.a)Draw a diagram of a pulley system having a v,R of 5 (2mks)

b)A man uses this pulley to raise a load at a stealthy speed of 0.1m/s.He applies an effort of 120N.What power does he develop (2mks)

c)Give two reasons for the pulley system being less than the efficiency (2mks)