Name:.. Index No. ....

Date: .... Sign........................

232/1

PHYSICS

PAPER 1

JULY /AUGUST 2013

TIME: 2 HOURS

SUBUKIA DISTRICT JOINT EXAMINATIONS

Kenya Certificate of Secondary Education 2013

232/1

PHYSICS

PAPER1

JULY /AUGUST 2013

Instructions to candidates;

- ❖ Write your name, index number and name of your school in the spaces provided.
- ❖ This paper consists of two parts **A** and **B.**
- ❖ Answer all questions in sections **A** and **B** in the spaces provided.
- ❖ All working **MUST** be shown in the spaces provided after questions.
- ❖ Mathematical tables and electronic calculators may be used.

For examiners use only

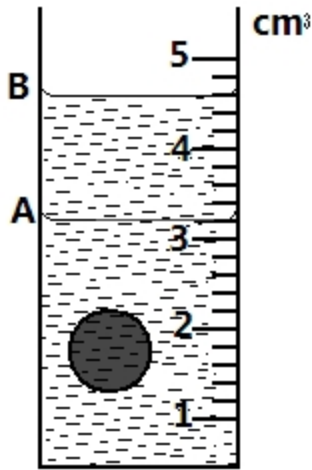| Section	Question	Maximum score	Candidates score
A	1-14	25	
B	15	11	
	16	13	
	17	11	
	18	10	
	19	10	
	Total score	**80**	

Answer ALL the questions in the spaces provided.

1. The figure below shows a   measuring cylinder which contains water initially at a level A. A spherical solid of mass 11g is immersed in the water, the level rises to B.

   Determine the diameter of the spherical ball   (2 marks)

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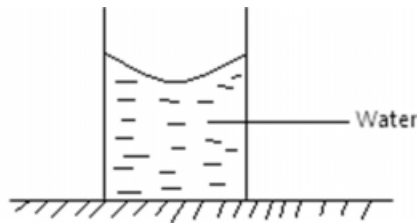
2. Explain the reason why a dropping dust particle in a still room does not trace a straight vertical path   (1 mark)

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3. The figure 2 below shows a beaker containing water placed on a flat bench.

   Fig. 2

   State and explain the changes in stability of the beaker when the water freezes to ice

   (2 marks)

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4. Figure 3 below shows a solid sphere moving on a platform 5cm above the ground. It rolls down a curved frictionless path in a point 0.5m above the ground.

Fig. 3

5m

0.5m
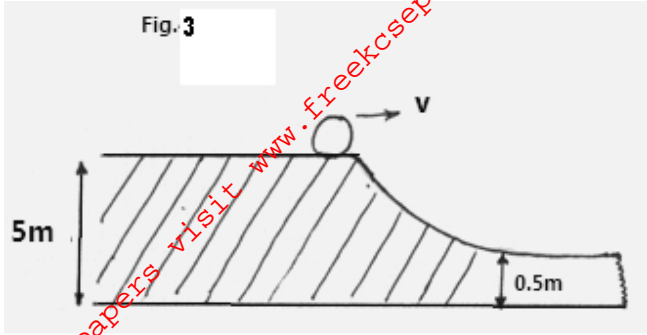
Calculate its velocity at the lower point   (3 marks)

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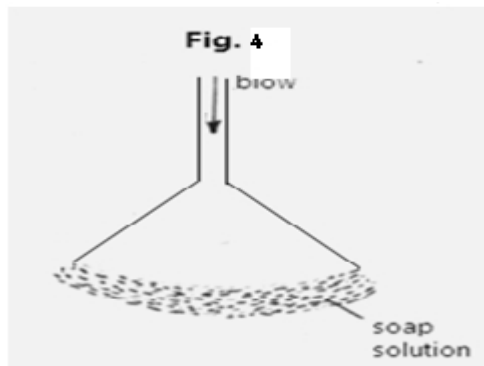
5. Two table tennis balls hang at the same level suspended from a thread a short distance apart. A stream of air is blown between the balls. Explain what happens to the balls.   (2 marks)

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6. Figure 4 shows a bubble of soap blown to the wider end of a funnel.

Fig. 4

blow

soap solution

When the top is left open the bubbles flatten to a film which rises up the funnel. Explain observation.   (1 mark)

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7. State *two* advantages of a force pump over lift pump. (2 marks)

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8. Using the kinetic theory of gases, explain why air inside a tyre exerts pressure on the walls of the tyre. (2 marks)

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9. When ice is heated, the temperature remains constant until all ice is melted. Explain this observation. (1 mark)

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10. A uniform half meter rule is supported by force of 3N and 2N as shown in figure 5 below.

Fig.5
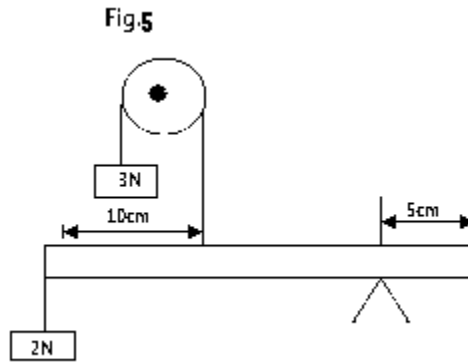
Determine the weight of the half meter rule (2mrks)

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11. A high jumper usually lands on thick soft mattress. Explain how the mattress helps in reducing the force of impact (1 mark)

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12. A particle starts from rest and accelerates uniformly in a straight line. After 3 seconds, it is at a distance of 9m from the starting point. Determine the acceleration of the particle. (3 marks)

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13. A turntable of radius 8 cm is rotating at 30 revolutions per second. Determine the linear speed of a point on the circumference of the turntable. (3 marks)

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14. a) The figure below shows the length of a wooden block being measured.
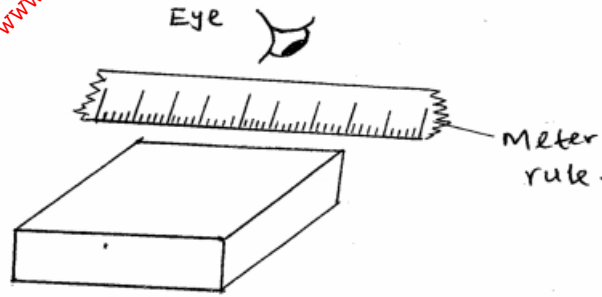
State two errors made while taking the measurement above. (2marks)

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b) In determining the size of 1molecule of oil a single drop of the oil was dropped from a burette on a tray and it is spread to form a circular patch of diameter 20cm. If 1 molecule of oil is assumed to be 1.67×10^{-8}m thick, determine -;

i) The area of the circular patch on the tray. (2 marks)

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ii) The volume of 1 drop of the oil from the burette. (2 marks)

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iii) The radius of the drop from the burette. (2 marks)

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iv) If 10 similar drops from the burette weigh 4.984 x 10⁻⁵N, calculate the density of the oil.   (2 marks)

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15. a) State two factors that affect the efficiency of a pulley system.   (2 marks)

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b) Sketch a labeled diagram to show how arrangement of a single pulley may be used to provide a velocity ratio of 2.   (2 marks)

c) The figure below shows a pulley system with the load rising at uniform speed.
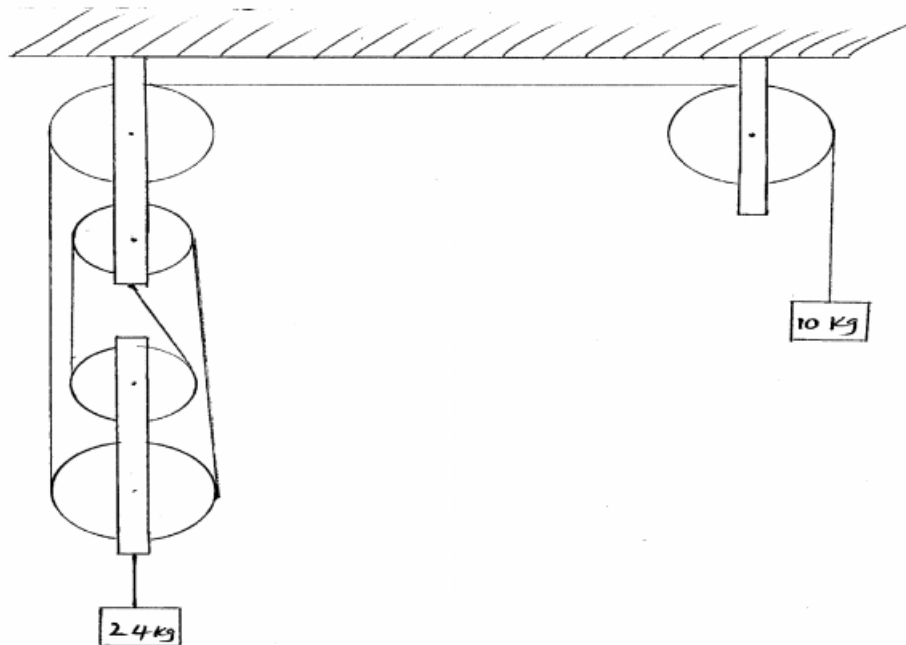
From the information given calculate;

i) Velocity ratio of the machine (1 mark)

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ii) Mechanical advantage of the machine. (2 marks)

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iii) Efficiency of the machine. (2 marks)

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d) The handle of the screw- jack in the figure below is 42cm long and the pitch of the screw is 0.5cm.
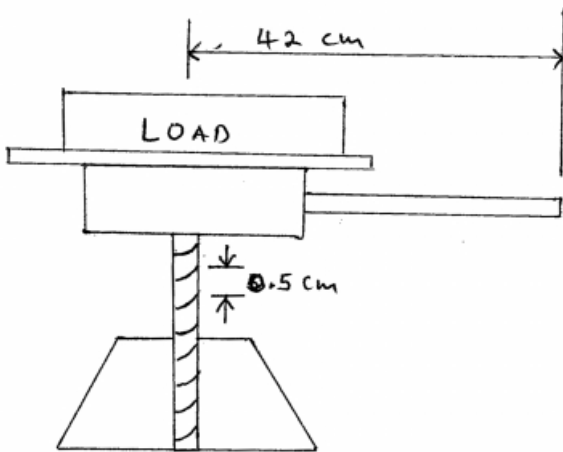
What force must be applied at the end of the handle when lifting a load of 1188N if the efficiency of the jack is 50%? (4 marks)

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16. a) Define the term 'heat capacity' (1 mark)

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b) A block of metal of mass 150g at a 100^0C is dropped into a well rugged calorimeter of mass 215g and heat capacity 400JKg^{-1}K^{-1} containing 100g of water at 25^0C. The temperature of the resulting mixture is 34^0C. (Specific heat capacity of water = 4200JKg^{-1} K^{-1}). Determine;

i) Heat gained by calorimeter. (2 marks)

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ii) Heat gained by water. (2 marks)

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iii) Heat lost by the metal block. (2 marks)

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iv) Specific heat capacity of the metal block. (3 marks)

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c) State two factors that affect the rate of cooling of a liquid. (2 marks)

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17. a) Explain the following observation:-

Ice cubes float on water and solid benzene sinks in liquid benzene. (2 marks)

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b)   i) You are provided with the following:-

An overflow can

A beaker

A spring balance

A metal block

Water and

A String

Describe an experiment to verify Archimedes principle. (5 marks)

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ii) A block of wood weighing 2.0N is held under water by a string attached to the bottom of a container. The tension on the string is 0.5N. Determine the density of the wood. (3 marks)

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18. a) Define angular velocity. (1 mark)

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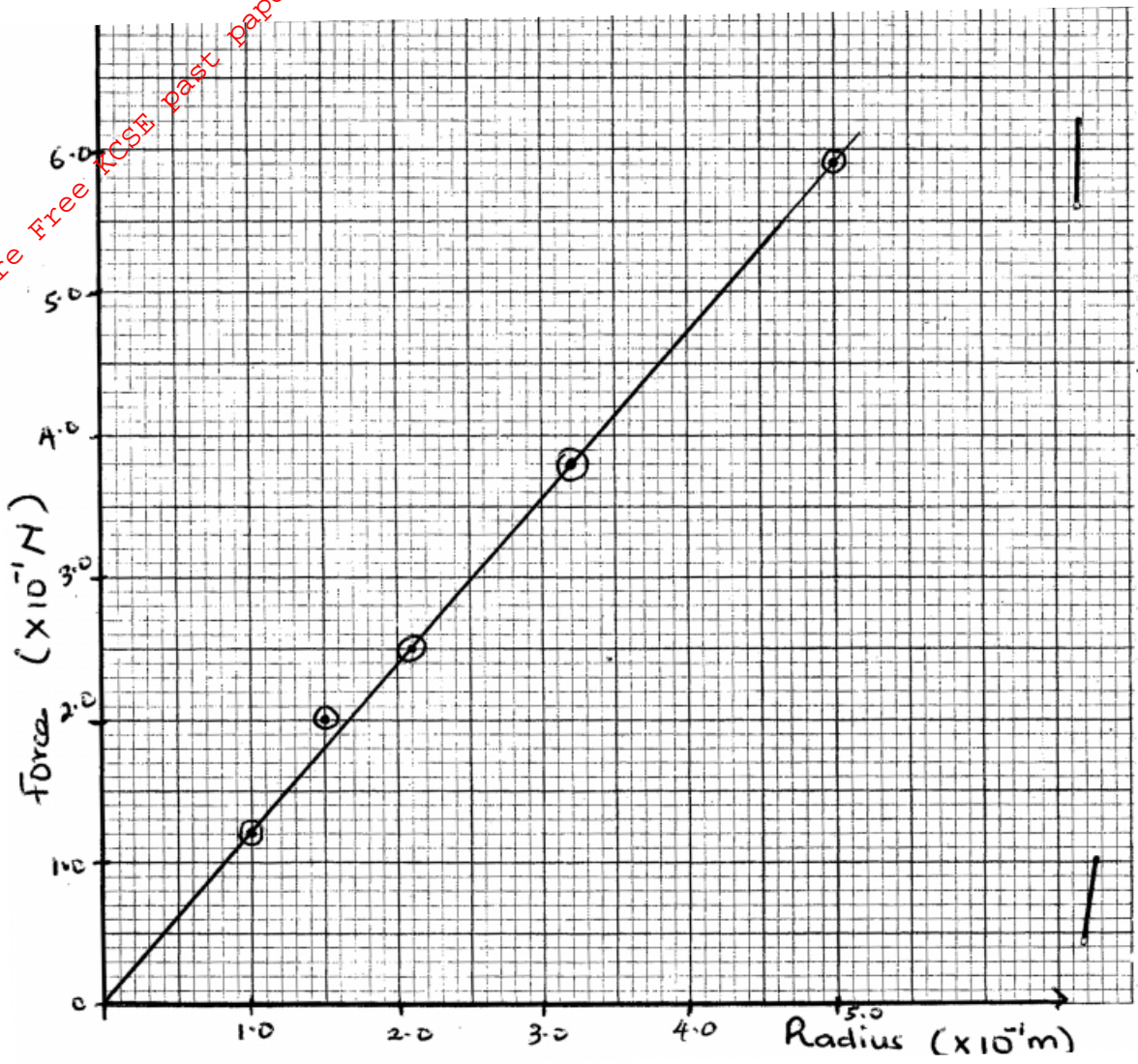
b) A turn table of radius 25cm is rotating at a speed of 0.875m/s. Calculate the angular velocity of a point on its circumference. (2 marks)

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c) The figure below shows a graph that was plotted by a student investigating the variation of centripetal force with radius, r of the circular path in which a body rotates.
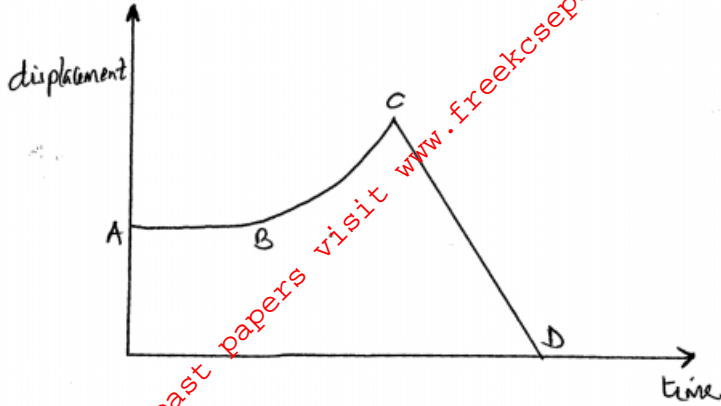

Given the mass of the body is a 100g, use the graph to determine the angular velocity, w of the body. (4 marks)

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d) The graph below shows a displacement time graph of the motion of a body.

State the nature of the motion between;

i) A and B   (1 mark)

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ii) B and C   (1 mark)

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iii) C and D   (1 mark)

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