NAME: …… **INDEXNO:**…….....……..

CANDIDATE'S SIGNATURE …… **DATE:**..…….

232/1
PHYSICS
PAPER 1 (THEORY)
TIME: 2 HOURS
JULY/AUGUST, 2016

KIGUMO SUB-COUNTY CLUSTER EXAM 2016

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

232/1
PHYSICS
PAPER 1
(THEORY)
TIME: 2 HOURS

INSTRUCTIONS

1. Write your Name, Index Number, School, Date and Sign in the spaces provided above.
2. This paper consists of two sections, Section **A** and **B**.
3. Answer **ALL** the questions in section **A** and **B** in the spaces provided.
4. **ALL** answers andworking **MUST** be clearly shown.
5. Non programmable, silent electronic calculators and KNEC Mathematical tables **may be** used.

FOR EXAMINER'S USE ONLY:

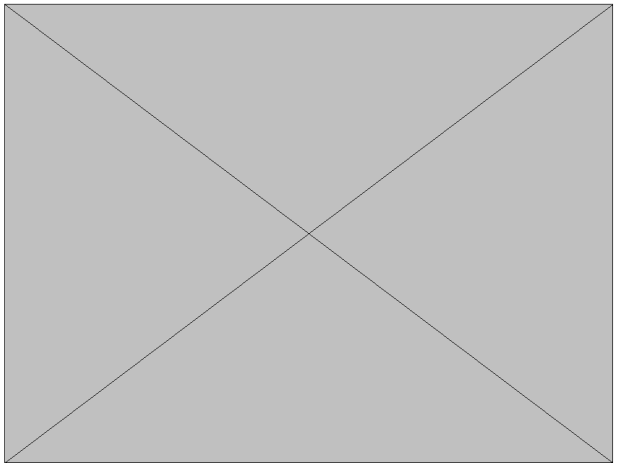
SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1-13	25	
B	14	09	
	15	11	
	16	11	
	17	11	
	18	13	
TOTAL		80	

SECTION A (25 MARKS)

1. In the space below give a sketch of a closed micrometer screw gauge showing an error of +0.02. (1mk)

2. The figure 1 below shows a measuring cylinder which contains water initially at level A. When a solid of weight 0.3N was immersed in the water, level rose to B.

Fig. 1



Use this information to answer the question that follow.
Determine the density of the solid mass giving your answer in g/cm^3. (3mks)

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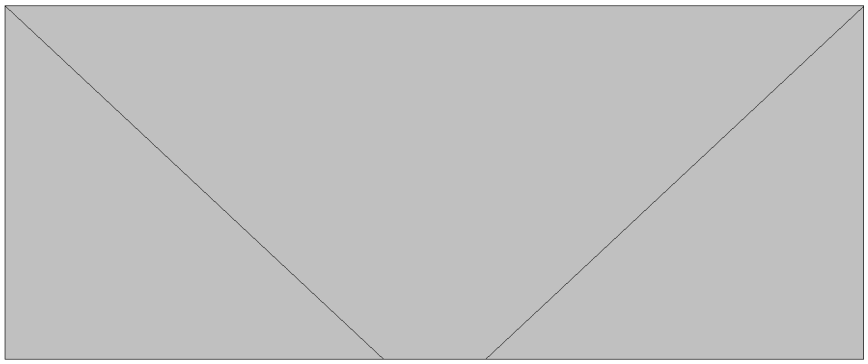
3. The figure 2 below shows a match stick floating on the surface of water in a basin,

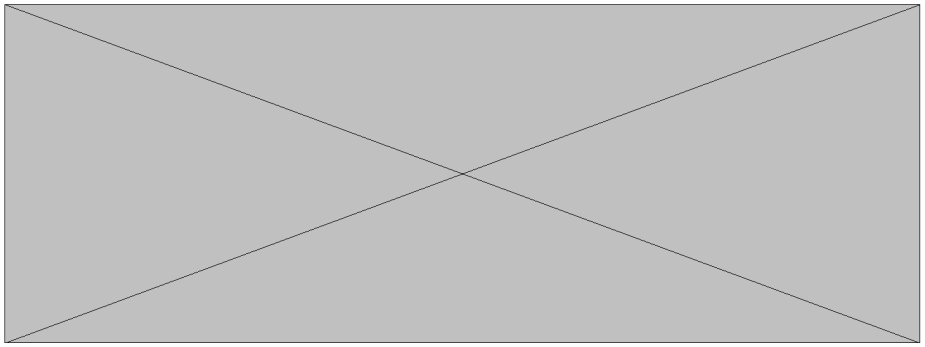
Fig. 2



When a drop of soap solution was carefully added to the water at A, the match stick is observed to move in a certain direction. State the direction of this match using A and B and explain this observation. (2mks)

4. The figure 3 below shows a cube of a certain wood whose density is the same as the density of water held on the surface of water in a beaker. Complete the figure (b) to show the final position of the cube when it is released. (1mk)

Fig. 3



(a) (b)

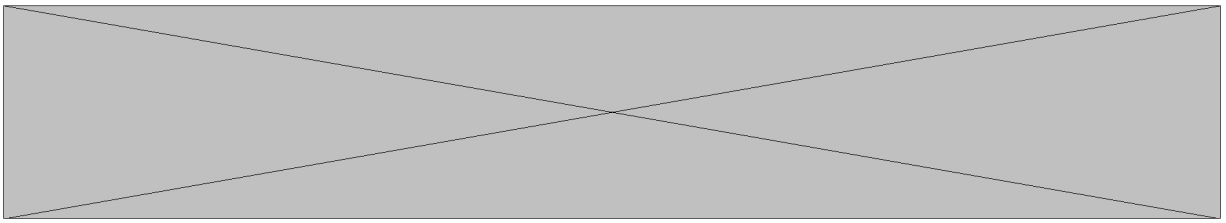
5. A block of metal of mass 5 kg is heated to 1100 and then gently immersed in 2kg of water in a container of negligible heat capacity. The final temperature of water is found to be 50^0C. What was the initial temperature of the water?
Specific heat capacity of metal = $840jKg^{-1}K^{-1}$
Specific heat capacity of water = $4200jKg^{-1}K^{-1}$ (3mks)

6. A spring of spring constant 60n/m is extended through 50cm. Calculate the amount of work down in stretching. (2mks)

7. Explain why it is sometimes easier to remove a metallic lid from a tightly closed glass jar after warming it under hot running water. (2mks)

8. Heat transfer by radiation is faster than heat transfer by conduction. Explain. (2mks)

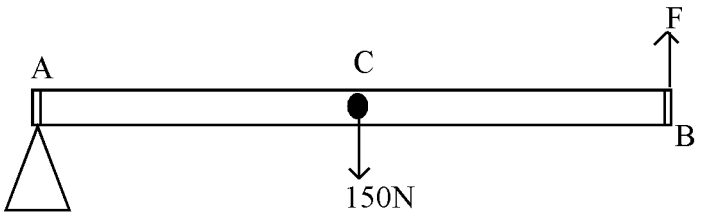
9. The figure 4 below shows a spring full of water. It has two identical holes A and B - drilled along its cylinder. The cylinder's nozzle is closed.



State with a reason how the speed of the jets of water from A and B compared when the piston is pushed into the cylinder. (2mks)

10. If you are a weatherman stationed in the arctic region (at the earth poles) state with a reason the thermometric liquid most suitable for your thermometer. (2mks)

11. In the figure 5 below distance AC = kB,calculate the force F that will keep the system in equilibrium. (2mks)



12. The figure 6 below shows parts A, B and C of a glass tube.

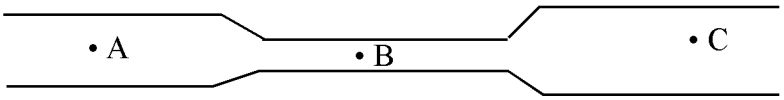


Fig. 6

State with a reason the part of the tube in which the pressure will be lowest when air is blown through the tube from A towards C. (1mk)

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13. The figure 7 below shows a velocity-time graph of a moving body.

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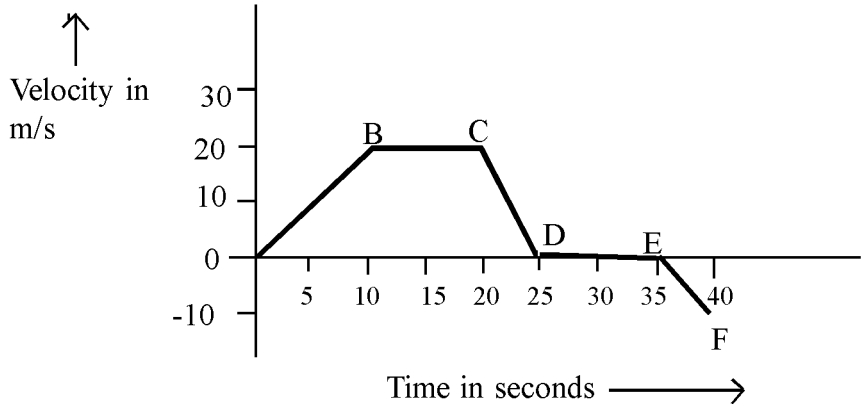

Describe the motion of the body over

i) region DE (1mk)

_____

_____

ii) region EF (1mk)

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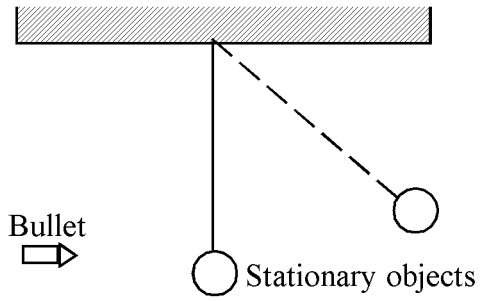
SECTION B (55 MARKS)

14. a) A bullet of mass 20g moving with a velocity of 100m/s embed on a stationery object of mass 900g suspended so that it can swing freely as shown in the figure below.



Determine

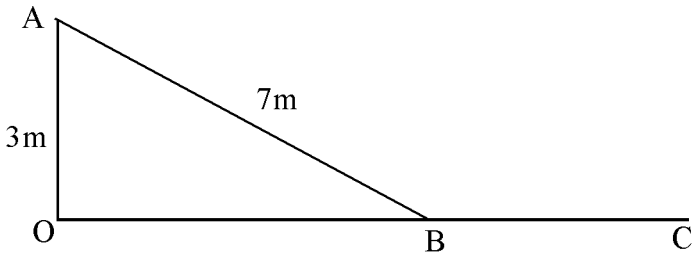
i) the velocity of the bullet and block immediately after collision. (3mks)

ii) the height through which the block rises. (3mks)

b) A train travelling at 100km/h increases its velocity to 132km/h in 8 minutes. Calculate its acceleration in m/s. (3mks)

15. a) The figures below shows a student of mass 60kg sliding freely down the slope AB. She continues and stops at point C.

fig. 8



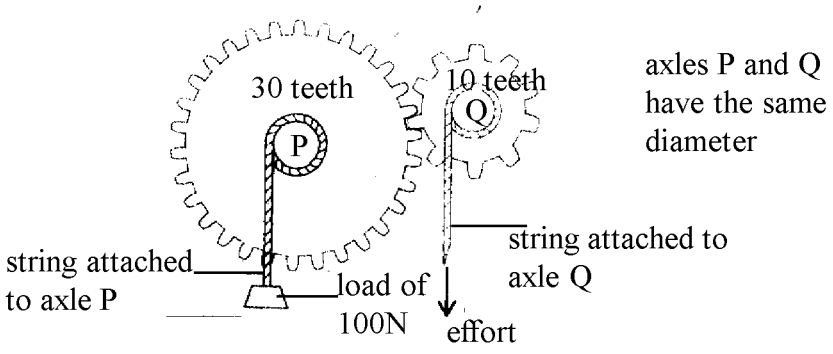
The frictional force is one-third of the students weight and acts uniformly all along the slide A to C. Take g = 10m/s^2.

i) How much potential energy is lost by the student in sliding from A to B. (2mks)

ii) Calculate the horizontal distance BC. (3mks)

iii) Ignoring friction along AB and air resistance find the maximum velocity with which the student slides at any one point along the path. (2mks)

b) The figure 9 shows a set of gears used to lift a load attached to the axle P by applying an effort to the axle.

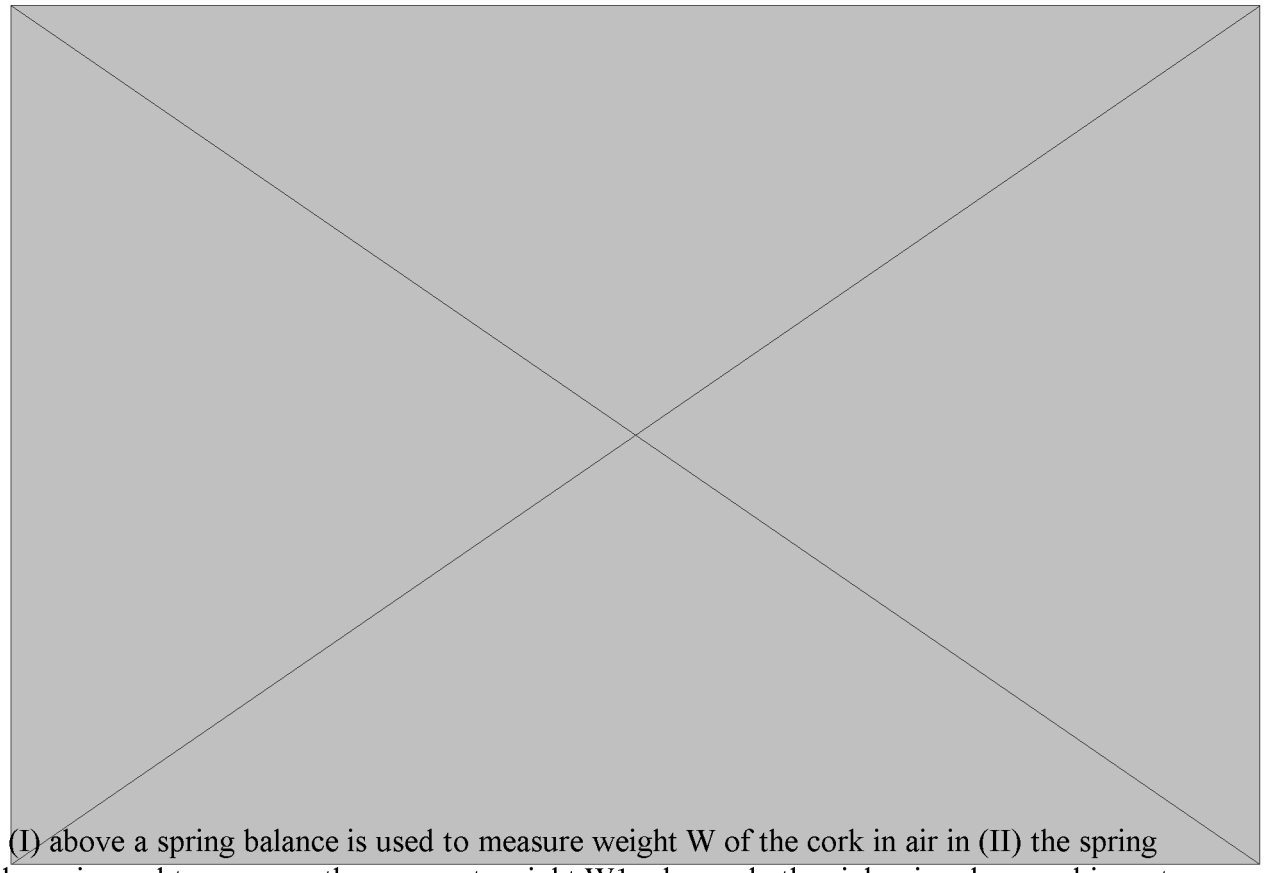


i) In order to lift the load through a distance of 2m, the axle P must rotate 5 times. How many times must axle Q be rotated. (2mks)

ii) Through what distance must the effort be applied of the axles P and Q have the same diameter. (2mks)

16. a) State the difference between the Archimedes principle and the law of floatation. (2mks)

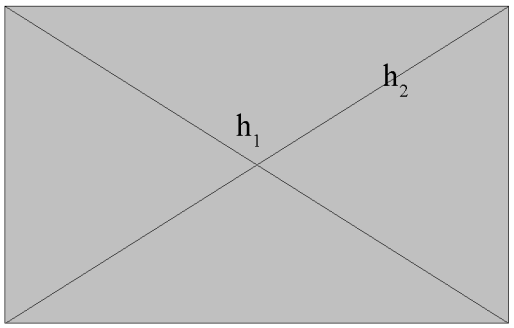
b) The figure below shows three stages of an experiment to determine relative density of a cork, which normally floats on water.



In (I) above a spring balance is used to measure weight W of the cork in air in (II) the spring balance is used to measure the apparent weight W1 when only the sinker is submerged in water. In (III) the spring balance is used to measure the apparent weight W2 when both the cork and the sinker are submerged.
The following observations were made
W = 0.0N
W1 = 0.6N
W2 = 0.28N
Use this information to determine the:
(i) upthrust on cork. (2mks)

(ii) relative density of cork. (3mks)

c) The figure below shows two glass tubes of different diameters dipped in water.



Explain why h_2 is greater than h_1. (3mks)

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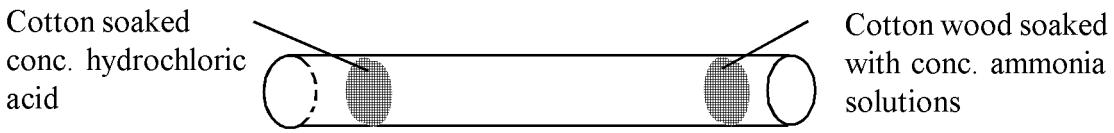
d) Some cotton wool soaked in conc. ammonia solution and hydrochloric acid were placed at the ends of a glass tube as show below.



After sometime a white deposit of ammonium chloride forms on the walls of the glass tube. Use a mark to show where the white deposit is formed. (1mk)

17. a) Distinguish between streamline and turbulent flow. (2mks)

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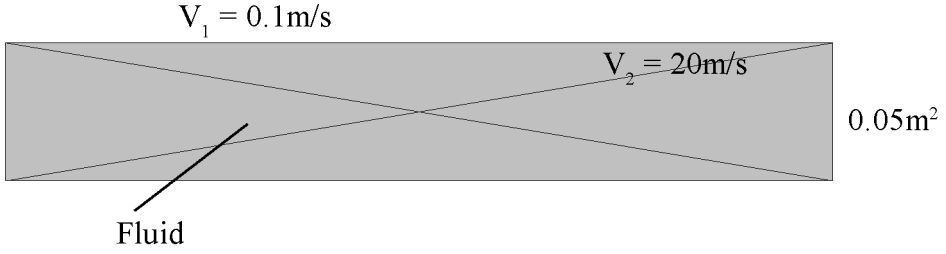
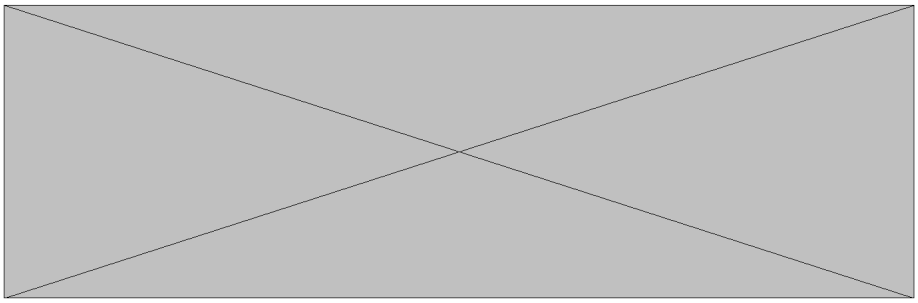
b) The figure below shows two light sheets of paper arranged as shown.

Explain the observation made when air is blown at the same speed and time at point A and B. (2mks)

c) The figure below shows an incompressible fluid moving through a tube of varied cross section area. If the area of the small tube is $0.05m^2$, Calculate the diameter of the large tube in cm. (3mks)



d) Use the figure below to answer the questions that follow.



i) What is the pressure resting on point A? (1mk)

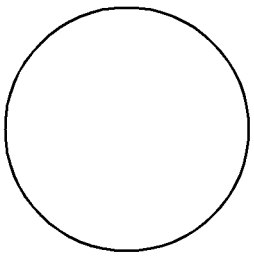
ii) What is the value of pressure difference in the instrument reading? (1mk)

iii) If the atmosphere pressure is 760mm of mercury, what is the value of gas pressure? (2mks)

18. a) State the factors affecting centripetal force. (3mks)

b) A mass of 0.4 kg is rotated by a string at a constant speed V in a vertical circle of radius 1 m. The minimum tension in the string is 6N.

i) Indicate on the diagram below the position of the object for the minimum tension, (1mk)



ii) Write an expression for this uniform force experienced. (1mk)

iii) Use your expression to determine the velocity V. (3mks)

iv) Determine maximum tension on the string. (2mks)

c) Using the kinetic theory of gases explain how a rise in temperature of a gas causes arise in the volume of the gas if the pressure is kept constant. (3mks)