

Name: Index No.

School: Date: Candidate's Sign

232/1

PHYSICS

PAPER 1 (THEORY)

FORM 4

MARCH / APRIL 2013

TIME: 2 HOURS

ELDORET EAST INTER - SCHOOLS EXAMINATION - 2013

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

INSTRUCTIONS TO CANDIDATES

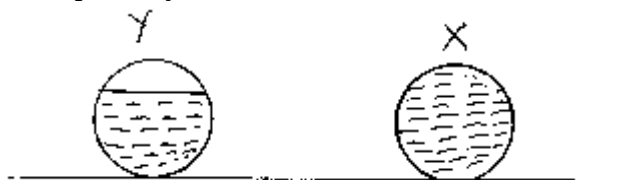
- This paper consists of Two section: I and II.
- Answer ALL questions in section I and II in the spaces provided.
- All working MUST be clearly shown.
- Mathematical tables and silent non programmable Electronic calculators may be used.

FOR EXAMINER'S USE ONLY

Section	Question	Maximum Score	Candidate's Score
I	1 - 13	25	
II	14	15	
	15	14	
	16	11	
	17	7	
	18	8	
	Total Score	80	

SECTION I: (25MARKS)

1. A burette has an initial reading of 22.5cm^3 . Determine the final reading after a liquid of volume of 11.3cm^3 is removed from the burette. (2marks)
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2. Explain why a half-full juice bottle is more stable than a full one or an empty one. (1mark)
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3. The spring constant of a spring balance is 125N/m . It stretches through a length of 20cm . Calculate the maximum weight that can be measured using this spring. (2marks)
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4. A machine lifts a load of 20kg vertically upwards at a rate of 3m/s . If the machine is 70% efficient, determine the total power input developed by the machine. (3marks)
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5. State one difference between boiling and evaporation. (1mark)
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6. A body weighing 25N displaces 1.4kg of water when totally immersed in it. Find the reading of a spring balance supporting it in water? (2marks)
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7. The diagram below represents two identical hollow spheres. Sphere X is completely filled with water while Y is partially filled as shown;



When the two spheres are rolled gently along a horizontal surface, it is observed that sphere Y stops early before sphere X. Explain this observation. (2marks)

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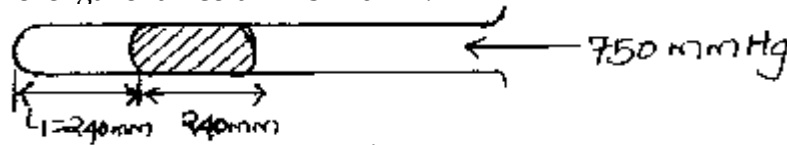
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8. Explain why water in a pond may freeze on the surface only but not deep inside the pond. (1mark)

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9. Air is trapped inside a glass tube by a thread of mercury of 240mm long. When the tube is held horizontally the length of air column is 240mm.



Assuming that the atmosphere pressure is 750mmHg and the temperature is constant; calculate the length of air column when the tube is held vertical with open end up. (2marks)

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10. a) Two ships moving parallel close to each other are likely to collide. Explain (1mark)

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- b) Water flows through a tube of length 50cm and of cross-sectional area 50cm^2 in 2.5 seconds. Calculate the rate of flow in cubic metres per second (2marks)

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11. When methylated spirit is spilled on the hand, the hand feels very cold. Explain this observation. (1mark)

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12. Explain why glass container with thick walls is more likely to crack than the one with a thin wall when a very hot liquid is poured into them. (2marks)

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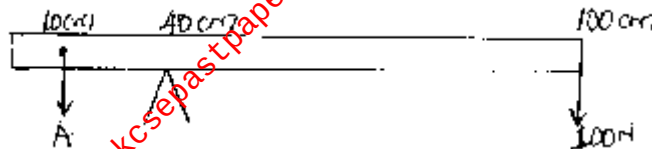
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13. a) State principle of moments (1mark)

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- b) A uniform wooden bar of length 1m and weight 800g is pivoted at 40cm as in the figure below;



Calculate the value of force A if the system is to be in equilibrium.

(2marks)

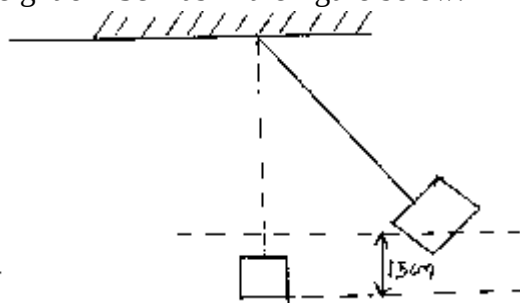
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SECTION II: 55 MARKS

14. a) When a bullet of mass 0.02kg was fired into a block of ballistic pendulum of mass 1.98kg, the block rose through a height of 15cm as in the figure below:



Determine:

- i) The potential energy gained by the block.

(2marks)

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- ii) Initial velocity of the bullet.

(3marks)

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- b) A trolley of mass 1kg moving at 1m/s collides head on with a stationary blocks of wood of mass 2kg. If the trolley and the block of wood are struck together and moved a distance of 0.1m before coming to rest, find the;

- i) The velocity after collision.

(2marks)

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- ii) Kinetic energy after collision.

(2marks)

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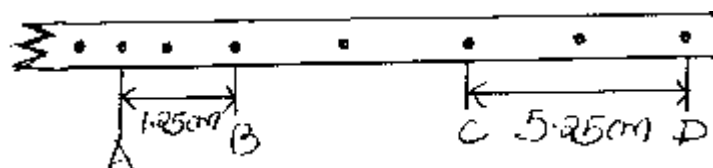
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iii) The frictional force.

(2marks)

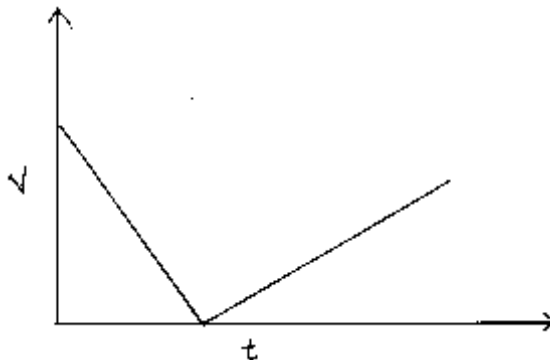
c) A tape attached to a moving trolley is run through a ticker timer. A section of it appeared as shown below:



If the frequency of ticker timer is 50, calculate the acceleration of trolley.

(3marks)

d) In figure below shows a velocity time graph for an object in water. Sketch a velocity-time graph for the same motion.



i) Describe the motion of the body

(1mark)

15. a) Explain why bodies in circular motion undergo acceleration even when their speed is constant.

(2marks)

b) A particle moving along a circular path of radius 5m describes on arc length 2m every 2 seconds. Determine;

i) Its angular velocity

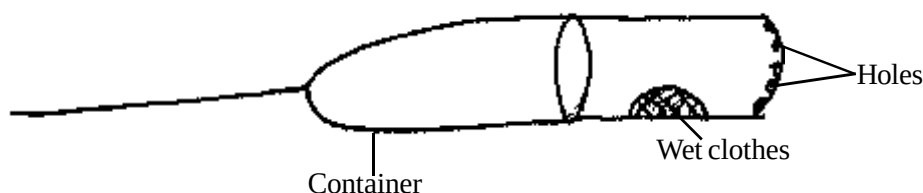
(2marks)

ii) Its periodic time

(2marks)

- c) A stone of mass 40g tied to the end of a string 50cm and whirled in a vertical circle at 2 revolutions per second. Calculate its maximum tension in the string. (3marks)

- d) The figure below shows a container with small holes at the bottom in which wet clothes have been put.

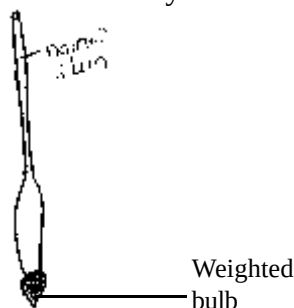


When the container is whirled at high speeds, it's observed that the clothes dry faster. Explain how the rotation of the container causes the clothes to dry faster. (3marks)

- e) State two factors affecting centripetal force. (2marks)

16. a) A solid weighs 40N in air, 15N when totally immersed in water and 20N when fully immersed in liquid X. Determine the relative density of liquid X. (2marks)

- b) The figure below shows a bulb hydrometer



i) State the principle used in the hydrometer.

(1mark)

Explain why

i) The stem is narrow

(1mark)

ii) The bulb is wide

(1mark)

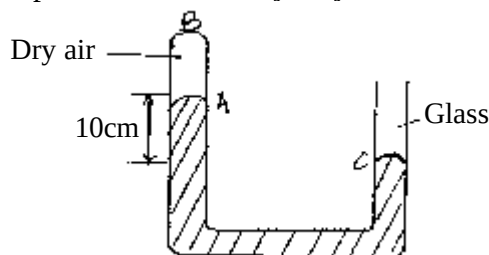
iii) The lead shots are placed at the bottom

(1mark)

c) A simple hydrometer is set up with the test tube partially filled with lead shots. Its mass is 10g and its cross-sectional area is 0.5cm^2 . Determine the length of the tube immersed in brine of density 1.20g/cm^3 . (3marks)

d) State two examples where a hydrometer is commonly used in practical life. (2marks)

17. a) The figure below represents a transparent glass sealed on one end and containing mercury. The set up was used to verify Boyle's law



i) Explain why the gas should be dry.

(1mark)

ii) Describe how the set up can be used to verify Boyle's law of gases. (3marks)

iii) Sketch a graph to represent the results that would be obtained. (1mark)

iv) Use Kinetic theory of gases to explain

I) Boys law

(1mark)

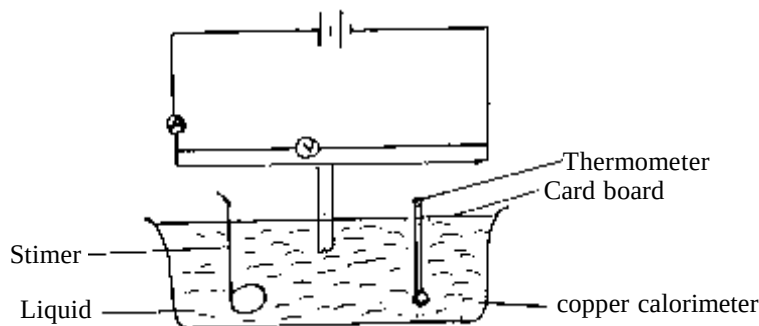
II) Why pressure of a gas increases with temperature.

(1mark)

18. a) Distinguish between heat capacity and specific heat capacity.

(2marks)

b) The figure below shows a set up that may be used to determine specific heat capacity.



i) Outline the measurements that should be taken in the experiment.

(2marks)

ii) Explain how the measurements taken in (i) may be used to determine the specific heat capacity.

(2marks)

iii) State one precaution one would take in modifying the set up for accurate results.

(1mark)

c) An electric heater rated 2KW is used to heat a 400g aluminium container filled with 1kg of water. Assuming no heat is lost to surroundings; calculate the time taken to raise the temperature of the water by 10°C.

Take specific heat capacity of aluminium is 900J/kg/k, and that of water is 4200J/kg/k. (2marks)