Name…… …….…… Index No:…….

233/1
PHYSICS 1
PAPER 1
THEORY
JULY/AUGUST 2014
TIME: 2 HOURS

Candidate's Signature ……..……
Date: ……

NYAMIRA SUB-COUNTY JOINT EVALUATION EXAM

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

232/1
Physics
Paper 1
2 hours

INSTRUCTIONS TO THE CANDIDATES:

- *Write your **name and index number** in the spaces provided above.*
- *Answer **all** the questions both in section **A** and **B** in the spaces provided below each question*
- *All workings **must** be clearly shown; marks may be awarded for correct steps even if the answers are wrong.*
- *Mathematical tables and non programmable silent electronic calculators may be used.*

(*Take acceleration due to gravity g= 10ms^{-2} Density of water 1g/m^{-3}*)

For examiners use only

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
Section A	1-13	25	
Section B	14	10	
	15	06	
	16	12	
	17	09	
	18	09	
	19	**11**	
	TOTAL	**80**	

This paper consists of 8 printed pages. Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing.

SECTION A (25 MKS)

1. Figure 1 below shows a section of a burette containing some water

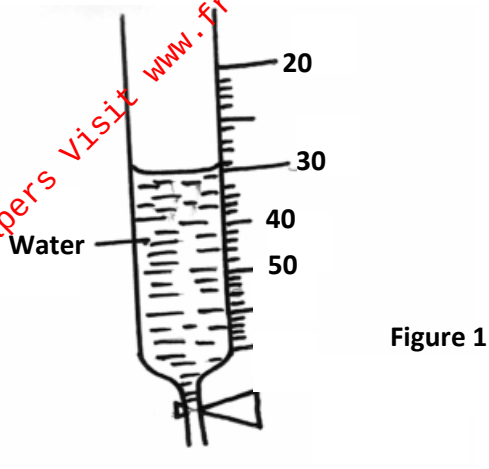

Figure 1

Determine the reading on burrette if four (4) drops of water each of volume $0.5cm^3$ are added(2mks)

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2. A uniform wooden plank weighing 50N and 5m long is suspended by two ropes A and B, 1.5m apart. A is 2m from one end and B is 1.5m from the other end as shown in figure 2 below. A concrete block of weight 100N is suspended from the centre of the plank

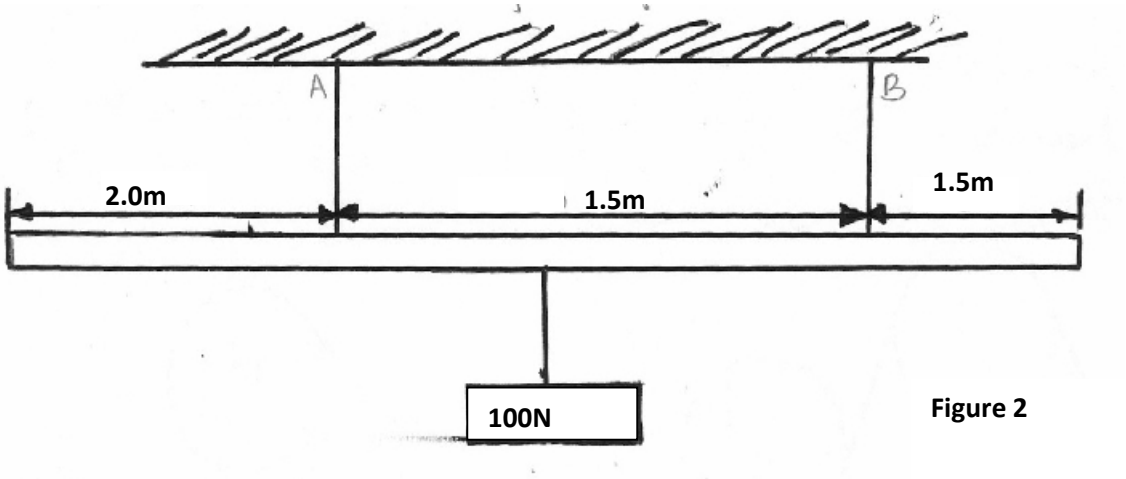

Figure 2

Calculate the tension T_A in string A (3mks)

3. A steel sphere released in a tall transparent water jar attains a constant velocity after a while. The same sphere released in air falls at a constant acceleration. Explain with a reason the difference in its motion in water and in air (2mks)

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4. The stability of a body can be increased by increasing the base area and lowering its centre of gravity. State one way of lowering its centre of gravity. (1mk)

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5. To what temperature must 2,000cm^3 of a gas at 27^{o}C be heated at constant pressure in order for its volume to increase to 25000cm^3? (3mks)

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6. A body of mass 25kg moving with uniform accelaration has an initial momentum of 60kgm/s and after 10s the momentum is 90kgm/s. calculate the acceleration of the body (3mks)

7. A load was raised using the system shown below. The system was then modified as in (b) and used to raise the same load

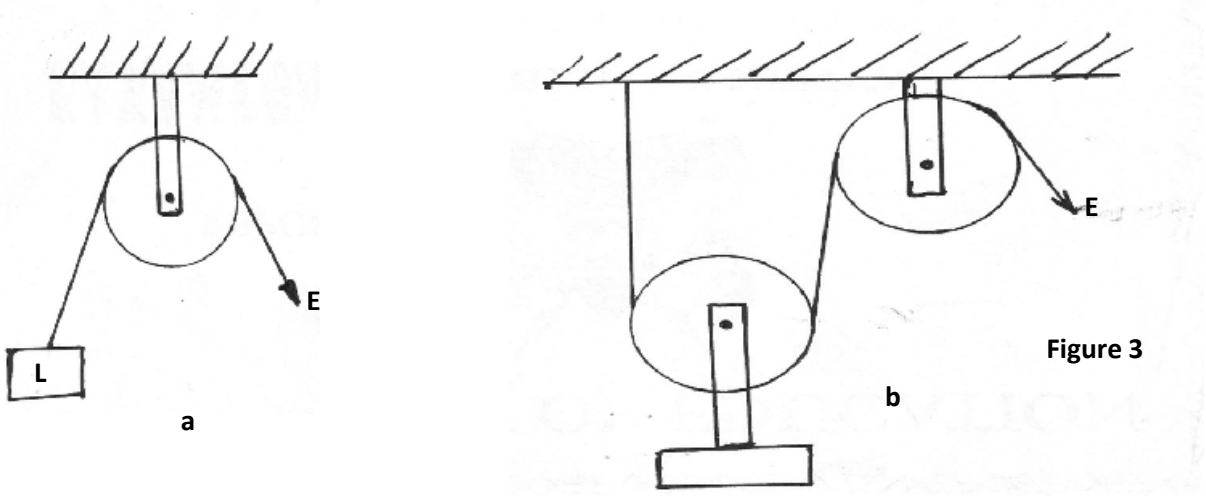

Figure 3

State and explain the change in efficiency (2mks)

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8. State two physical properties of a material medium which may be used to measure temperature (2mks)

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9. On increasing the temperature of a fixed mass of a gas its pressure was noted to increase. Explain (2mks)

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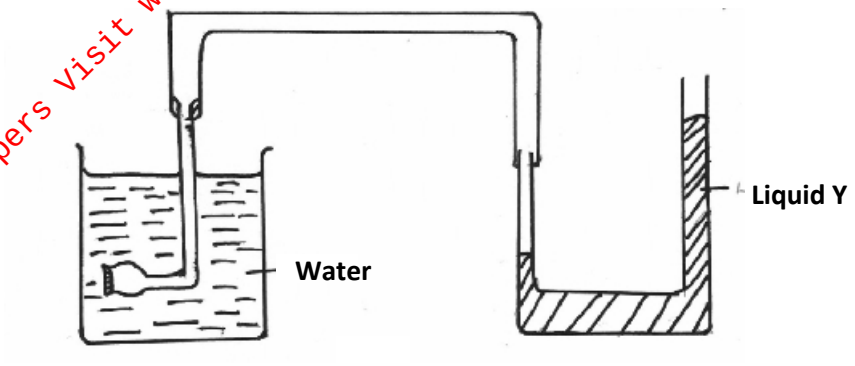
10. The figure 4 below shows a set used in a physics demonstration



Briefly suggest **two** conclusions that may be drawn from the experiment (2mks)

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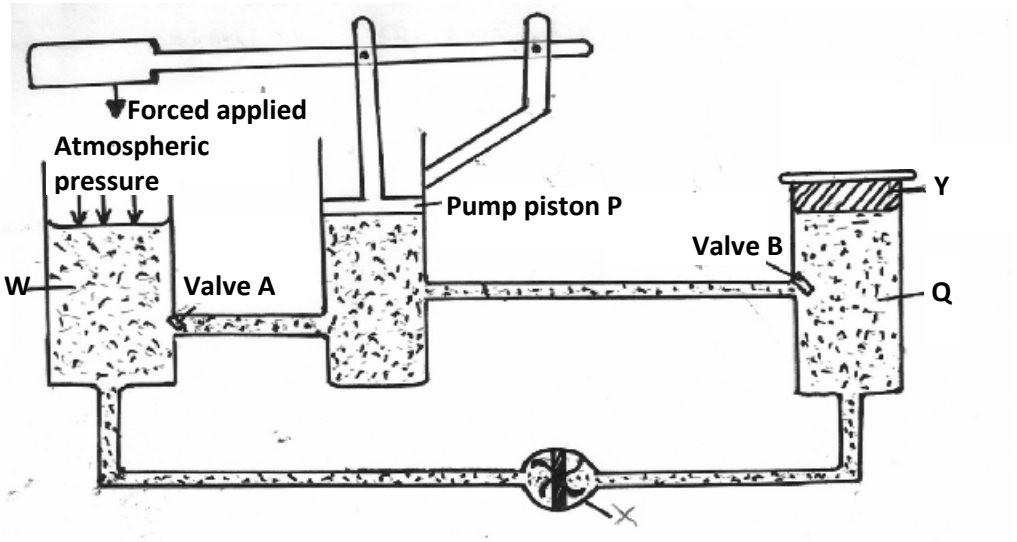
11. A 60 litre giant density bottle weighs 100N when empty. What will be its mass when filled with liquid W whose density is 0.72g/cm3? *(g=10N/kg)* (3mks)

12. Figure 5 below is a hydraulic jack system



(a)Name the parts labeled W,X and Y (3mks)

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(b) Briefly explain how the device may be used to raise a load at the position shown (3mks)

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(c) Part W is left open to the atmosphere as indicated. Explain (2mks)

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(d) State two ways by which the mechanical advantage of the device may be increased (2mks)

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(e) One such hydraulic brake system was used to lift a car whose mass was 1200kg. The cross sectional area of Q was 5000cm^2 and that of P was 5cm^2. Determine the force exerted on the pump piston (3mks)

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13. (a) Define specific latent heat of fusion (1mk)

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(b) State two factors which affect freezing point of ice (1mk)

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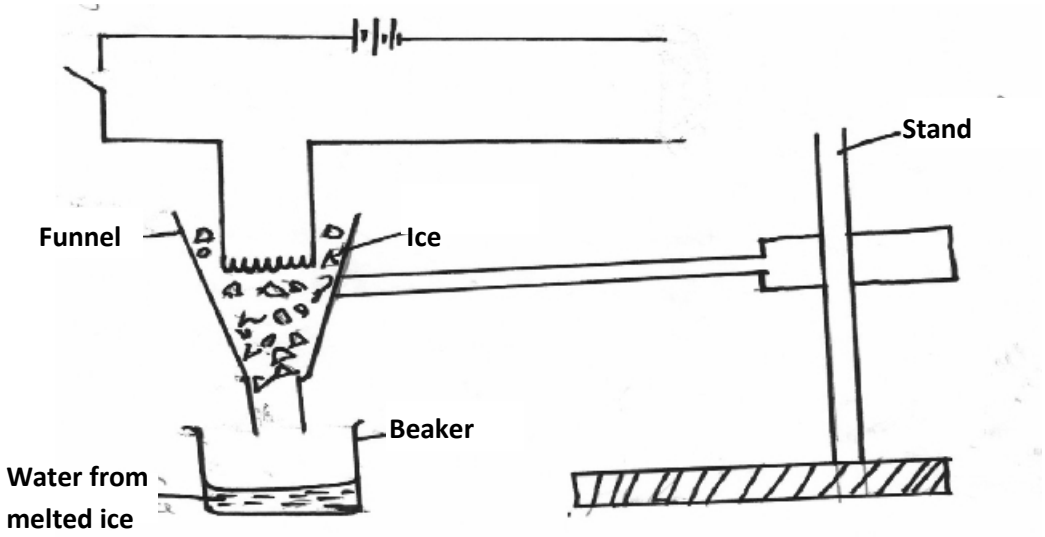
(c) Figure 6 below illustrates an experiment in which electrical energy is used to determine specific latent heat of fusion



(i) Other that time, state other measure measurements that would be used to determine the quantity if heat Q absorbed by ice in unit time (2mks)

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(ii) Complete the circuit to show connection of the essential circuit components (3mks)

(iii) Explain how to proceed and determine the value of L_{f1}, the specific latent heat of fusion of Ice (3mks)

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(d) In a similar experiment, the following results were obtained when heat was switched on for 5 minutes

Voltmeter reading =6.0V

Ammeter reading =1.25A

(i) Calculate the power rating of the heater (3mks)

(ii) If by the end of the experiment, 200g of water at 0oC was collected, determine the latent heat of fusion of ice (2mks)

14. (a) State Archimedes principle. (1mk)

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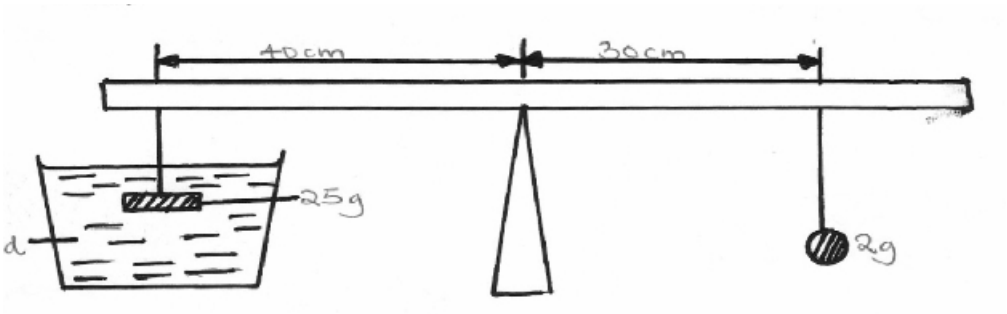
(b)Figure 7 below shows a block of mass 25g and density 200kgm-3 submerged in a certain liquid while suspended from a horizontal beam by means of a thread. A mass of 2g is suspended from the beam as shown



(i) Determine the upthrust force acting on the block (3mks)

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(ii) Calculate the density of the liquid (3mks)

(c) Figure 8 shows a piece of cork held with a light thread attached to the bottom of a beaker. The beaker is filled with water

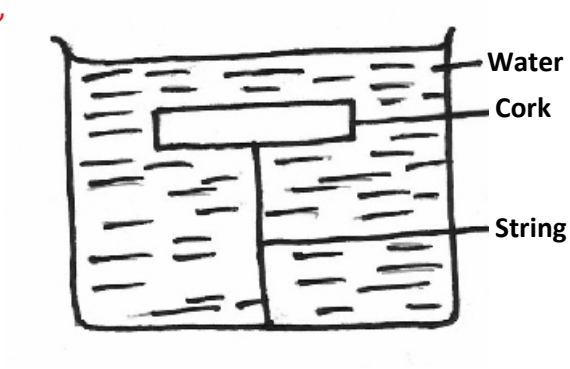

Fig 8

(i)Indicate and label on the diagram the forces acting on the cork (3mks)

(ii) Write an expression showing the relationship between the forces (1mk)

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(d) A solid displaces 8.5cm3 of a liquid when floating and 11.5cm3 when fully submerged in the liquid. The density of the solid is 0.8g/cm3. Determine the upthrust on the solid when floating(3mks)

15. (a) Define angular velocity (1mk)

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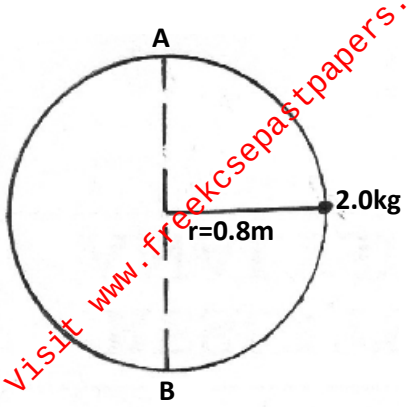
(b) The diagram below fig.9 shows an object of mass 2.0kg being whirled in a vertical circle of radius 0.8, at a uniform speed of 50m/s



Determine

(i) The centripetal force on the object (3mks)

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(ii) The tension in the string when the object is at **A** (3mks)

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(iii) The tension in the string when the object is at **B** (3mks)

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(c) The speed of rotation is gradually increased until the string snaps. At what point is the string likely to snap? Explain (3mks)

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