NAME OF THE SCHOOL ……

CANDIDATES' NAME …… INDEX NO……..

CANDIDATES' SIGNATURE…….. DATE……..

NAKURU DISTRICT SEC. SCHOOLS TRIAL EXAMINATIONS @ 2014

Kenya Certificate of Secondary Education

PHYSICS PAPER 232/1
YEAR 2014

INSTRUCTIONS TO THE CANDIDATES

*This paper consists of two sections **A** and **B**.*

*Answer all questions from **both** sections in the spaces provided.*

*All working **must** be clearly shown. Electronic calculator may be used.*

FOR EXAMINER'S USE ONLY

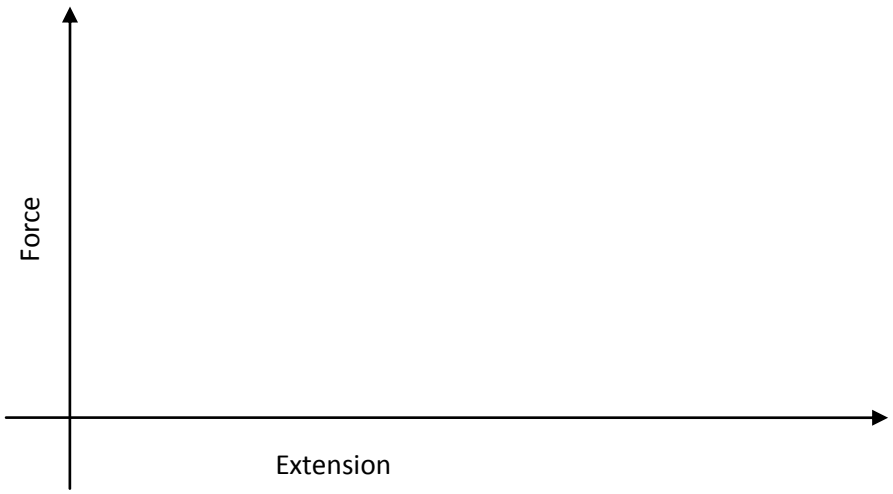
SECTION	QUESTION	MAX SCORE	CANDIDATE'S SCORE
A	1 – 11	25	
B	12	12	
	13	13	
	14	14	
	15	10	
	16	6	

	TOTAL	80	

SECTION A (25marks)

1) Two micrometers screw gauges were used to measure the diameter of a wire. The readings obtained were 2.06mm and 2.08mm respectively. State two possible causes of the difference in the readings. (2mk)

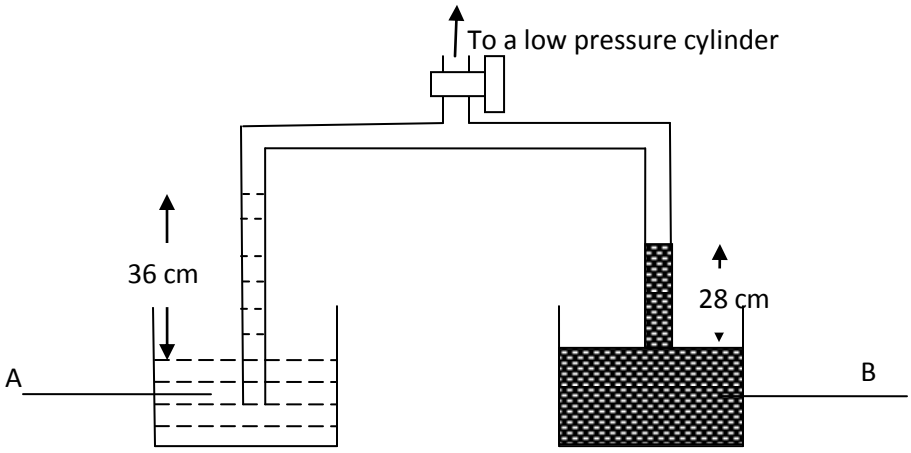
2) Two steel wires of diameter 0.30mm and 0.50mm are rolled into springs of equal number of turns and length. On the axes below, sketch their graphs of force against extension. (2mks)



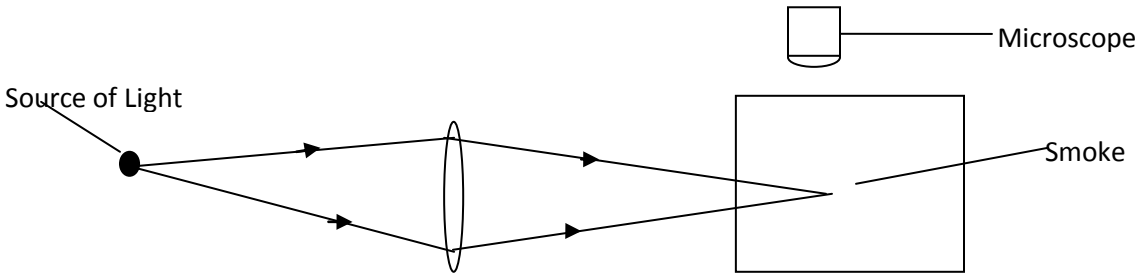
(ii) Give a reason for any difference between the graphs. (1mk)

3) 1,500cm^3 of wine is mixed with 1,000cm^3 of water. Given that the density of mixture is 880kg/m^3 and that of water is 1000kg/m^3, find the density of the wine. (3mks)

4) Figure 1 shows two liquids A and B connected to a low pressure cylinder. When the tap is opened, the liquids take their levels as shown. Given that the density of liquid A is 1.2g/cm^3. Determine the density of liquid B. (3mk)



5) Some smoke was enclosed in a smoke cell and observed under a microscope as shown in figure 2. State and explain the observed motion of the smoke particles.
(2mks)

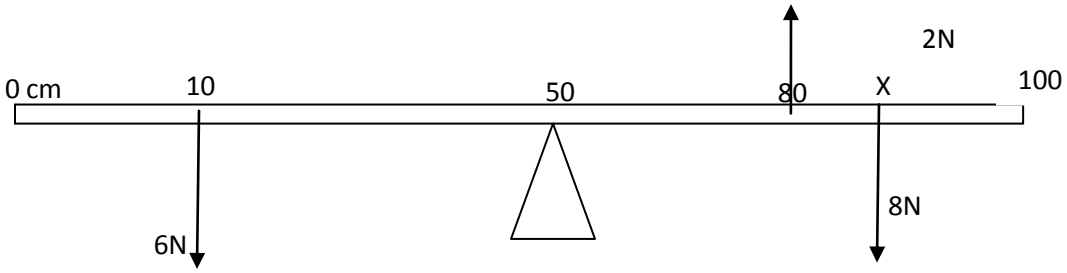


6) In vacuum flasks, double walled-glass with a vacuum between the walls is most commonly used in the basic design. State the role of the ,

i. Vacuum (1mk)

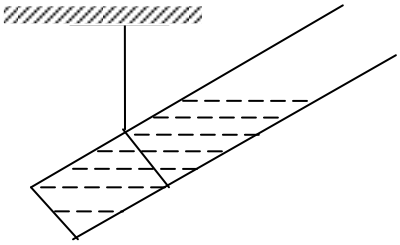
ii. The silver on the wall (1mk)

7) A uniform meter rule is balanced by a set of forces as shown in figure 3 below. A force of 8N is suspended at a point **X**



Determine the value of **X.** (3mk)

8) Figure 4 below shows test-tube containing water at 0^0 C and suspended using a string.

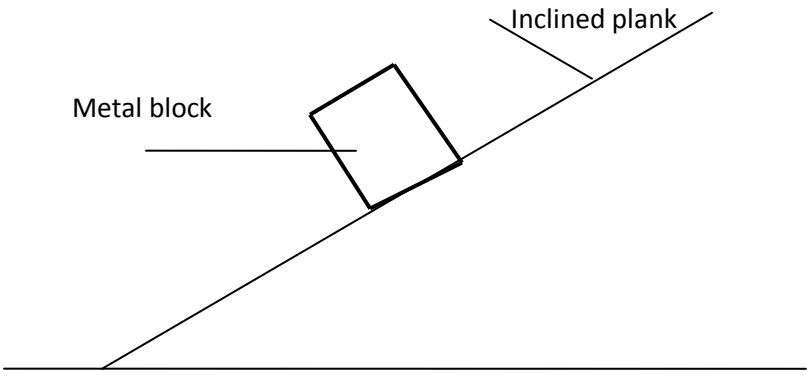


State what would be observed if the temperature drops to -10^0 C. (1mk)

9) A spring of length 10cm is stretched to 14cm when loaded with a mass of 400g. Determine its length when loaded with a mass of 700g. (3mk).

10) State Bernoulli's' principle (1mk)

11) Figure 5. Shows a block of metal resting on an inclined plank of wood. Indicate any two forces that are in action. (2mk)

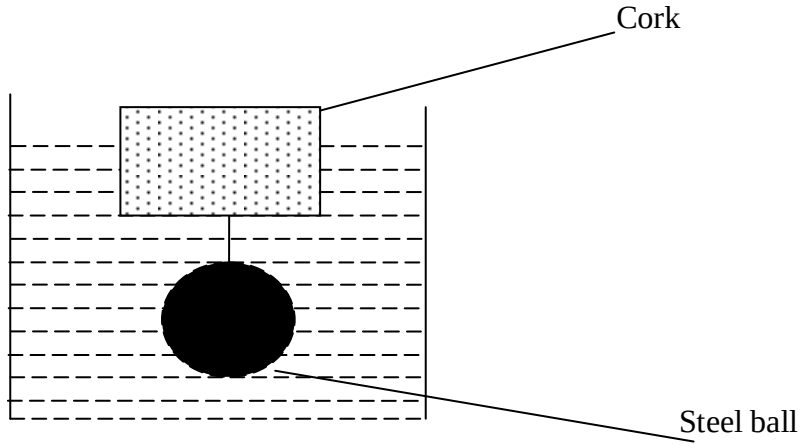


SECTION B (55mks)

12) (a) State the law of floatation. (1mk)

(b) A simple hydrometer is made using a test-tube that is partially filled with lead shots. The hydrometer is made to float in water and the level of the water marked on the side of test-tube. Describe how the test-tube can be calibrated to measure relative density. (2mk)

(c) A cork of mass 1000g is held floating in water by means of a spherical steel ball as shown



(i) Given that the mass of the sphere is 500g and volume 70cm^3. The base area of cork is 25cm^2. Determine the total upthrust. (2mk)

(ii) The string accidentally cuts. Find the new depth of the cork. (3mk)

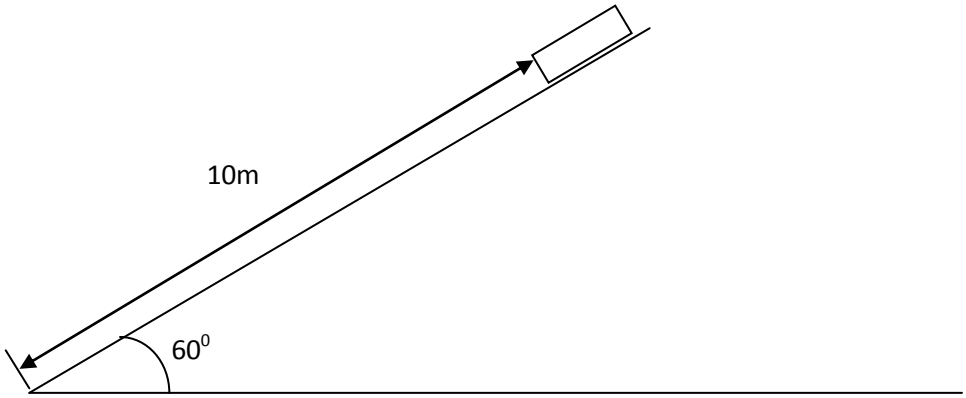
(iii) Determine the initial acceleration of the steel ball. (3mk)

(iv) State why after sometime, the acceleration would be lower than the value obtained (1mk)

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

(b) A bullet of mass 50g is fired from a gun at muzzle velocity of 400m/s. Given that the gun has a mass of 5kg, find the recoil velocity of the gun. (3mks)

(c) A box of mass 5kg is at rest on an incline plane at a distance of 10m from the base as show in figure 6 below.



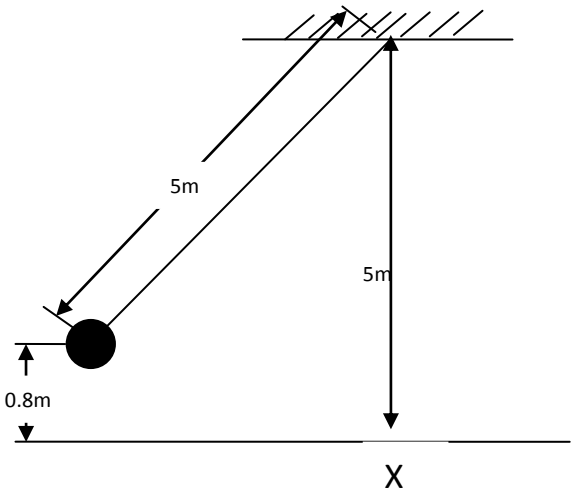
(i) Determine the friction force present on the incline as a result of the mass. (3mks)

(ii) An oil leakage from inside the box dripped on the inclined plane. After sometimes, it was noted that the box slide down the incline plane. Determine the acceleration of the box just before it landed at the base. (3mk)

(iii) Calculate the velocity of the block at time of landing at the base (3mk)

14) (a) Define the term centripetal acceleration. (1mk)

(b) A pendulum bob of mass 2kg is suspended by a string of length 5m as shown in figure 7 below.

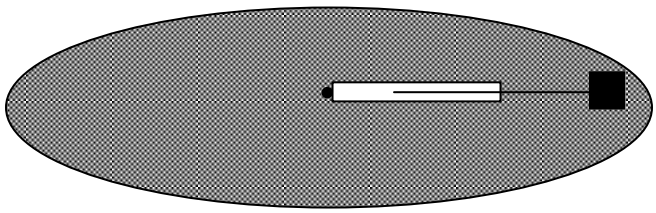


Determine;

(i) The speed of the bob when the ball passes point **X**. (2mks)

(ii) The force on the string when the bob passes at the point X. (3mk)

(c) Figure 8 shows a turn table of radius 4m with a mass fixed to its centre by means of a spring balance. The mass is made to rotate with a varying angular velocity. The tension on the string was measured for various values of angular velocity. The table shows the results obtained.



Angular Velocity $(rad/s)^2$	1.88	2.95	3.97	5.10	6.0
Tension T (N)	0.04	0.35	0.77	1.29	1.95
$\omega^2(rad^2/s^2)$	3.53	8.70	15.76	26.01	36.00

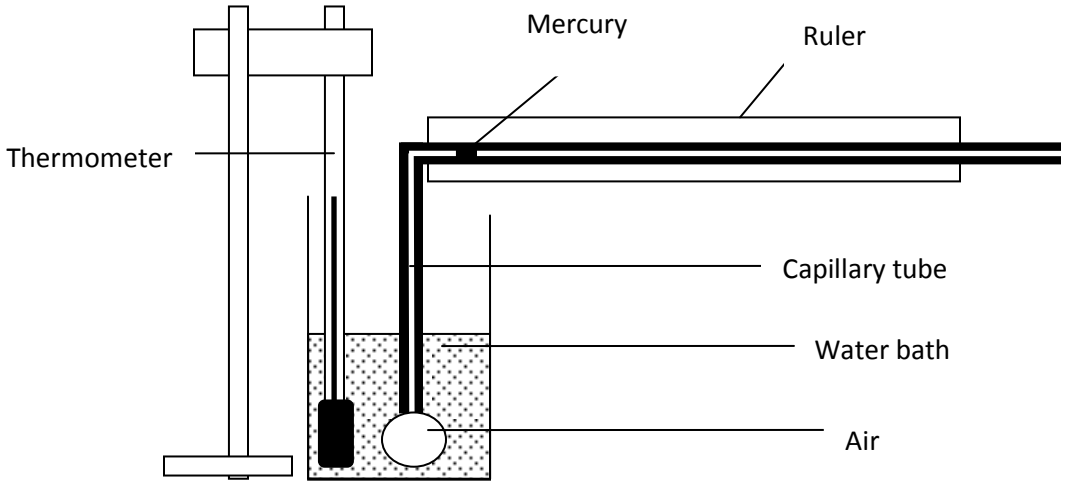
(i) Plot a graph of T against ω^2. (5mk)

(ii) From the graph, determine the mass of the bob given that $T=m\omega^2r - c$, where c is a constant (3mk)

15) (a) Explain the term 'absolute zero'. (1mk)

(b) Using the kinetic theory of gases, explain how reduction in volume of a fixed mass of gas leads increase in temperature (2mk)

(c) Figure10. Below shows a set-up used to verify a certain gas law.



(i) State one physical factor that shall remain constant (1mk)

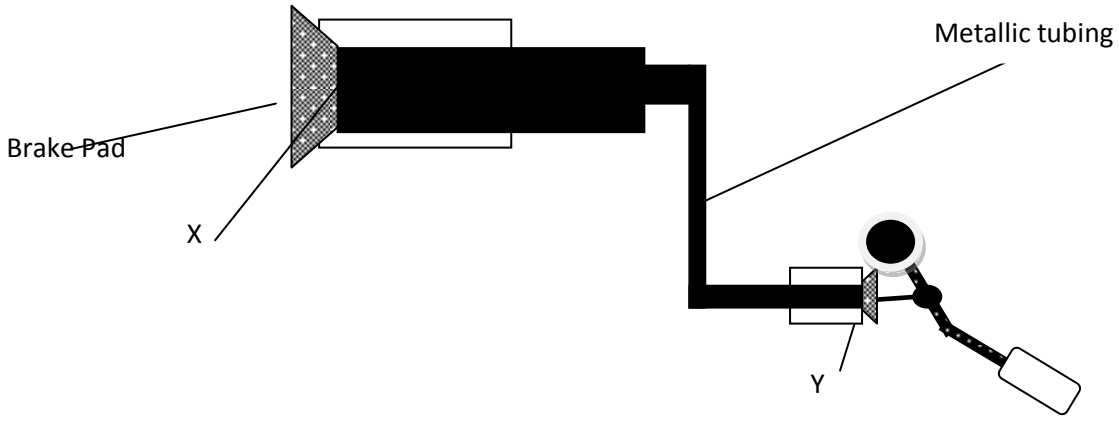
(ii) State what shall be varied for one to obtain results. (1mk)

(iii) Explain how the apparatus shall be used to verify the intended law. (4mk)

Identify one limitation of the set up in the experiment. (1mk)

16) (a) Define efficiency as applied to simple machines (1mk)

(b) Figure 11below represents the hydraulic brake of a machine. Piston X has a diameter of 20cm while Y has a diameter of 2cm.



(i) A force of 20N is required at Y to stop the machine. Determine the braking force (2mk)

(ii) State one reason why oil is preferred to water for use in the brake system(1mk)

iii) State the principle that the hydraulic brake above is based on (1mk)

iv) State with a reason what would be observed on the machine if piston X was replaced by one of a smaller cross-sectional area. (1mk)

ANSWERS:

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