Name_____ **Index No.** _____

Candidate's signature _____

Date _____

232/1
PHYSICS
PAPER 1
THEORY
JULY/AUGUST 2014
2 HOURS

MAKUENI DISTRICT JOINT FORM 4 EXAMINATION 2014
Kenya Certificate of Secondary Education
PHYSICS
PAPER 1
2 HOURS

INSTRUCTIONS TO CANDIDATES
(a) Write your name and index number in the spaces provided above.
(b) Sign and write the date of the examination in the space provided
(c) This paper consists of two sections; A and B
(d) Answer **ALL** questions in section A and B in the spaces provided
(e) **All working must** be clearly shown in the spaces provided in this booklet
(f) Non – programmable silent electronic calculators may be used
(g) Candidates should answer the questions in English

FOR EXAMINER'S USE ONLY

Section	Question number	Maximum score	Candidates score
A	1 – 13	25	
B	14	14	
	15	10	
	16	9	
	17	12	
	18	10	
	Total	80	

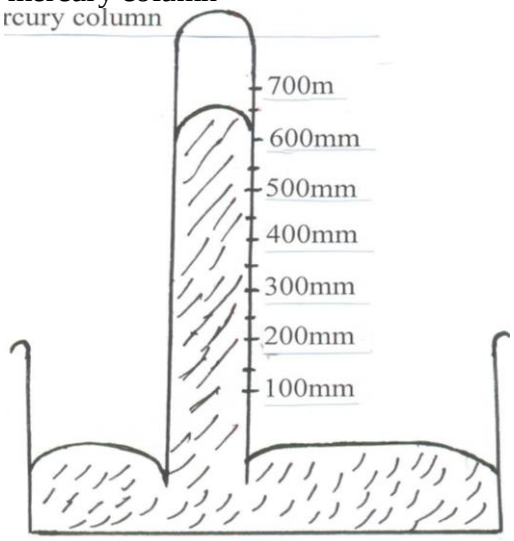
This paper consists of 11 printed pages

Turn Over

SECTION A (25 MARKS)

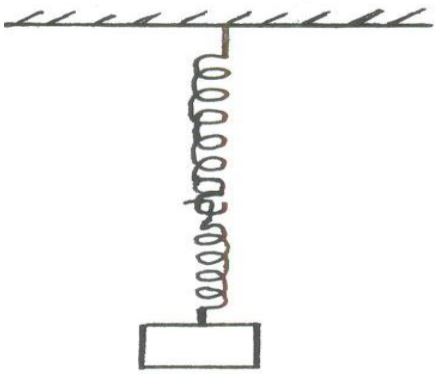
Answer ALL questions

1. The figure below shows a mercury column



Given that the height of the mercury column is calibrated in mm, state the reading of the column height. (1mk)

2. Two springs of negligible weights and of constants K_1 =50N/M and K_2 = 100N/M respectively are connected end to end and suspended from a fixed point as shown in the diagram.



A 200g mass was hung on the lower end.
Calculate the spring constant of the combination. (2mks)

3. A nurse applies a force 30N to syringe. Given that the cross-sectional area of the tip of the needle is $1.0 \times 10^{-7} m^2$, calculate the pressure produced at the tip of the needle. (2mks)

4. Define diffusion (1mk)

5. The pressure exerted by a gas of volume $0.024m^3$ at room temperature is 4.2×10^5 pa. Determine the pressure at which the volume of the gas reduces to $0.018m^3$ at the same temperature. (3mks)

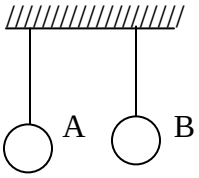
6. State principle of moments. (1mk)

7. Droplets of water sprinkled on greasy glass plate form spherical shapes. Explain (1mk)

8. A boy throws a ball of mass 100g vertically upwards to a height of 5m. Calculate the kinetic energy with which the ball leaves the hand. (2mks)

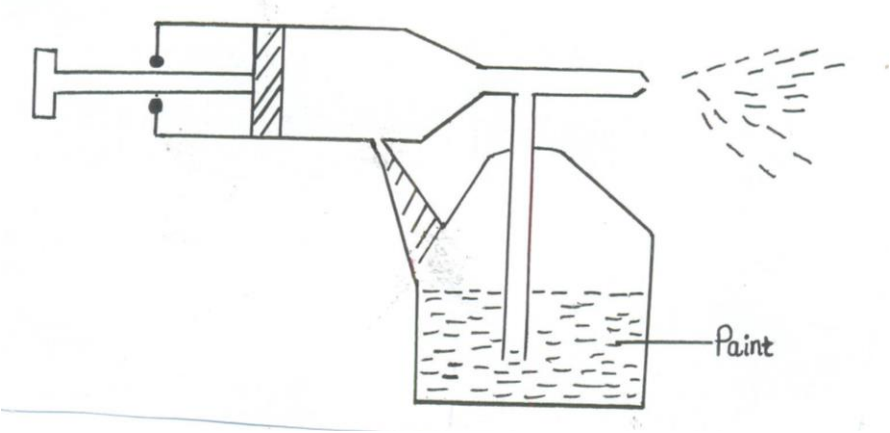
9. Give a reason why a house constructed with concrete beams reinforced with steel does not crack when subjected to temperature changes. (1mk)

10. The figure below shows two balloons inflated with air at room temperature.



Balloon A is painted black and balloon B is painted white. A little amount of ice-cold water is poured on each balloon. State and explain the observation made. (2mks)

11. The diagram shows a paint spray gun.



Explain how the gun works (3mks)

12. A drop of oil of volume $5.0 \times 10^{-3} cm^3$ forms a patch of diameter 35cm on a water surface. Calculate the diameter of a molecule of oil (3mks)

13. A uniform metre rule pivoted at the 70cm mark balances when a mass of 100g is hang at the 90cm mark. Calculate the mass of metre rule. (3mks)

SECTION B (55 MARKS)

Answer all questions

14. (a) Differentiate between distance and displacement (1mk)

(b) A car starts from rest and accelerates uniformly to 15m/s in 5 seconds. It then continues at that speed for 40 seconds and then decelerates uniformly to a stop in 3 seconds.
(i) Sketch the velocity – time graph for the motion. (3mks)

(ii) Determine the distance covered by the car. (2mks)

(iii) Find the average speed of the car during the journey. (2mks)

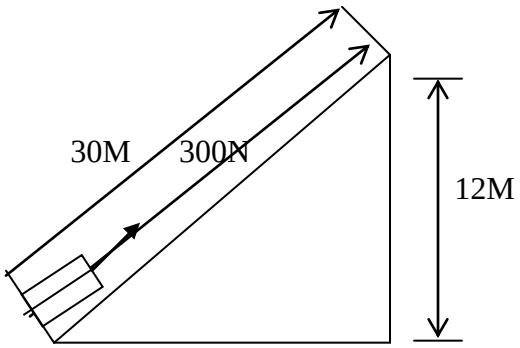
(c) A trolley of mass1.4kg moving at $0.8ms^{-1}$ on a frictionless horizontal surface was acted on by a force of 0.7N. If the resulting speed of the trolley was $1.7ms^{-1}$, determine

(i) the change of momentum of the trolley. (2mks)

(ii) the time interval the force acted on the trolley (2mks)

(iii) the acceleration of the trolley. (2mks)

15. The figure shows a mass of 50kg pulled along an inclined plane by a force of 300N parallel to the inclined plane. The mass moves through a distance of 30m along the plane and rises a vertical height of 12m.



(a) Determine:

(i) The work done on the load. (3mks)

(ii) The work done by the force. (3mks)

(iii) Efficiency of the inclined plane. (2mks)

(b) Give two ways by which the efficiency of the inclined plane can be improved. (2mks)

16. (a) Define heat capacity of a body. (1mk)

(b) Explain why it takes longer to boil water in a sufuria on top of high mountains than at the sea level. (1mk)

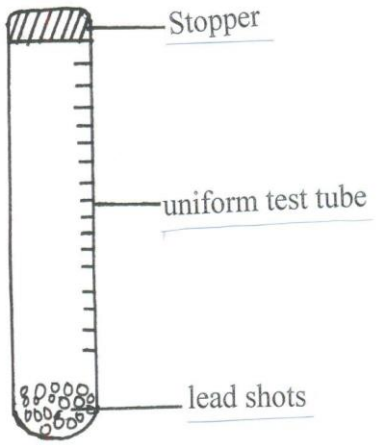
(c) 60g of molten wax at melting point (60^0C) was poured into a copper calorimeter of mass 40g with 100g of water at 18^0C. After stirring, the final temperature was 45^0C. (Specific heat capacity of water = 4200Jkg, specific heat capacity of wax 1600Jkg, specific heat capacity of copper = 400Jkg.)

(i) Calculate the quantity of heat absorbed by the calorimeter and water. (3mks)

(ii) Calculate the specific latent heat of fussion of wax. (4mks)

17. (a) State the Archimede's principle. (1mk)

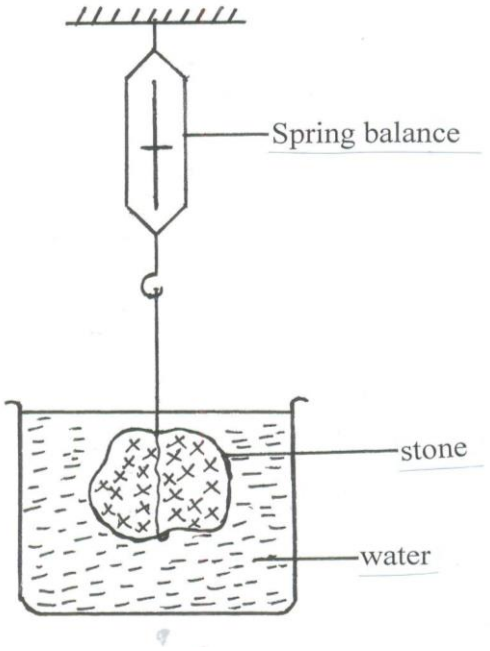
(b) The figure shows a simple hydrometer made of a test tube with lead shots and corked with a rubber stopper.



(i) State the purpose of the lead shots. (1mk)

(ii) State two ways of making the hydrometer more sensitive. (2mks)

(c) The figure below shows a stone of mass 5kg immersed in water and suspended from a spring balance with a string.



9

The density of the stone was 2900kg/m^3 while the density of water was 1000kg/m^3.
Determine the:

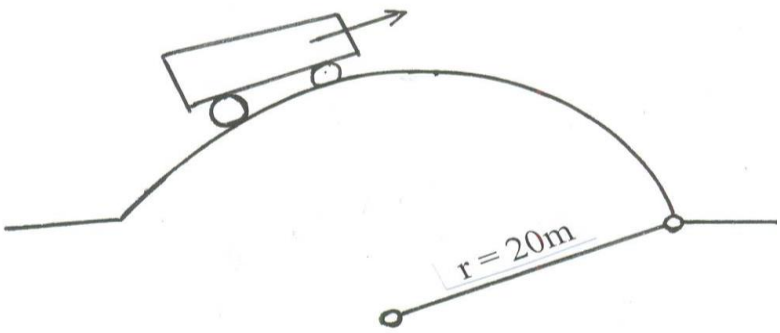
(i) Volume of water displaced by the stone (4mks)

(ii) Upthrust on the stone. (2mks)

(iii) Reading of the spring balance. (2mks)

18. (a) State the factors affecting the centripetal force of a body moving in a circular path. (3mks)

(b) A car of mass 1000kg travels over a lumpback bridge of radius 20m as shown in the diagram.



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Calculate the maximum speed of the car if its wheels are to stay in contact with bridge.
(Take g = 10m/s^2). (3mks)

(c) A toy car moves round a circular track of radius 1m at 10 revolution per second.
Calculate its:
(i) Period (2mks)

(ii) Angular velocity (2mks)

ANSWERS:

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