Name ..... Index No. .....

School .....Candidate's signature .....

Date .....

232/1

PHYSICS
Paper 1
July/August 2016
Time 2 hours

WESTLANDS JOINT EXAMINATION

Kenya Certificate of Secondary Education

PHYSICS

Paper - 232/1

July/August 2016

Time: 2 hours

INSTRUCTIONS TO CANDIDATES

- Write your name and index number in the spaces provided above.
- Sign and write the date of the examination in the spaces provided above.
- This paper consist of two sections A and B.
- Answer ALL questions in section A and B in the spaces provided.
- All working must be clearly shown in the spaces provided in this booklet.
- Non-programmable, silent electronic calculators and KNEC mathematical tables may be used.

EXAMINER'S USE ONLY

SECTION	Questions	Maximum score	Candidate score
A	1 to 13	25	
B	14		
	15		
	16		
	17		
	18		
	19		
This paper consists of 10 printed pages. Candidates should check the question paper to ensure that all the printed pages are printed as indicated and no questions are missing.	TOTAL SCORE	80	

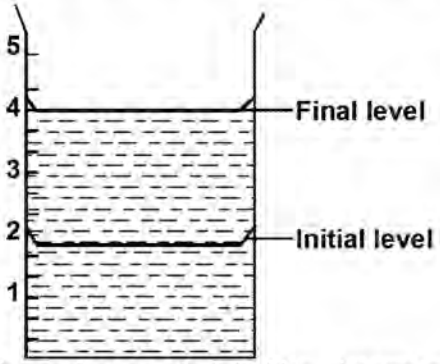
SECTION A (25 marks)

Answer ALL the questions in the spaces provided.

1. Atomic physics is a branch of physics. State what it deals with. (1 mark)

.....

2. A parker pen was accidentally dropped into a measuring cylinder containing water. The volume of water moved from initial level to form the final level as shown below.



If the mass of the parker pen is 0.012kg, determine its density. (2 marks)

.....

.....

3. i) Define a vector quantity. (1 mark)

.....

.....

ii) Which of the following quantities are vectors: mass, weight, power, time, density and velocity. (2 marks)

.....

.....

.....

4. Pressure of a laboratory water tap in a school in Nakuru is 40,000 N/m². Calculate the height of the tank from which the water is supplied.(density of water = 1g/cm³, g=10N/kg) (2 marks)

.....

.....

.....

5. Explain the cause of random motion of smoke particles as observed in Brownian motion experiment using a smoke cell. (1 mark)

.....

.....

6. When a particular substance at a certain temperature is heated, It expands. When the same substance at the same temperature is cooled. It also expands

a) What is the substance. (1 mark)

.....

b) What is the temperature. (1 mark)

.....

6. When a particular substance at a certain temperature is heated, it expands when the same substance at the same temperature is cooled. It also expands

a) What is the substance. (1 mark)

.....

.....

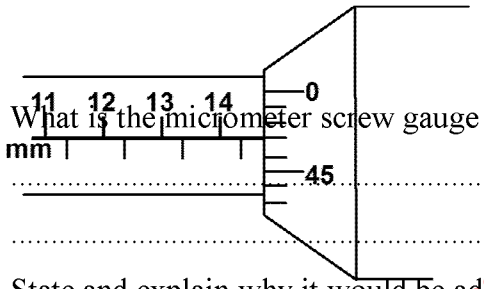
b) What is the temperature. (1 mark)

.....

.....

7.a) Draw a vernier calliper to show a reading of 7.36cm (1 mark)

b) What is the micrometer screw gauge reading in the figure shown below. (1 mark)



.....

.....

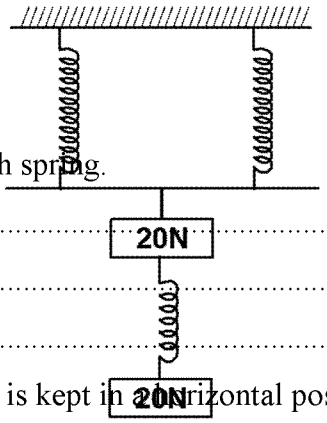
8. State and explain why it would be advisable to use hollow bricks in place of normal building stones in countries which experience winter. (2 marks)

.....

.....

.....

9. The three springs shown below are identical and of negligible weight. The extension on the system of springs is 20cm.



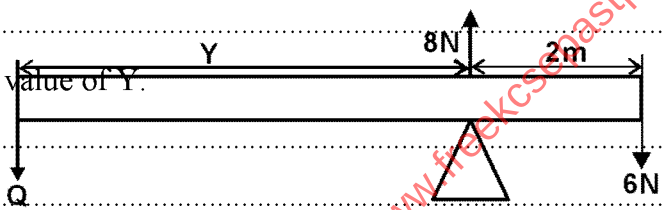
Determine the constant of each spring. (2 marks)

.....

.....

.....

10. A Planck of negligible weight is kept in a horizontal position by the forces shown in the diagram below.



i) Calculate the magnitude of force Q. (1 mark)

.....

.....

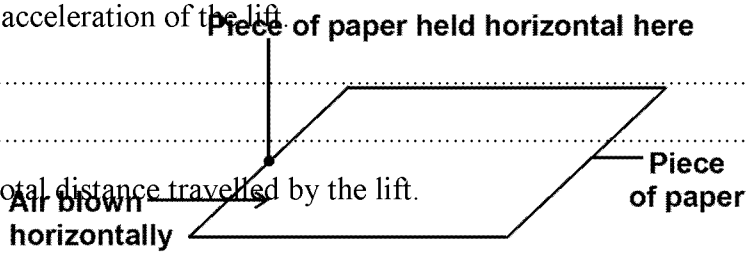
ii) Calculate the value of Y. (2 marks)

.....

.....

.....

11. Air is blown over a piece of paper as shown below. State what is observed.



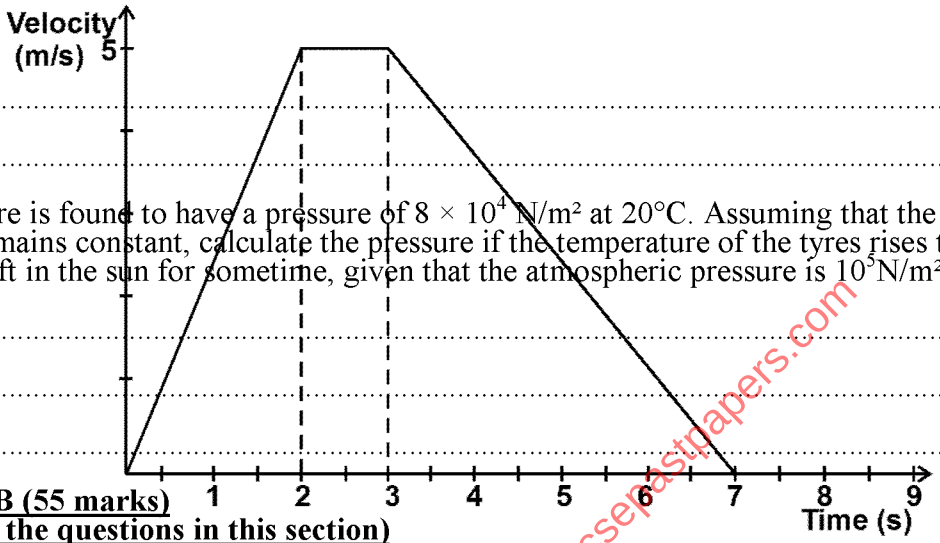
12. The figure represents the velocity-time graph for a lift in a department store. Use the graph to calculate

i) The acceleration of the lift. (1 mark)

.....

.....

ii) the total distance travelled by the lift. (1 mark)



13. A bicycle tyre is found to have a pressure of 8×10^4 N/m² at 20°C. Assuming that the volume of the air inside remains constant, calculate the pressure if the temperature of the tyres rises to 29°C when the tyre is left in the sun for sometime, given that the atmospheric pressure is 10^5N/m² (2 marks)

.....

.....

.....

.....

SECTION B (55 marks)
(Answer all the questions in this section)

14. a) An object which is moving over a horizontal surface slows down until the motion finally gets to zero. Explain what is responsible for this observation. (1 mark)

.....

.....

b) A trolley of mass 5.00 kg rests at a plain horizontal shown below.

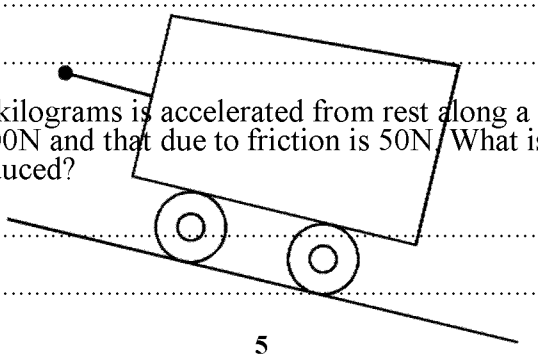
i) Show on the sketch, the forces acting on it when pulled in one direction. (4 marks)

ii) When the trolley is pulled with a horizontal force of 24N, the trolley accelerates at 3m/s². Find the frictional force acting on the trolley. (2 marks)

.....

.....

.....



c) An automobile of mass 500 kilograms is accelerated from rest along a horizontal surface. The force produced by the engine is 300N and that due to friction is 50N. What is the accelerated force and what is the acceleration produced? (2 marks)

.....

.....

.....

15.a) State the energy changes that occur when

i) A man climbs a mountain. (1 mark)

.....

ii) A woman addresses a crowd using a microphone. (1 mark)

.....

b) A machine with a wheel of diameter 1.6m and axle of diameter 0.4m lifts a load of mass 12kg with an effort of 120N. Given that the acceleration due to gravity is $10m/s^2$.
Calculate

i) The velocity ratio of the machine. (2 marks)

.....

.....

ii) The mechanical advantage of the machine. (2 marks)

.....

.....

iii) The efficiency of the machine. (2 marks)

.....

.....

c) A bullet of mass 8×10^{-3} kg is fired horizontally into a block of wood of mass 0.6kg which it knocks and moves with an initial speed of 6m/s. Calculate

i) The speed of the bullet. (2 marks)

.....

.....

.....

ii) The kinetic energy lost in the impact. (2 marks)

.....

.....

.....

16.a) Define the term specific heat capacity of a substance. (1 mark)

.....

.....

b) In an experiment to determine the specific latent heat of vaporisation of water, stream at 100°C was passed into water contained in a well lagged copper calorimeter.
The following measurements were obtained.

Mass of calorimeter = 52g
Initial mass of water = 72g
Initial temperature of water = 6°C
Final mass of water + calorimeter + condensed steam = 127g
Final temperature of mixture = 34°C

(Specific heat capacity of water = 4200J/kgk)
(Specific heat capacity of copper = 390J/kgk)

Determine

i) Mass of condensed steam. (2 marks)

.....

.....

.....

ii) Heat gained by water and calorimeter. (2 marks)

.....

.....

.....

iii) Given that L_V is the specific latent heat of vaporization of steam, write an expression for the heat out by steam. (1 mark)

.....

.....

iv) Determine the value of L. (2 marks)

.....

.....

.....

17. A car runs at a constant speed of 15m/s for 300s and then accelerates uniformly to a speed of 25mls over a period of 20s. This speed is maintained for 300s before the car is brought to rest with uniform deceleration in 30s.

i) Draw a velocity-time graph to represent the journey described above. (3 marks)

From the graph above

ii) find the acceleration while the velocity changes from 15m/s to 25m/s (2 marks)

iii) the total distance travelled in the time described. (2 marks)

iv) the average speed over the time described (1 mark)

18. a) State the Archimedes principles. (1 mark)

b) A rubber envelope of a hydrogen filled balloon having volume of $2m^3$ is held in position by a vertical string as shown below.

The mass of the balloon is 1.3kg. Given that density of hydrogen is $0.1kg/m^3$ density of air is $1.3kg/m^3$. Find

i) total weight of the balloon including the hydrogen gas. (2 marks)

.....

.....

.....

ii) the upthrust. (2 marks)

.....

.....

.....

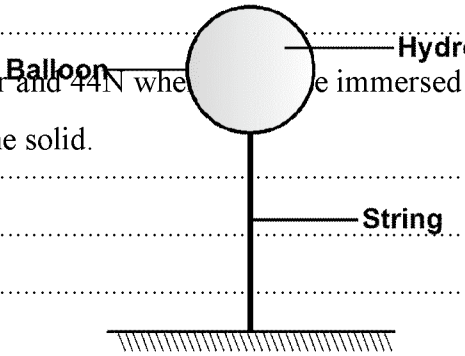
iii) the tension in the string. (2 marks)

.....

.....

.....

c) A solid weighs 50N in air and 44N when it is immersed in water. Calculate



i) relative density of the solid. (2 marks)

.....

.....

.....

ii) density of the solid. (2 marks)

.....

.....

.....

19.a) A stone of mass 450g is rotated in a vertical circle at 3 revolutions per second. If the string has a length of 1.5m, determine:

i) the linear velocity. (3 marks)

.....

.....

.....

.....

ii) the tension of the string at positions A and B. (4 marks)

.....

.....

.....

.....

.....

.....

b) State two factors affecting centripetal force. (2 marks)

.....

.....