Name: . ……..…….. Index No.:……

School:……..…… Adm. No …….

232/1
PHYSICS
Paper 1
July / August 2008
Time: 2 hours

NANDI NORTH DISTRICT MOCK EXAMINATION - 2008

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

232/1
PHYSICS
Paper 1
July / August 2008
Time: 2 hours

INSTRUCTIONS TO CANDIDATES

- Write your name and index number in the spaces provided .
- This paper consists of Two sections: A and B.
- Answer all the questions in section A and B in the spaces provided.
- ALL working MUST be clearly shown.
- Mathematical tables and electronic calculators may be used.

FOR EXAMINER'S USE ONLY

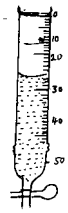
Section	Question	Maximum score	Candidate's score
A	1 – 14	25	
B	15	11	
	16	12	
	17	11	
	18	10	
	19	11	
		80	

This paper consists of 12 printed pages
Candidates should check the question paper to ensure that all the printed pages are printed as indicated and no questions are missing.

SECTION A (25 Marks)

Answer all the questions in the spaces provided.

1. Figure 1 below shows a burette that was initially filled to 10ml.

Fig. 1 

If the volume of liquid removed from the burette has a mass of 11g, determine the density in ggcm^{-3}. (Leave your answer in 2 decimal places.) (2 mks)

2. Figure 2 a & b below shows narrow tubes dipped in mercury and water respectively.

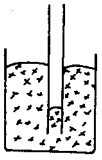
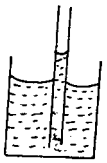
Fig. 2(a) 

Fig. 2(b) 

The temperature of the two liquids in the containers are raised slightly. Indicate the new levels of mercury and water in the tubes respectively. (1 mk)

Use fig. 3 below to answer questions 3 and 4.

Three identical tubes containing mercury were inverted as shown.

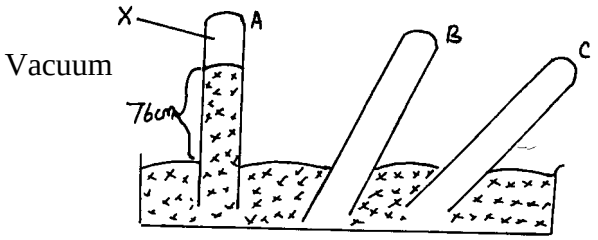


Fig. 3

3. Indicate on the diagram above the levels of mercury in tube B and C. (1 mk)
4. Explain the effect on the level of mercury in tube A if region X is filled with some air. (2 mks)
5. Bromine (Reddish brown vapour) and air were trapped in gas jars A and B and the apparatus arranged as shown in figure 4 below.

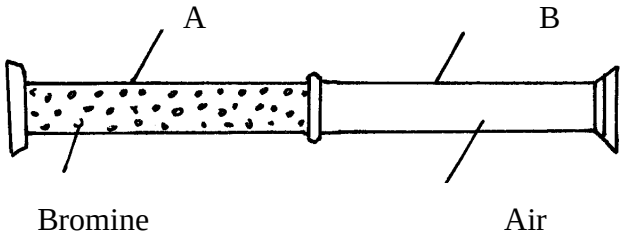
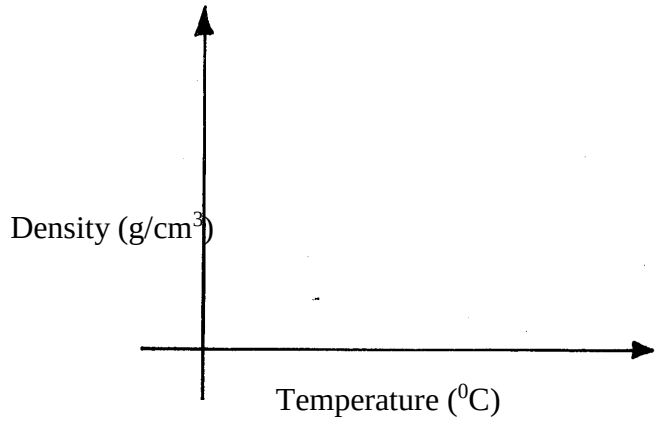


Fig. 4

Explain what is observed if the jars are left for some time. (2 mks)

6. On the axis below, sketch the variation of density of water with temperature if it is heated from 0^0C to 10^0C. (1 mk)



7. A metal gauze is placed above a Bunsen burner .
The gas is put on and the burner is lit as shown in fig. 5 below.

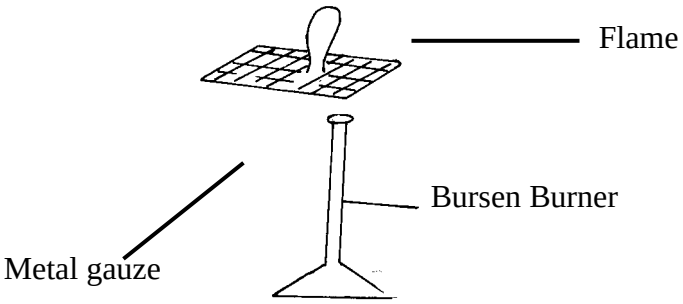


Fig. 5

Explain why the gas burns only above the gauze. (1 mk)

8. Figure 6 below shows a uniform bar of weight 8N. It is acted on by two forces as shown.

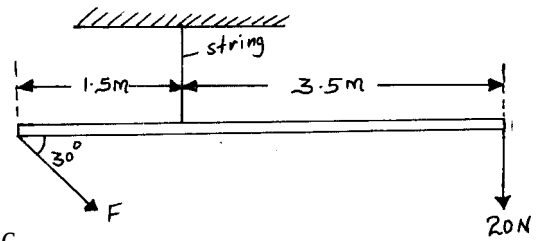
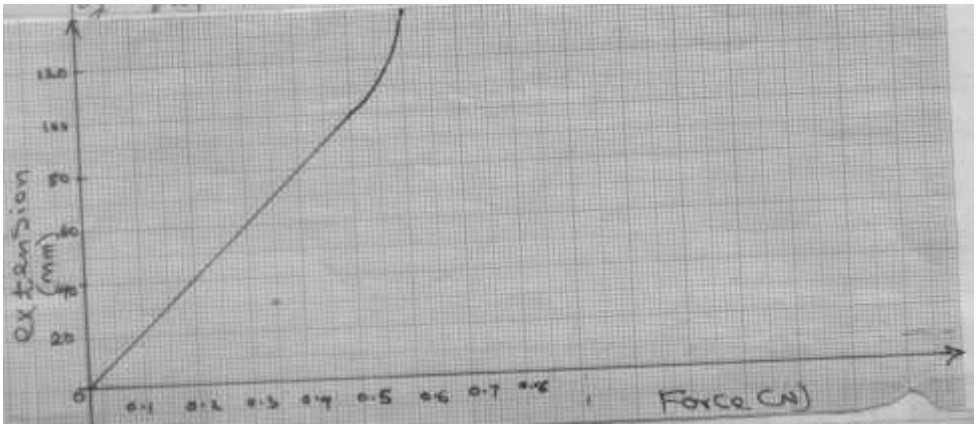


Fig. 6

Determine the value of F. (3 mks)

Use the information in the graph below to answer question 9 and 10.

The graph below was obtained in an experiment to investigate the stretching of materials.



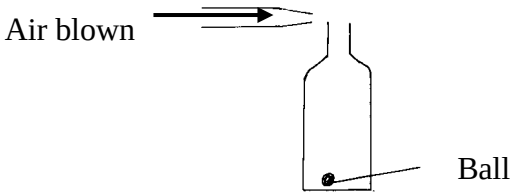
9. Determine the constant of the spring used. (3 mks)

10. Determine the elastic limit of the material. (1 mk)

11. Determine the reading indicated by the scale of the vernier calipers shown in fig. 7 below if it has an error of 0.1mm (2 mks)

Fig. 7

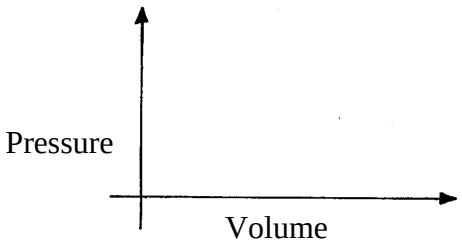
12. Figure 8 below shows a table tennis ball in a container



State and explain what would happen if air is blown over the mouth of the container.

(3 mks)

13. On the axis below, sketch a graph to show how the pressure of a fixed mass of a gas varies with volume at constant temperature. (1 mk)



14. A bus accelerates from 36km/h to 72km/h in 15seconds. Determine the distance covered.

(3 mks)

SECTION B (55 Marks)

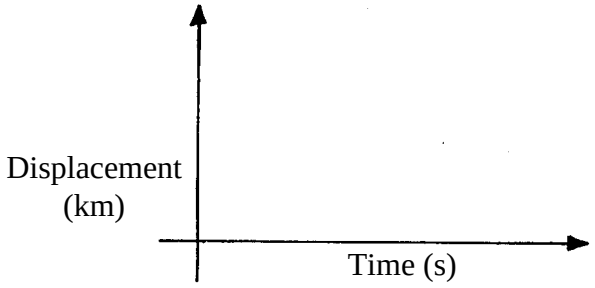
Answer <u>all</u> the questions in the spaces provided.

15. a) Define the term uniform acceleration. (1 mk)

b) A rocket was launched vertically upwards with uniform acceleration of $100ms^{-2}$ for 20 seconds. After this the rocket was acted upon only by a constant gravitational force.

(i) Calculate the maximum height reached by the rocket (3 mks)

(ii) Draw to scale, on the axes provided below, the displacement – time graph for the motion of the rocket. (2 mks)



) (i) State Newton's second law of motion. (1 mk)

(ii) A car of mass 800Kg is initially moving at a speed of 25m/s. Calculate the constant force required to bring the car to rest over a distance of 20m. (4 mks)

16. a) Name <u>one</u> device which changes;

(i) Sound to electrical energy (1 mk)

(ii) Electrical energy to kinetic energy (1 mk)

b) A machine consisting of a wheel of radius 50cm and an axle of radius 10cm is used to lift a load of 400N with an effort of 100N for this system. Calculate;

(i) The mechanical advantage, M.A. (2 mks)

(ii) The velocity ratio, V.R. (2 mks)

(iii) The efficiency of the machine (2 mks)

c) (i) State the principle of moments. (1 mk)

(ii) A 20m uniform plank AB of mass 20Kg is put on a wedge such that it does not balance horizontally. Three pupils of mass 50Kg, 35Kg and 30Kg sit on the plank at a distance 3m, 7m and 18.5m respectively from A. How far must the wedge be placed from A for the arrangement to balance horizontally?. (3 mks)

17. a) Some water is stored in a bag made of a porus material e.g canvas which is hung where it is exposed to a draught of air (wind). Explain why the temperature of the water is lower than that of the air. (2 mks)

b) An iron block of mass 20g is left in water boiling at 95^0C for some minutes then transferred quickly to a well-lagged copper can of mass 40g containing 60g of water at 20^0C. The mixture is well stirred and the final temperature T is noted. Given that the specific heat capacity of copper = $400JKg^{-1}$, Iron = $460JKg^{-1}K^{-1}$ and water = $4200JKg^{-1}K^{-1}$, find the value of T. (4 mks)

c) An immersion heater takes a current of 10A when connected to 240V supply. If it is used to heat 5Kg of water at 20^0C, find the temperature of water after 4 minutes of heating. (3 mks)

d) Figure 9 below is a manometer containing water. Air is blown across the mouth of one tube and the levels of the water changes as shown.

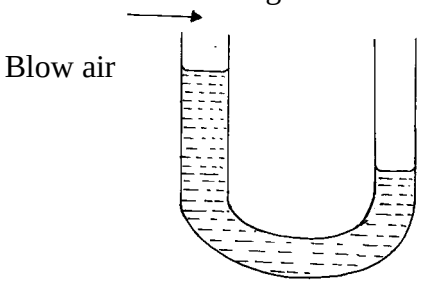
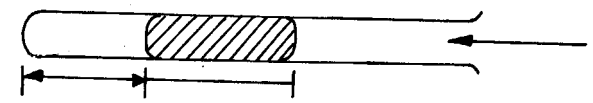


Fig. 1

Explain why the level of water in the left limp of manometer is higher. (2 mks)

18. a) (i) State Boyle's law (1 mk)

b) Air is trapped inside a glass tube by a thread of mercury 250mm long. When the tube is held horizontally, the length of the air column is 250mm.



250mm 250mm

Atmospheric pressure = 760mmHg

Given that the atmospheric pressure is 760mmHg and the temperature is kept constant, calculate the length of air column when the tube is held;

(i) Vertical with the open end up (3 mks)

(ii) Vertical with the open end down (inverted) (2 mks)

c) Explain why;

(i) It is difficult to remove the lid from a preserving jar which was closed when the space above the food was full of steam (2 mks)

(ii) A force pump must be used instead of a lift pump to raise water from a deep well over 10m (2 mks)

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

b) A balloon of volume $2000m^3$ is filled with hydrogen of density $0.09Kg/m^3$. If the mass of the fabric is 100kg and that of the pilot is 75kg, what will be the greatest mass of equipment that can be carried by the balloon when operating in air of density $1.25kg/m^3$ (4 mks)

c) The set up in figure 10 below was used to investigate the variation of the centripetal force with the radius r of a circle in which a body rotates. Various masses were hooked on a thread passing through a glass tubing to balance circular motion as shown in the figure below.

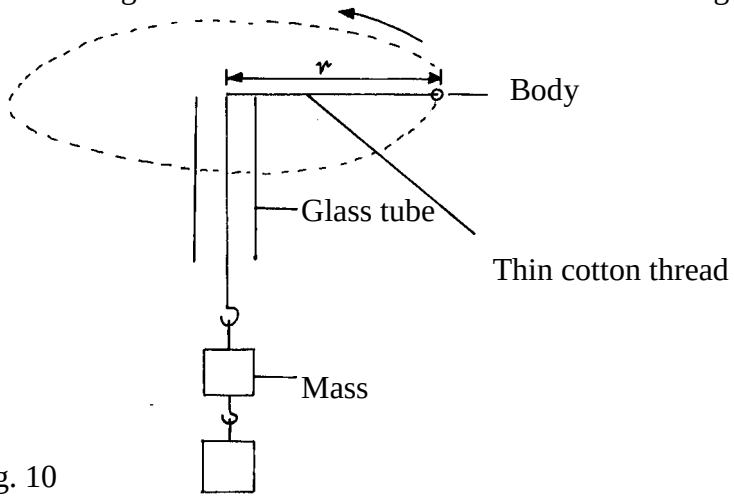


Fig. 10

The following table shows the results obtained from the above experiment.

Radius r (cm)	15	25	34	40	50
Mass, m (kg)	0.02	0.03	0.04	0.05	0.06

(i) Plot a graph of Tension, T (y-axis) in the thread on the body against radius r of the circular motion. (5 mks)

b) Determine the gradient of the graph (3 mks)

c) Use the value of the gradient calculated above to determine the angular velocity *w* of the body. (Take the mass of body = 20g) (3 mks)

END