232 PHYSICS PAPER
FORM 1 END YEAR EXAMINATION 2017
TIME : 2 HOURS

Name…………………………………………………… **Class**…………...

INSTRUCTIONS

- **This paper consists of two sections A and B.**
- **Answer ALL in BOTH sections.**
- **ALL working MUST be clearly shown.**

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| SECTION	MAXIMUM SCORE	CANDIDATE SCORE
A	40	
B	40	
TOTAL	80	

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

SECTION A (40 MARKS)

Answer ALL questions in this section

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

2. A shopkeeper places two identical block of cheese on a set of scale and notices that their combined mass is 240g. Each block measures 2.0cm x 5.0cm x 10.0cm .
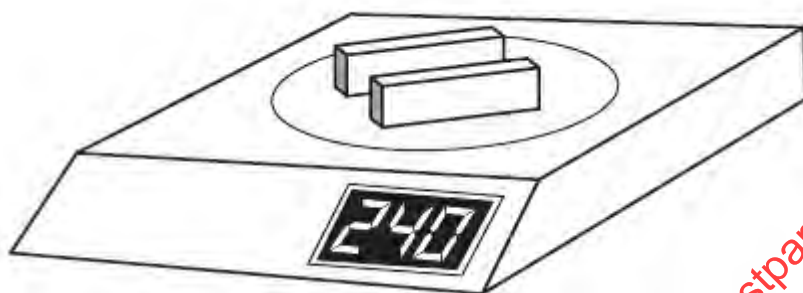
   Calculate the density of the cheese (2 marks)

3. Apart from definitions and SI units, state 2 differences between mass and weight. (2 marks)

4. The total weight of a car with passengers is 25kN. The area of contact of each of the four tyres with the ground is 250 cm^2. Determine the minimum car tyre pressure.
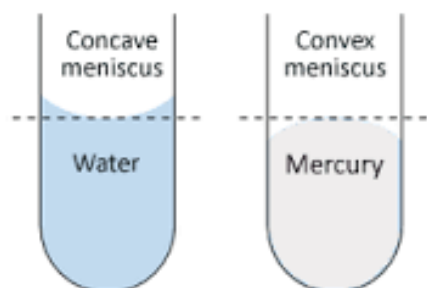
   (4 marks)

5. Classify the following quantities into scalar and vector (4 marks)
   mass, length,time, displacement, density, volume, weight, are

6. Complete the table 1 below (3 marks)

Table 1

Fundamental quantity	SI Unit	Symbol
	Candela	
Temperature		
		A

7. The figure 2 below shows shapes of water and mercury in two glass tubes

Explain the difference in the shapes of their meniscus   (2 marks)

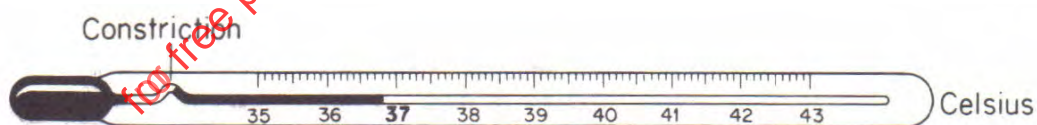7. The figure below shows a clinical thermometer.

Fig. 14.4. Clinical thermometer

(a) Explain the purpose of the constriction.   (1mk)

(b) Give a reason why the thermometer should never be sterilized in boiling water.
(1mk)

(c) Give a reason why the walls of the bulb are thin.   (1mk)

3

8. The mass of an empty density bottle is 20g. Its mass when filled with water is 40g and 50g when filled with liquid X.Calculate the density of liquid X in SI units if density of water is $1000kg/m^3$. (4 marks)

9. Trucks which carry heavy loads have many wheels. Explain. (2 marks)

10. The diagram below shows apparatus used to observe the behaviour of smoke particle in air.
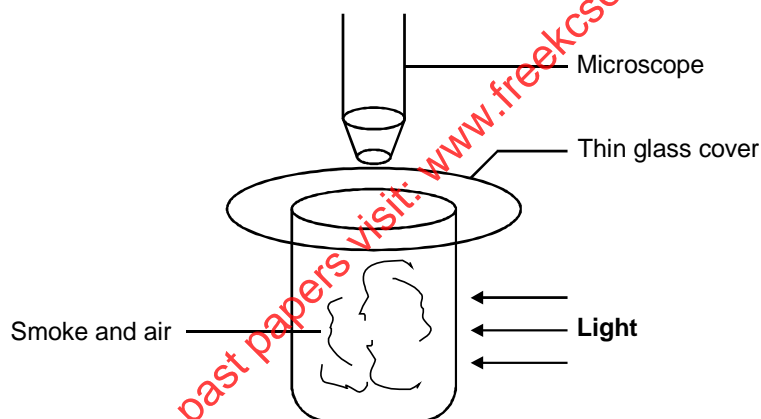
i)Why are smoke particles suitable for use in this experiment. (1 mark)

ii)What does the experiment tell you about the behaviour of the air molecules in the cell? (1 mark)

iii)What difference if any would be seen in the motion of the smoke particles if a weaker light was used.

(1 mark)

11. The barometric height in a town is 70 cmHg. Given that standard atmospheric pressure is 76 cmHg ,density of mercury is 13600kgm^3 and the density of air is 1.25 kgm^3, determine the altitude of the town. (3 marks)

12. Calculate the force exerted on a roof by atmospheric pressure if its surface area is 20000cm^2 and atmospheric pressure is 1 x 10 6 Pa. (3 marks)

13. State 2 effects of anomalous expansion of water. (2 marks)

14. A man wants to fit a brass ring tightly onto a steel rod of diameter equal to the inner diameter of the ring. Explain how this can be achieved. (2 marks)

SECTION B (60 MARKS)

Answer ALL questions in this section.

15. a) Draw a diagram of the apparatus you would use to show by a simple experiment that light travels in a straight line. (3 marks)

b) State the laws of reflection of light. (2 marks)

c) state FOUR characterisctics of image formed by plane mirrors (4 marks)

d) A man sits on an opticians chair looking onto a plane mirror which is 2 m away from him and views the image of a chart which faces the mirror and is 50cm behind his head. How far away from his eyes does the chart appear to be? (2 marks)

16. a) Two similar kettles containing equal volumes of boiling water are placed on a bench. The surface of one is highly polished and the other is covered with soot. Compare the rates of cooling, giving reasons for your answer. (2 marks)

b) The figure 5 below showsa diagram of a thermos flask.Explain the principles on which its action depends. (4 marks)

Vacuum Flask

plastic cup
plastic stopper
double glass wall
vacuum
hot liquid
silvered surfaces
outer casing
felt pads to protect the glass flask which is easily broken.

c) Describe with the aid of a diagram the occurrence of a land breeze. (4 marks)

17. 1000 cm^3 of fresh water with density of 1 000 kgm^{-3} is mixed with 1000 cm^3 of sea water whose density is 3000kgm^{-3}.

Calculate:

(a) The mass of fresh water   (2 marks)

(b) The mass of sea water.   (2 marks)

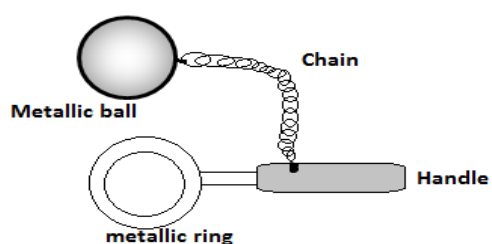(c) Mass of the mixture.   (2 marks)

(d) Volume of the mixture in m^3.   (2 marks)

(e) The density of the mixture.   (2 marks)

18. (a) The experiment below was done by form 1 students.

Ball and ring experiment

Procedure

-Obtain a ball and ring apparatus bigger than the size of the ball.

-Pass the ball through the ring at room temperature.

-Heat the ball using a Bunsen burner for one minute.

-Try to pass the ball through the ring and observe what happens.

-Let it cool for some time and try passing the ball again.

(i) What was the purpose of experiment?   (1 mark)

(ii) What happens when you try to pass the ball through the ring before heating it?

                                                                (1 mark)

(iii) What happens to the ball when heated?   (1 mark)

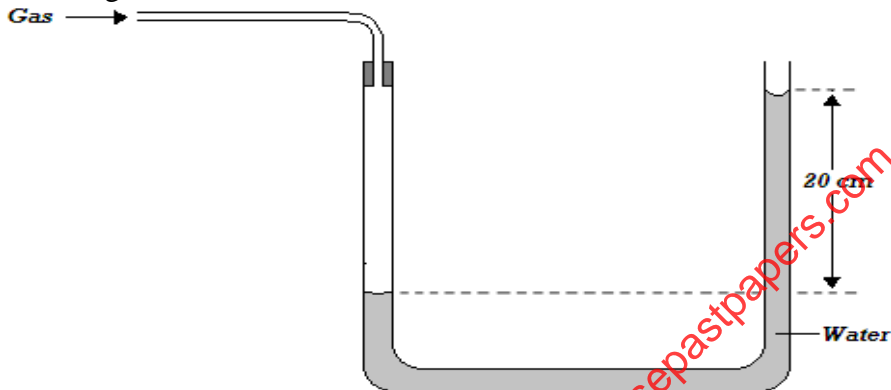(iv) What happens when you try to pass the ball just after heating it? Explain.

                                                                (2 marks)

8

(v) What is observed when you try to pass the cooled ball through the ring?

(1 mark)

19. The height, h of a water manometer is 20 cm when used to measure pressure of a gas.

Gas →

20 cm

Water

a) Determine the pressure due to gas, If atmospheric pressure is 103000N/m^2.

(3marks)

b) What would be the height if the liquid used is glycerin of density 1.26g/cm^3

(3marks)