NAME:…… **INDEX NO:……/……..**

SCHOOL:…… **CANDIDATE'S SIGN……..**

DATE:……

232/1
PHYSICS
PAPER 1
TIME: 2 HOURS

INSTRUCTIONS TO THE CANDIDATES:

1. This paper consists of **TWO SECTIONS** A and B
2. Answer **ALL** questions in the spaces provided.
3. **ALL** working **MUST** be clearly shown.

For Examiners' Use Only

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
I	1 - 11	25	
II	12	10	
	13	10	
	14	11	
	15	10	
	16	14	
TOTAL SCORE		**80**	

SECTION I (25 MARKS)

1. ***Figure 1*** below shows a portion of a micrometer screw gauge used to measure the diameter of a metal pipe . The reading on the gauge when the jaws were fully closed without the pipe was 0.012 cm

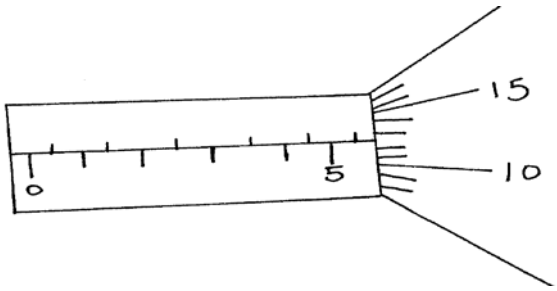

Figure 1

What is the length of the pipe? (2 mks)

2. A bimetallic strip is made from aluminium and copper. When heated it bends as shown in **Figure 2** for the same temperature rise.

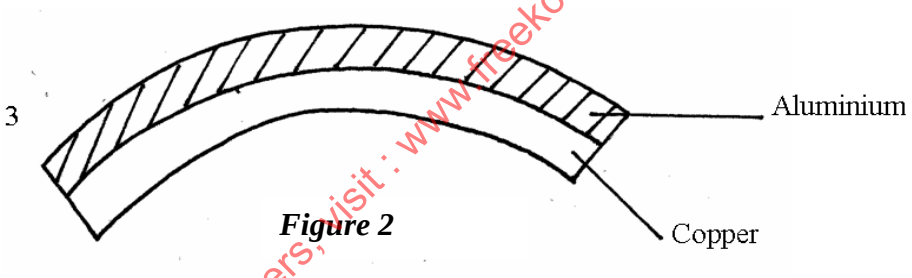

Figure 2

Figure 3

Draw a diagram showing the bimetallic strip after it is cooled below room temperature. (2 mks)

3. Explain the causes of random motion of pollen grains suspended in water as observed in Brownian motion. (2 mks)

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4. State two ways in which the stability of a body can be increased. (2 mks)

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5. A piece of glass weighs 1.02N in alcohol and 1.50N in air. If the density of glass is 2.5g/cm^3. Determine the relative density of alcohol. (2mks)

6. The **figure 3** below shows a velocity time graph for a racing car.

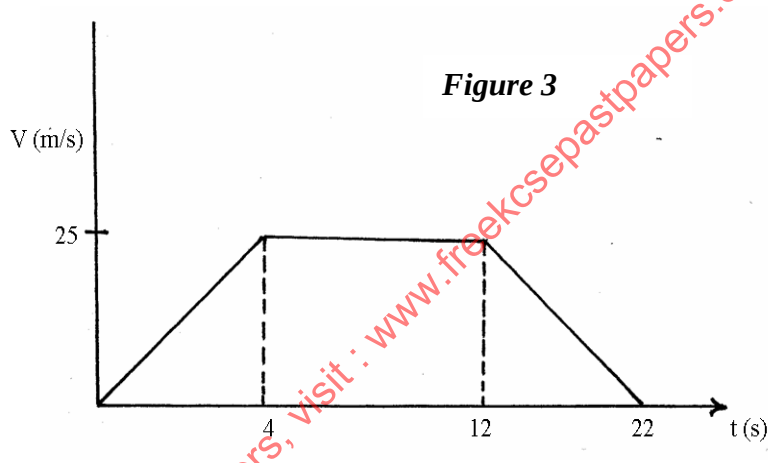

Figure 3

What is the total distance traveled by the car? (3mks)

7. Explain why a liquid and not a gas is used as a hydraulic brake fluid. (1 mk)

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8. **Figure 4** below shows a soap film formed on a metal ring and a loop of thread inside it.

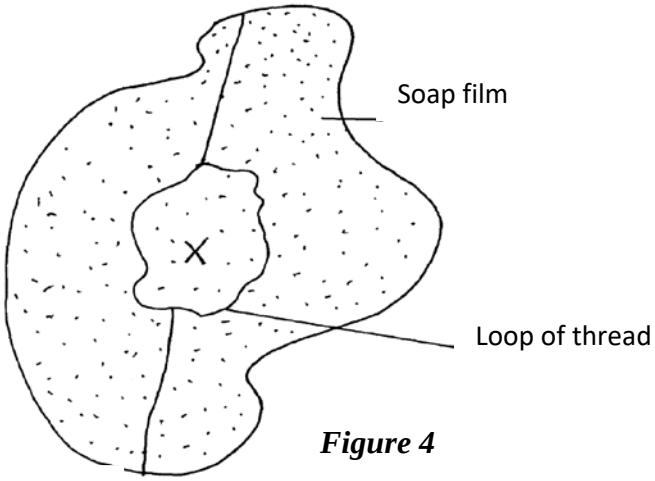

Figure 4

Figure 2

Explain what will happen when the film is punctured at x (2mks)

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9. (a) State Pascal's principle. (1 mk)

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(b) Explain why when air enters hydraulic brake systems the brake fails to work. (1 mk)

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10. State three factors which determine the thermal conductivity in a material. (3 mks)

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11. The figure below shows a metal rod AB of length 2m horizontally balanced while supported by a pivot and a string.

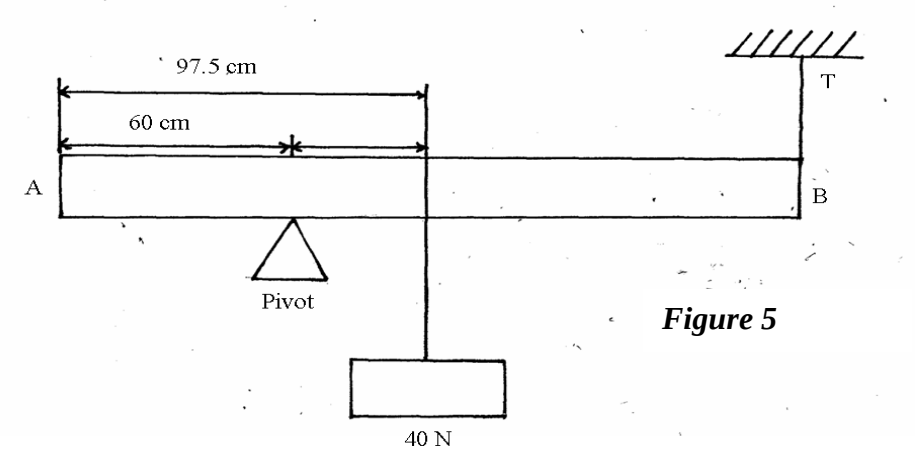

Figure 5

Determine the mass of the metal rod if the tension is 15N. (3 mks)

(b) State the type of equilibrium represented in the **figure 6** below. (1 mk)

Figure 6

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SECTION B 55 MKS

Attempt all Questions in this section.

12. **(a)** State Archimedes' principal (1 mk)

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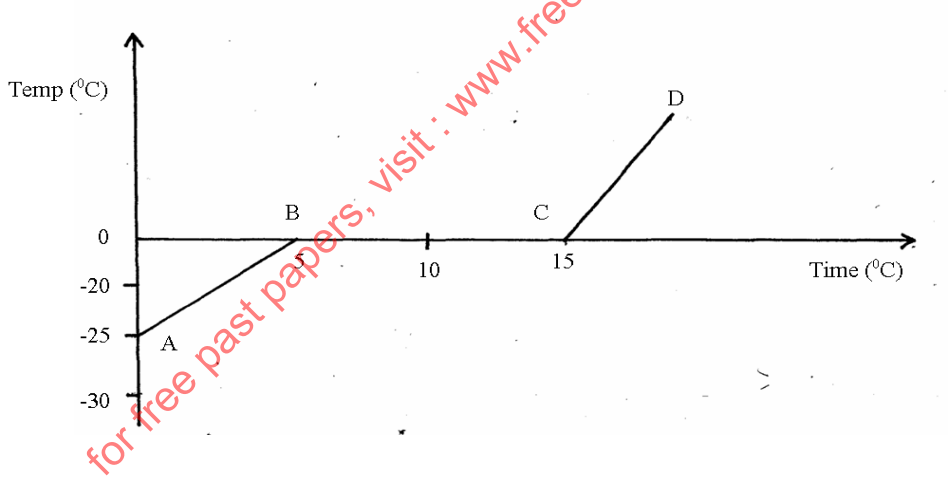
(b) A block of length 40 cm, cross-sectional area of 4cm^2 and density 1.2 g/cm^3 is completely immersed in a liquid of density 1.03 g/cm^3 find

(i) The mass of the block (3 mks)

(ii) The weight of the block in the liquid. (3 mks)

(iii) The apparent loss in weight of the block if three quarter of it is immersed in the liquid (3 mks)

13. The graph below shows how the temperature of a substance was changing with time when warmed by an electric heater which supplied 100 Joules per second.



(a) How much time in seconds is taken by the heater to rise the temperature of the substance from -25^{0}C to 0^{0}C. (1 mk)

(b) How much thermal energy is supplied into the substance along AB? (3 mks)

(c) Determine the specific heat capacity of the substance if its mass is 0.095kg. (3 mks)

(d) What happened to the heat supplied along BC? (1 mk)

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(e) Calculate the specific latent heat of fusion of the substance. (2 mks)

14. (a) Define centripetal force. (1 mk)

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(b) An object of mass 0.5kg is attached to one end of a light inextensible string and whirled up in vertical circle of radius 1.0m and centre O as shown in **figure 7** below such that the lowest point A is at the height of 4 m from the ground.

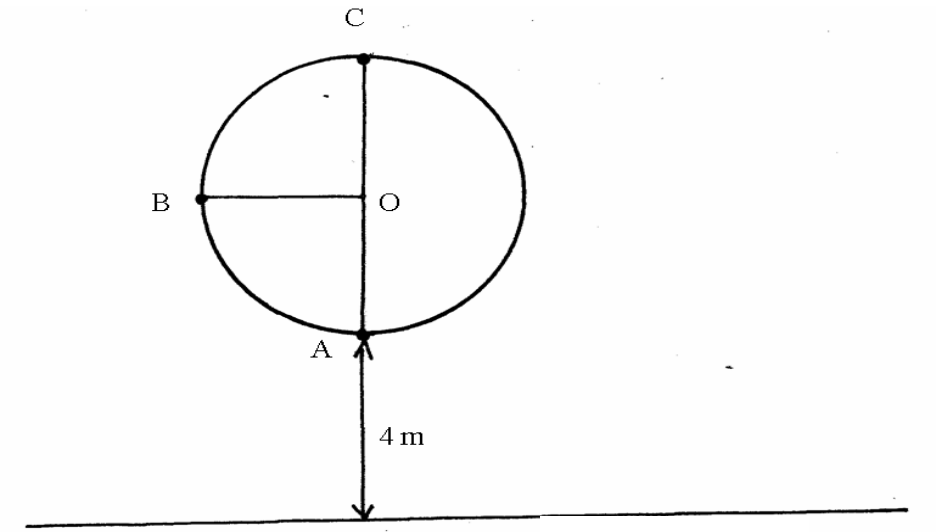

Figure 7

If the tension on the string when the object is at the lowest point A is 13.0N, calculate.

(i) The velocity V of the object. (3 mks)

(ii) The tension on the string when the object is at the

I. Highest point C of the circle. (2 mks)

II. Point B of the circle (1 mk)

(iii) If the string was to break when the objects is at the lowest point A of the circle.

I. Sketch on the diagram the path traced by the object until it hits the ground.

(1 mk)

II. Determine the horizontal distance moved by the stone from the time it leaves the path until it hits the ground. (3 mks)

15. a) What is an ideal gas? (1 mk)

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b) State the pressure law for an ideal gas. (1 mk)

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c) **Figure 8** below shows a simple set-up to verify the pressure law.

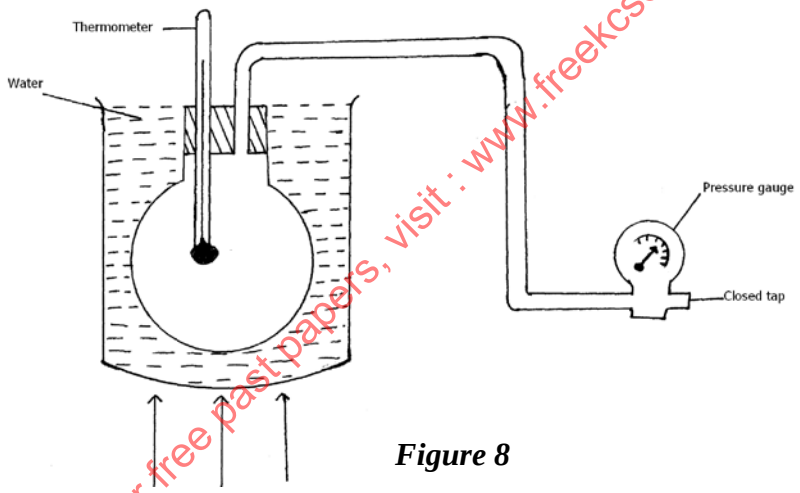

Figure 8

i) State all the measurement to be taken in the above experiment. (2 mks)

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ii) Explain how results from the experiment can be used to determine the pressure law

(3 mks)

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d) A mass of a gas has a vole of 200 cm^3 at room temperature of -74^0c and a pressure of 1

atmosphere. What is its volume at a pressure of 3 atmosphere and a temperature of 27^0c?

(3 mks)

16. (a) An object is thrown vertically upward with a velocity of 150m/s. (Take g=10m/s^{2-})

Calculate

(i) Its velocity after 4 seconds (3 mks)

(ii) The distance covered in the first 5 seconds. (3 mks)

(iii) Maximum height reached. (2 mks)

(iv) Time taken to reach the maximum height. (3 mks)

(b) The vertical column of water issuing from a fountain is found to be 2.45m. Determine the velocity with which water issues from the foundation. (3 mks)