NAME: …… INDEX NO: ……..……

SCHOOL: …… Candidate's signature: ……..……..

Date: ……..……..……

232/1
PHYSICS
PAPER 1
JULY/AUGUST 2011
TIME: 2 HRS

MASINGA DISTRICT JOINT EVALUATION TEST- 2011

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

232/1
PHYSICS
PAPER 1
(THEORY)
TIME: 2 HRS

INSTRUCTIONS

1. The paper consists of two sections, Section **A** and **B**.
2. Answer **ALL** the questions in section A and B in the spaces provided.
3. **ALL** working **MUST** be clearly shown.
4. Mathematical tables and electronic calculators **may be** used.
5. Take g = 10m/s^2 and density of water = 1000kg/m^3, L_V = 2.6 x 10^{6}Jkg^{-1}, L_f= 3.3 x 10^{5}J^{-1}kg

FOR EXAMINER'S USE:

QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
1-11	25	
12	12	
13	12	
14	13	
15	9	
16	9	
TOTAL	**80**	

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

 Turn Over

SECTION A (25 MARKS)

1. The micrometer screw gauge in figure 1 below gives the reading of the diameter of a piece of a wire.

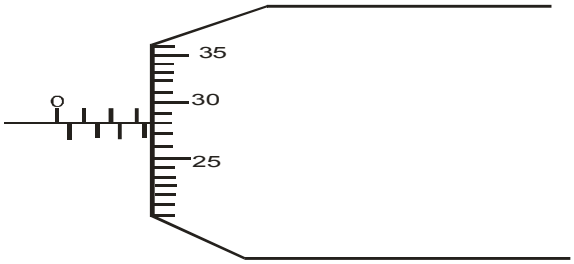
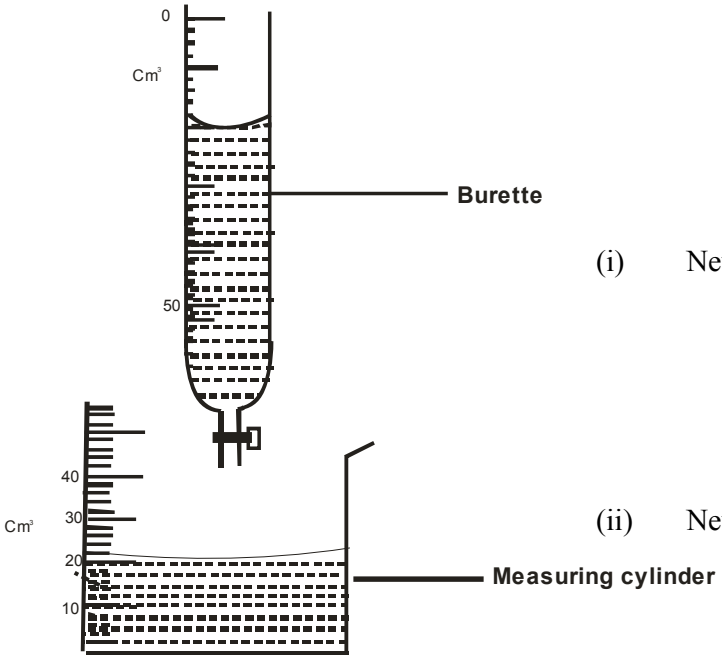


Fig 1

Given that the length of the wire whose diameter was read by using figure 1 above is 4cm, determine the volume of the wire. (2 Marks)

2. Figure 2 below shows a measuring cylinder containing some water.



(i) New reading …… (1 Mark)

(ii) New reading …… (1 Mark)

Fig 2

Another 10 cm^3 of water was added to the cylinder from a burette delivering volume from $0cm^3$ to $50cm^3$. Record in the spaces provided the new reading indicated on each vessel. (2Marks)

3. Explain the cause of random motion of smoke particles as observed in Brownian motion experiment using a smoke cell. (2Marks)

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4. Figure 3 shows a uniform bar of length 1.0 m pivoted near one end. The bar is kept in equilibrium by a spring balance as shown:

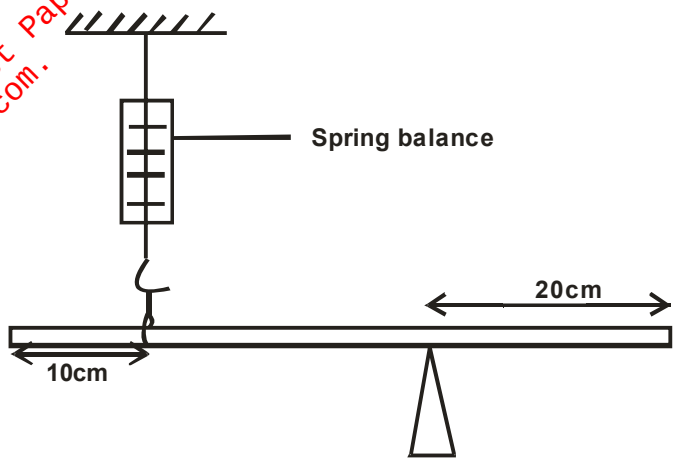

Fig 3

Given that the reading of the spring balance is 0.6 N, determine the reaction force at the pivot.

(3Marks)

5. When a Bunsen burner is lit below wire gauze, it is noted that the flame initially burns below the gauze as shown in figure 4 below. After sometime the flame burns below as well as above the gauze.

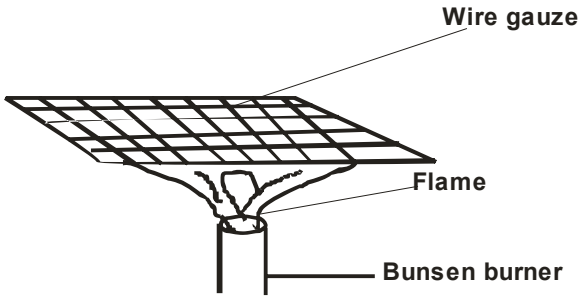

Fig 4

Explain this observation (2Marks)

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6. Figure 5 shows a flask fitted with a tube dipped into a beaker containing water at room temperature. The cork fixing the glass tube is tight.

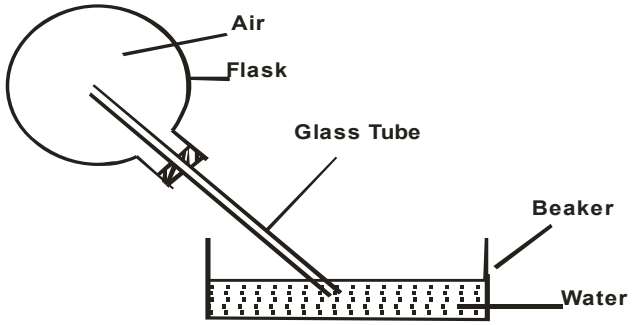

Fig 5

State with reason what would be observed if cold water is poured on to the flask. (2Marks)

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7. State the reason why it is colder during the night when the sky is clear than when it is cloudy.

(1Mark)

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8. Water jets out through small holes at the same height in a tall can as shown in figure 6.

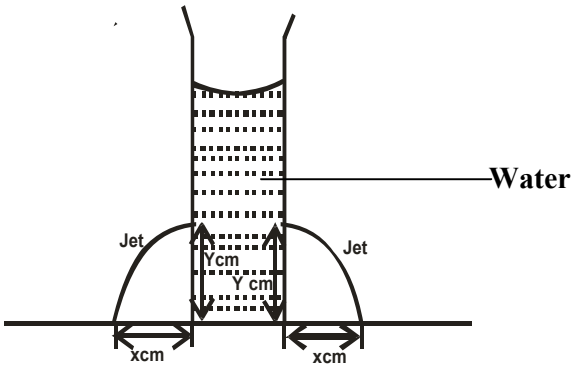

Fig 6

a. State **one** conclusion that can be made from this observation. (1Mark)

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b. Explain **two** adjustments that can be made to increase the distance X without changing the type liquid or the position of the can. (2Marks)

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9. A uniform meter rule is balanced as shown in figure 7.

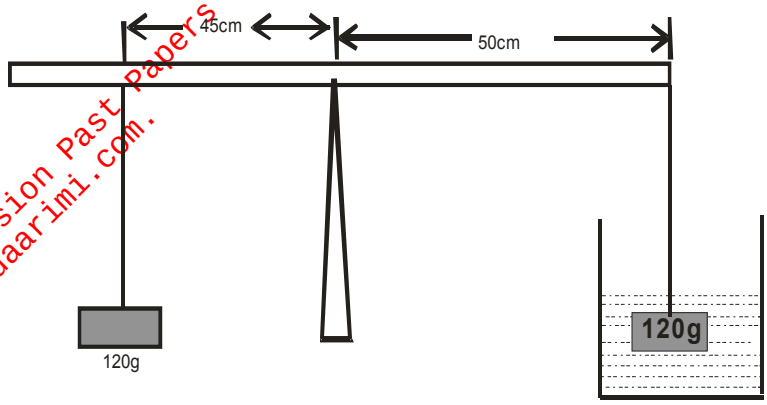

Fig 7

By displacement method, the immersed object is found to occupy 13.5 cm^3. Determine the density of the liquid in SI units. (4Marks)

10. A resultant force F acts on a body of mass M causing an acceleration of A_1 on the body. When the same force acts on a body of mass 2m, it causes an acceleration of A_2. Express A_2 in terms of A_1 . (2Marks)

11. Figure 8 shows a pilt ball being lifted into a funnel end of a blower.

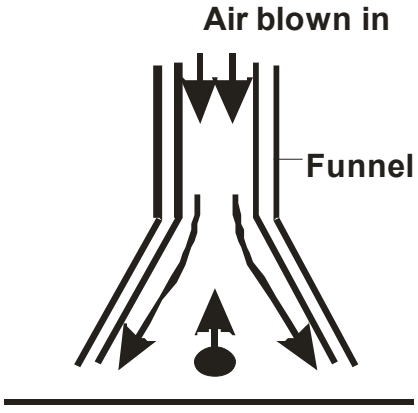

Fig 8

Explain this observation (2Marks)

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SECTION B (55 MARKS)

12. An object is fired vertically upward from the ground level with a velocity of $50ms^{-1}$ and reaches a maximum height, h. It falls back to the ground and bounces to a height of 4m.

a) Sketch a velocity time graph to represent the motion of the object from the time it is fired till it bounces to the height of 4m. (2Marks)

b.) Calculate the maximum height reached h. (2Marks)

c.) Fig 9 represents a wheel and axle used as a machine, whose efficiency is 80% to raise 400N of building materials. The wheel and axle have diameters of 75cm and 15cm respectively.

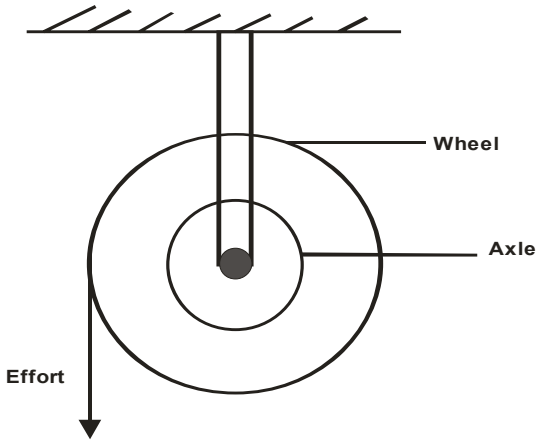

Fig 9

i) Mark on the diagram the correct position and direction of the load to be lifted. (1Mark)

ii) Name the principle on which this machine works. (1Mark)

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iii) Calculate the effort needed to raise the load. (3Marks)

iv) The machine is operated manually and raises the load to a height of 5m in 20 seconds. Calculate the power developed by the operator. (3Marks)

13. a) Define specific latent heat of vaporization. (1Mark)

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b) Steam at 100^{o}c was passed for sometime into ice at 0^{o}c. At the end, temperature of the water obtained was 52^{o}_{C} and its mass 2g. Calculate;

i) The heat lost by steam (3Marks)

ii) Mass of the ice used. (3Marks)

c) Other than using steam, describe briefly using a diagram how you would experimentally determine the latent heat of fusion of ice. (4Marks)

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d) Give a reason why it is not advisable to melt ice directly using an electric heating coil. (1Mark)

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14. a) State Charles law. (1Mark)

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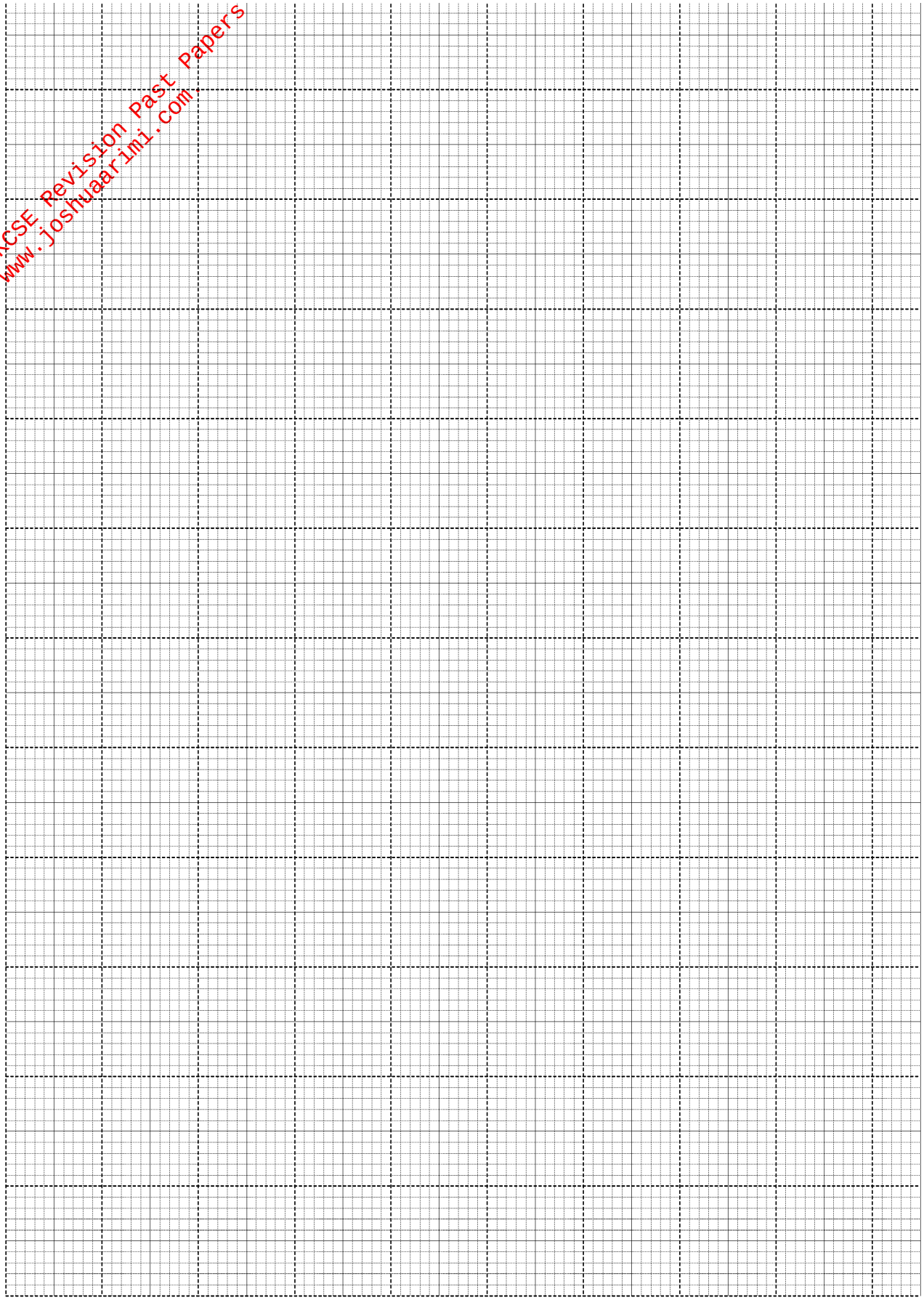
b) The table below shows the volume V of a certain mass of a gas at different temperatures, T, obtained in an experiment to verify Charles law.

V (cm^3)	7.0	7.6	8.2	8.6	8.8
T (^oC)	15	40	65	80	90

i) Draw a set up of apparatus that could be used to verify the law. (2Marks)

ii) Plot a graph of volume (y-axis) against temperature. (5Marks)



iii) From the graph determine the volume of the gas at 0^{o}c. (1Mark)

iv) Use the graph to determine the rate of expansion of the gas. (2Marks)

v) Given that V=KT+C, write down the values of Kand C.(2Marks)

15. a) State Archimede's principle. (1Mark)

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b) A student was provided with water in a beaker, a spring balance, a metal block, a cork and a string. Using the arrangements shown in figure 9 she recorded the following results

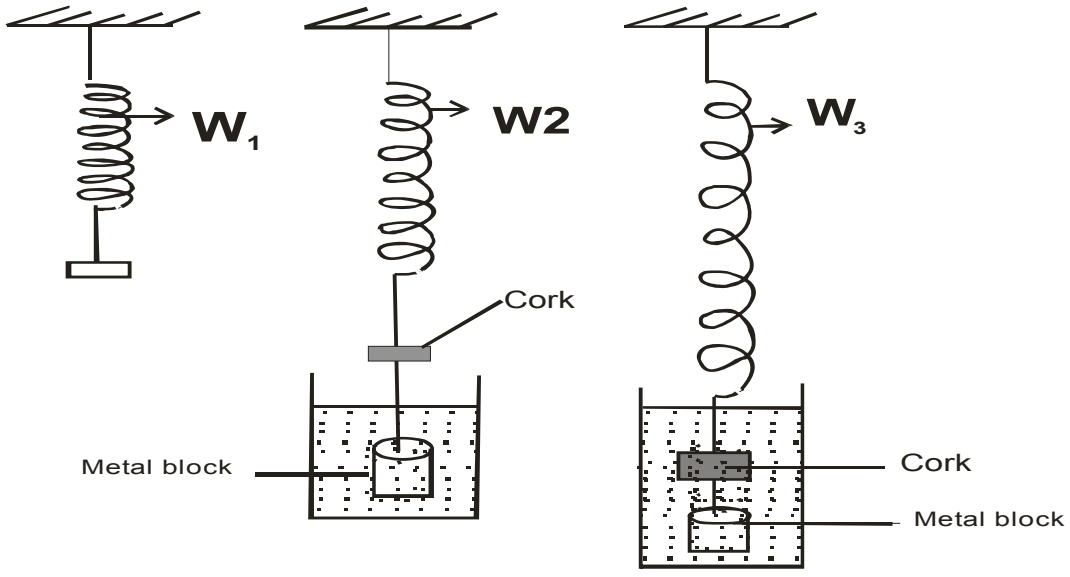

Fig 9

Weight of cork in air = W_1

Weight of cork in air and metal in water = W_2

Weight of both cork and metal in water = W_3

i) Write an expression for the upthrust on the cork in water. (1Mark)

ii) Derive an expression for the relative density of the cork. (3Marks)

c) Apiece of wax of mass 380g and volume 400cm^3 is kept under water by tying with a thin thread to a piece of metal. Determine the tension in thread. (4Marks)

16. a) A body moving in a circular path at constant speed is said to be accelerating. Explain. (1Mark)

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b) Figure 10 below shows a bucket filled with water moving round in a vertical circular path of radius 1m (1Mark).

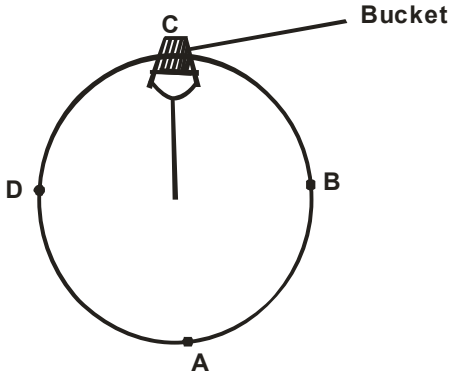

Fig 10

If the mass of water is 5kg and the speed of the bucket is 20m/s;

i) Explain why the water is not falling down when the bucket arrives at point C of the Circular path.

(1Mark)

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ii) What is the net force on water at point C.? (2Marks)

iii) Show by calculation that this net force is greater at point A than at point C. (3Marks)

iv) Calculate the value of the angular velocity (2Marks)