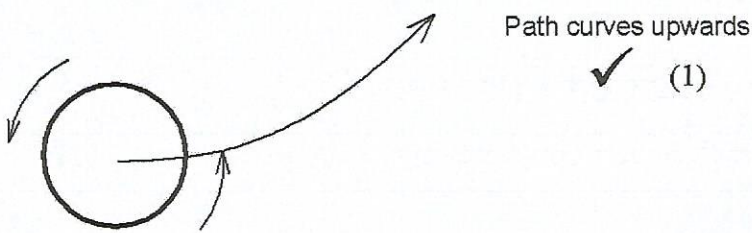
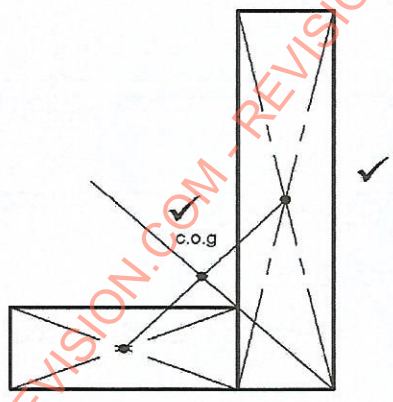
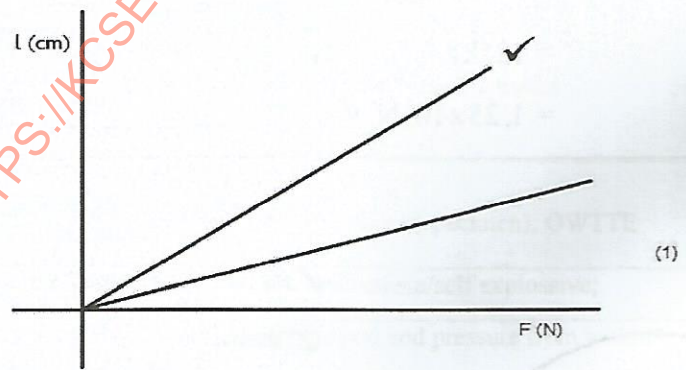


4.6 PHYSICS (232)

4.6.1 Physics Paper 1 (232/1)

SECTION A (25 MARKS)

|    |  |           |
|----|--|-----------|
| 1. | Earth's gravity is higher than the moon's gravity.   | (1 mark)  |
| 2. | $7.3 - 6.0 = 1.3\text{cm}$   | (1 mark)  |
| 3. | <ul style="list-style-type: none"> <li>- Using the same oil spilled, to measure a known volume.</li> <li>- Determine the area of spread of the measured volume (on the same water (sample)).</li> <li>- Estimate the area of spread on the sea.</li> </ul>   | (3 marks) |
| 4. | The tube will be very long ✓ since water has much lower density ✓ than mercury.  | (2 marks) |
| 5. | Milk particles move to occupy the spaces between the water particles through diffusion. ✓  | (1 mark)  |
| 6. | Brass contracts more ✓ than invar hence contracts leaving the side with invar longer ✓ hence the curve.  | (2 marks) |
| 7. | <p>Volume of water displaced = <math>0.5 \times 0.5 \times 0.5</math></p> <p style="padding-left: 40px;"><math>= 0.125\text{m}^3</math></p> <p>W of cube. = weight of water displaced</p> <p>(a floating body)</p> <p style="padding-left: 40px;"><math>= 1 \times 125000\text{g} \checkmark</math></p> <p style="padding-left: 40px;"><math>= 125\text{kg}</math></p> <p style="padding-left: 40px;"><math>= 1,25 \times 10^3\text{N} \checkmark</math></p> | (2 marks) |
| 8. | <div style="display: flex; align-items: flex-start;"> <div style="flex: 1;"> </div> <div style="flex: 1; padding-left: 20px;"> <ul style="list-style-type: none"> <li>✓ Not touching O on y axis &amp; x axis</li> <li>✓ Maximum tension at B</li> <li>✓ Equal tension at A &amp; C</li> </ul> <p>Allow straight line<br/>(3)</p> </div> </div>  | (3 marks) |

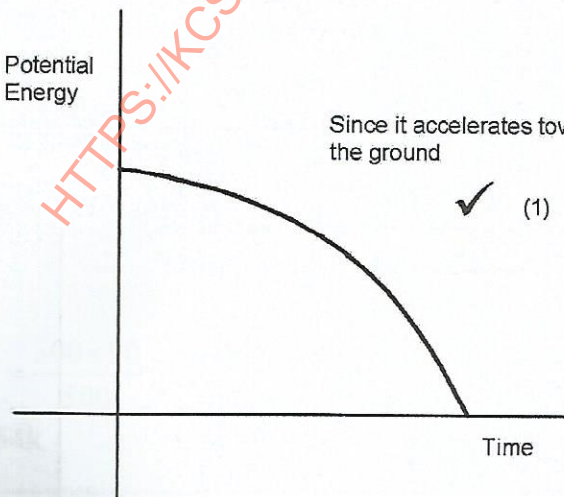
|            |   |                                  |
|------------|---|----------------------------------|
| <p>9.</p>  | <p>(a)</p>  <p>Path curves upwards ✓ (1)</p> <p>(b) Because of Bernoulli's effect caused by difference in air pressure due to the streamlines. As the ball moves ✓ to the right airstreams move to the left ✓. Spin is anti-clockwise, a region of low pressure forms above ✓ lifting the ball.</p> | <p>(1 mark)</p> <p>(3 marks)</p> |
| <p>10.</p> | <p>Boyle's law.</p>   | <p>(1 mark)</p>                  |
| <p>11.</p> |  <p>c.o.g. ✓</p>   | <p>( 2 mark)</p>                 |
| <p>12.</p> |  <p><math>l</math> (cm)</p> <p><math>F</math> (N)</p> <p>(1)</p>  | <p>(1 mark)</p>                  |
| <p>13.</p> | <ul style="list-style-type: none"> <li>- Making the bulb thinner. ✓</li> <li>- Making the bore narrower ✓</li> </ul>  | <p>(2 marks)</p>                 |



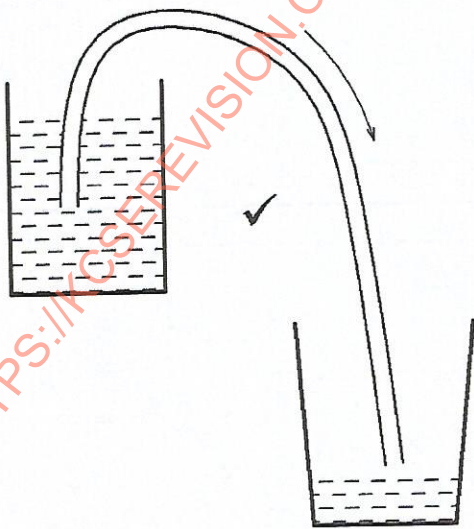
## SECTION B (55 MARKS)

|         |  |  |
|---------|--|--|
| 14. (a) | <ul style="list-style-type: none"> <li>- Boiling takes place at fixed temperature while evaporation takes at all temperatures. ✓</li> <li>- Boiling takes place in the entire liquid while evaporation takes place at the surface. ✓</li> </ul>  | (2 marks)  |
| (b)     | <ul style="list-style-type: none"> <li>- Presence of a vacuum. ✓</li> <li>- Poor conductor material used to make stopper. ✓</li> <li>- Use of glass (poor conductor). ✓</li> </ul>   | (3 marks)  |
| (c)     | <p>(i) Heat lost by steam at 100°C.</p> $ML_v = 5.0 \times 10^{-2} \times 2.26 \times 10^6 \checkmark$ $= 11.3 \times 10^4$ $1.13 \times 10^5 \text{ J } \checkmark$ <p>(ii) Heat lost by hot water to cool to 0°C.</p> $MC\Delta\theta = 5.0 \times 10^{-2} \times 4.2 \times 10^3 \times 10^2 \checkmark$ $= 2.1 \times 10^4 \text{ J } \checkmark$ <p>(iii) Amount of ice melted at 0°C.</p> $M_{\text{ice}} L_f = Ml_v + MC\Delta\theta \checkmark$ $M = \frac{2.1 \times 10^4 + 1.13 \times 10^5}{3.34 \times 10^5} \checkmark$ $= 0.401 \text{ kg.}$ $= 401 \text{ g } \checkmark$ | <p>(2 marks)</p> <p>(2 marks)</p> <p>(3 marks)</p> |

|         |  |  |
|---------|--|--|
| 15. (a) | A body remains in its state of rest or uniform motion in a straight line ✓ unless acted upon by an external force. ✓   | (1 mark)   |
| (b)     | <p>(i) <math>\text{Slope} = \frac{\Delta u^2}{\Delta x}</math> ✓</p> <p><math>= \frac{50-0}{8-0}</math> ✓</p> <p><math>= 6.25</math> ✓</p> <p>(ii) <math>\frac{u^2}{x} = 20k</math> but <math>\frac{u^2}{x} = \text{slope}</math></p> <p><math>k = \frac{\text{slope}}{20}</math> ✓</p> <p><math>= \frac{6.25}{20}</math></p> <p><math>k = 0.3125</math> ✓</p> <p>(iii) <math>K</math> would reduce ✓ since friction has reduced ✓</p> | <p>(3 marks)</p> <p>(2 marks)</p> <p>(2 marks)</p> |
| (c)     | $H_{\max} = \frac{u^2}{2g}$ $= \frac{30 \times 30}{2 \times 10}$ $= \frac{90}{2} = 45\text{m}$   | (3 marks)  |

|         |  |           |
|---------|--|-----------|
| 16. (a) | <p>(i) (I) <math>\text{power} = \frac{\text{Work done}}{\text{time}} \checkmark</math></p> $= \frac{80000}{4}$ $= 20000\text{W} \checkmark$ <p>(II) <math>d = \frac{\text{work}}{\text{force}} \checkmark</math></p> $= \frac{80000}{20000}$ $= 4 \text{ m} \checkmark$ <p>(III) <math>\text{Efficiency} = \frac{\text{Workoutput}}{\text{Workinput}} \times 100\% \checkmark</math></p> $= \frac{20000}{25000} \times 100$ $= 80.00\% \checkmark$ | (2 marks) |
|         |  | (2 marks) |
|         |  | (2 marks) |
|         | (ii) Mechanical energy $\rightarrow$ heat and sound.   | (2 marks) |
| (b)     |  <p>Potential Energy</p> <p>Since it accelerates towards the ground <math>\checkmark</math> (1)</p> <p>Time</p>   | (1 mark)  |



|         |  |            |
|---------|--|------------|
| 17. (a) | Pressure applied at one part in a liquid is transmitted equally to all other parts of the enclosed liquid. ✓   | (1 mark)   |
| (b)     | (i) Liquid y is denser since it rises to a smaller height i.e. the atmospheric pressure supports a lower height of y than x. ✓   | (2 marks)  |
|         | (ii) $h = \frac{2.2}{3.6} \times 20$<br><br>$= 12.22 \text{ cm}$   | ( 2 marks) |
|         | (iii) $\frac{d}{p} = \frac{3.6}{2.2} = 1.636 \checkmark$<br><br>$d = 1.6 p \checkmark$   | (2 marks)  |
| (c)     | (i)  <ul style="list-style-type: none"><li>- Two containers placed such that the levels are at different heights ✓</li><li>- Expel air from the tube after placing in container with liquid ✓</li><li>- Diagram ✓</li></ul> | (3 marks)  |
|         | (ii) – The flushing of a toilet ✓ or<br>Drinking using a straw.  | (1 mark)   |

|         |   |                           |
|---------|---|---------------------------|
| 18. (a) | <ul style="list-style-type: none"> <li>- Mass</li> <li>- Temperature</li> </ul>   | (2 marks)                 |
| (b)     | <p>(i) The gas is less dense than the water. ✓</p> <p>(ii) As it rises the pressure around the bubble reduces and since the temperature is the same, the volume increases. ✓</p>  | (1 mark)<br>(1 mark)      |
| (c)     | <ul style="list-style-type: none"> <li>- The size of the molecules is assumed to be negligible. ✓</li> <li>- Intermolecular forces are also assumed to be negligible. ✓</li> <li>- Real gases can never have zero volume yet the gas laws assume presence of zero volume.</li> </ul> <p>(Any two correct)</p> | (2 marks)                 |
| (d)     | <p>(i) - The pressure law. ✓</p> <ul style="list-style-type: none"> <li>- Has ability to measure the temperature and the pressure while keeping the volume constant. ✓</li> </ul> <p>(ii) - Source of heating for the temperature to be changed. ✓</p>  | (2 marks)<br><br>(1 mark) |
| (e)     | $\frac{V_1}{T_1} = \frac{V_2}{T_2} \quad \checkmark$ $T_2 = \frac{300 \times 90}{500} \quad \checkmark \checkmark$ $= 54k$  | (3 marks)                 |