1. An object is moving in a circle. In what direction does the resultan
   A Outwards from the centre of the circle
   B Towards the centre of the circle
   C At a tangent to the circle in the direction of motion
   D At a tangent to the circle opposite to the direction of motion

2. Which one of these is a unit of angular velocity?
   A ms^{-1} **C** $rad\ s^{-1}$ **D**

3. In a gas, which one of these relationships is correct when oth
   A $P \propto V$ **B** $P \propto T$ **C** $V \propto \frac{1}{T}$ **D**

4. Copy and complete the sentence using words from the list.
   acceleration equal proportional directed towards

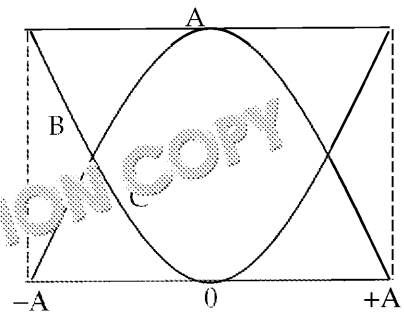
   Simple harmonic motion is a special type of _____ whe
   _____ the equilibrium position and is _____

5. Sketch a displacement–time graph for an object in simple harmonic
   Start your graph with the object in the equilibrium position.

6. The equation for the time period, T, of an oscillating mass-spring sy
   (a) State the quantity represented by k in the equation.
   (b) the equation to explain why the time period of a mass-spri
   arth as on the Moon.
   (c) Calculate T where:
   - $m = 1.5$ kg
   - $k = 2.38\ Nm^{-1}$

   Give your answer to a suitable number of significant figures.

7. The graph shows the variations in energy with displacement in a sin



   (a) (i) State what is represented by line B.
   (ii) Explain why this quantity is maximum at -A and +A.
   (b) Explain why line A shows no variation with displacement.

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8. A passenger in a helicopter notices that the vibration of their seat ch
rotors. At a particular rotor speed, the vibration is maximum. Nam

9. An outdoor swimming pool contains 10^3 kg of water. The pool is s
of concrete. On a sunny day, the water heats up more slowly than th

10. Ethanol and butanol are both liquids at room temperature. A studen
ethanol and butanol in two separate trays with the same surface ar
same temperature. The ethanol evaporates faster. Use the equation

11. In the equation for ideal gases, $pV = nRT$.
(a) State the unit of p
(b) State the quantity represented by n.

12. A fixed mass of gas is heated in a sealed box of constant volume. U
explain what happens to the pressure of the gas as its temperature in

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