

## FORM TWO HOME ASSIGNMENT

### PHYSICS

**NAME:** \_\_\_\_\_

**December, 2018**

#### INSTRUCTIONS

Answer all questions

1.
  - (a) Explain why tractors have wide tyres
  - (b) The density of honey in a tin of cross sectional area  $0.248\text{m}^2$  is  $1004\text{kg/m}^3$ . If the tin column is  $0.5\text{m}$  high calculate the pressure and force the tin exerts at the bottom.
  - (c) In a hydraulic brake system the piston in the master cylinder has a diameter of  $2.0\text{cm}$  and the piston in the slave cylinder have a diameter of  $3.5\text{cm}$ . the brake pedal is pushed down  $10\text{cm}$  with a force of  $50\text{N}$ . How far do the brake shoes move and with what force do they press against the brake drum.
2.
  - (a)
    - (i) State the principle of conservation energy
    - (ii) Mention any four (4) application of the principle of conservation energy.
  - (b) A pendulum bob of mass  $0.8\text{kg}$  is at  $1.2\text{m}$  above the equilibrium level
    - (i) What will be its velocity as it swings through its lowest point?
    - (ii) What is the velocity when it is  $0.01\text{m}$  above the reference level
    - (iii) At what height above the equilibrium level will its velocity be  $2.0\text{m/s}$
3.
  - (a)
    - (i) What is inertia
    - (ii) With examples mention the three types of inertia
  - (b) A  $4\text{kg}$  ball travelling at  $2\text{m/s}$  to the right collides head on with a  $6\text{kg}$  ball traveling at  $2\text{m/s}$  to the left. After the collision the velocity of the  $4\text{kg}$  ball is  $2.8\text{m/s}$  to the left.
    - (i) What is the velocity of the  $6\text{kg}$  object after collision
    - (ii) Was the total kinetic energy conserved during the collision? Justify your answer.
4.
  - (a) Mention the conditions for a body to be in equilibrium
  - (b) A uniform half metre rule is free pivoted at the  $15\text{cm}$  mark and it balances horizontally when a body of mass  $40\text{g}$  is hung from the  $2\text{cm}$  mark
    - (i) Draw a clear force diagram of the arrangement
    - (ii) Calculate the mass of the rule.
5.
  - (a) Define the following terms
    - (i) Electric current
    - (ii) Electromotive force
    - (iii) Potential difference
  - (b) Two resistors  $2\Omega$  and  $6\Omega$  are connected in parallel to a  $3\text{V}$  battery
    - (i) Draw the diagram to show the arrangements of these components
    - (ii) Find the total resistance in the circuit
    - (iii) Find the current in the circuit
    - (iv) What is the current through  $6\Omega$  resistor.