

GHS **MID OF TERM II EXAMIANATIONS** **S.3**
PHYSICS 2 **JULY 2019**
 $1\frac{1}{2}$ HOURS

Instructions:

- Attempt **only three** questions.
- Answers should be written on the answer sheets provided.
- Assume where necessary;
Acceleration due to gravity, $g = 10\text{ms}^{-2}$
Density of water $= 1000\text{kgm}^{-3}$
Density of mercury $= 13600\text{kgm}^{-3}$

- Define the terms
 - velocity. (1mark)
 - acceleration. (1mark)
 - Draw a sketch velocity-time graph for a body moving with;
 - uniform velocity. (1mark)
 - uniform deceleration then constant velocity. (1mark)
 - A car starts from rest and travels with uniform acceleration of 5ms^{-2} for 5 seconds. It then maintains the velocity for 30 seconds and decelerates uniformly to rest in the next 15 seconds.
 - Draw a velocity-time graph for the motion of the car. (3marks)
 - Calculate the total distance travelled by the car. (4marks)
 - What is the car's average speed? (3marks)
 - A stone is thrown vertically upwards with a velocity $V\text{ms}^{-1}$. Explain how its velocity varies from the time it is released up to the time it returns to the point of projection. (2marks)
- Define the following terms as applied to wave motion.
 - wavelength. (1mark)
 - period. (1mark)
 - transverse wave. (1mark)
 - A string fixed at both ends is plucked in the middle and it vibrates in its fundamental mode. If the string is 75cm long and vibrates with a velocity of 15ms^{-1} .
 - draw a sketch of the stationary wave formed. (2marks)
 - calculate the fundamental frequency. (2marks)
 - Describe an experiment to demonstrate that sound requires a material medium to travel through. (5marks)
 - Explain how a stationary is formed. (2marks)
 - state any two properties of stationary waves. (2marks)
- Define the term spring constant. (1mark)
 - State the SI unit of a spring constant. (1mark)
 - State Hooke's law. (1mark)
 - Describe an experiment to verify Hooke's law. (6marks)

- (c) A mass of 0.5 kg causes a spiral spring to extend by 4cm. Calculate the force that would cause an extension of 6 cm. (3marks)
- (d) Distinguish between the force of cohesion and force of adhesion. (2marks)
- (e) Give scientific reasons for the following statements.
 (i) Water wets glass. (2marks)
 (ii) Water meniscus is concave. (2marks)
4. (a) Define the following terms
 (i) Linear magnification. (1mark)
 (ii) Centre of curvature of a concave mirror. (1mark)
- (b) (i) Describe an experiment to locate the center of curvature of a concave mirror using an illuminated object. (4marks)
 (ii) State two uses of a concave mirror. (2marks)
 (iii) An object is placed 3cm in front of a convex mirror of radius of curvature 18cm. Find the position, nature and magnification of the image formed. (6marks)
- (c) (i) Define a parabolic mirror. (1mark)
 (ii) State one use of a parabolic mirror. (1mark)
5. (a) (i) With the aid of a diagram explain magnetic keepers. (3marks)
 (ii) Sketch the magnetic fields for a bar magnet placed in the earth's magnetic field with its North pole facing geographical North and its south pole facing geographical south. (2marks)
- (b) (i) Distinguish between soft magnetic material and hard magnetic Material. (2marks)
 (ii) Describe an experiment to compare magnetic properties of iron and steel. (4marks)
- (c) Distinguish between ferromagnetic and paramagnetic materials. (2marks)
- (d) Sketch the electric fields around two vertical identical wires carrying same magnitude of currents in the same direction and state what happens to the wires. (3marks)
6. (a) Describe an experiment to prove the principle of moments. (5marks)
- (b) (i) What is meant by centre of gravity? (1mark)
 (ii) State two factors which affect the stability of a body. (2marks)
 (iii) Explain how each of the factors mentioned in (b) (ii) above affect stability of the body. (2marks)
- (c) In a hydraulic machine, a force of 120N acts on a smaller piston of area $5.03 \times 10^{-3} m^2$ to lift a load placed on the larger piston of area $3.54 \times 10^{-2} m^2$. Determine the weight of the load. (3marks)
- (d) Explain how atmospheric pressure is useful to a person drinking using a straw. (3marks)

END.