END OF TERM ONE 2019

PHYSICS SENIOR THREE

PAPER TWO

2HRS

INSTRUCTIONS

Attempt only five questions

1. (a) state;
   (i) Archimedes' principle
   (ii) The law of floatation

   (b) A block of wood of volume 300cm^3 floats with $\frac{3}{4}$ of its volume immersed.

   Find the; (i) mass of the wood

   (ii) Fraction of the block that sinks when it is placed in oil of density 0.842gcm^{-3}

   (c) Describe an experiment to demonstrate the existence of surface tension

2. (a)State the laws of reflection of light
   (b) Describe an experiment to demonstrate the principle of reversibility of light.
   (c) An object is released from a height of 20m above a plane mirror. What distance must it drop through in order to be 10m away from its image?
   (d) What is meant by focal length of a lens?
   (e) Calculate the power of a concave lens of focal length 20cm.
3. (a) (i) Define pressure and state its SI unit.

   (ii)Explain why the balloon in a room bursts when the temperature of the room increases.

   (b)

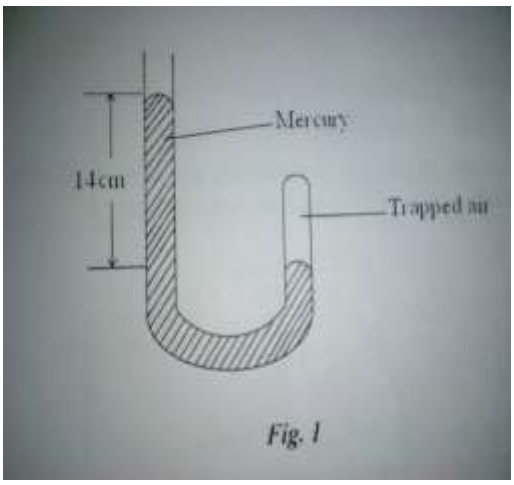

Fig. 1

A gas is trapped by mercury in a J- tube at atmospheric pressure 760mmHg as shown in fig 1 above. Calculate the pressure exerted by the trapped gas in Nm^{-2}.

(c) Describe with aid of a labeled diagram, how a force pump works.

(d) (i) State the law of conversation of energy.

(ii) A stone of mass 0.2kg is thrown vertically upwards and attains a maximum potential energy of 16J. Calculate its initial velocity.

4. (a) (i) What is a machine
   (iii) With aid of relevant examples, give the three classes of levers.

   (b) A lifting tackle has 2 pulleys in each block. An effort of 40N lifts a load of 120N. Calculate the;

   (i) Mechanical advantage

   (ii) Efficiency of the machine

   (c) (i) State Hooke's law

   (ii) Describe an experiment to verify Hooke's law.

5. (a) Explain with the aid of a ray diagram the formation of umbra and penumbra.
   (b) (i) What is meant by reflection and refraction of light
   (ii) Draw a ray diagram to show the action of a converging lens as a magnifying glass.
   (c) Briefly explain why we are unable to see objects which are behind us
   (d) Sketch and explain how the eclipse of the sun occurs.
6. (a) define the following terms
   (i) Resistance
   (ii) Potential difference
   (iii) Emf

(iv) Volt

(v) Coulomb

(b) What is the difference between series and parallel arrangement of resistors?

(c) Two resistors of 3Ω and 6Ω in parallel are connected across a battery of emf 12V and internal resistance of 1Ω. Calculate

(i) The effective resistance

(ii) The current flowing through the system

(iv) The current through the 3Ω resistor

(v) The power dissipated in 6Ω resistor.

7. (a) Define work, energy and power

(b) A body is raised above the ground and then released. State the subsequent energy changes that occurred.

(c) Two forces of 6N and 8N act at a point at right angles to each other. Find the magnitude of the resultant force.

(d) A man exerts a force of 30N to push a stone through a distance of 10m on a horizontal ground in a time of 1minute. Find

(i) Work done by the man

(ii) Power expended

(e) (i) What is meant by Friction?

(ii) Give three uses and three disadvantages of friction

END