CANDIDATES NAME:.....

INDEX NUMBER							

SIGNATURE: .....

535/2
PHYSICS
PAPER 2
JUNE/JULY
2 HOURS 15 MINUTES

MOCK EXAMINATIONS SET 1 2019

Uganda Certificate of Education

PHYSICS
PAPER 2

2 HOURS 15 MINUTES

INSTRUCTIONS TO CANDIDATE:

- *Answer five questions.*
- *Any additional question(s) answered will not be marked.*
- *Mathematical tables, and silent non – programmable calculators may be used.*
- *These values of physical quantities may be useful to you.*

  - Acceleration due to gravity = $10ms^{-2}$
  - Specific heat capacity of water = $4200Jkg^{-1}k^{-1}$
  - specific heat capacity of copper = $400JKg^{-1}K^{-1}$
  - specific latent heat of fusion of water = $340,000JKg^{-1}$
  - specific latent heat of vaporization of water = $2,260,000JKg^{-1}$
  - density of water = $1000Kgm^{-3}$
  - speed of sound in air = $320ms^{-1}$
  - velocity of electromagnetic waves = $3.0 \times 10^{8}ms^{-1}$

1. a) Define density and state its SI unit. (2 marks)

   b) With the aid of a labelled diagram, describe the motion of bearing which is dropped centrally into tail jar containing oil. (4 marks)

   c) i) State Archimedes' principle. (1 mark)

   ii) An object weighs 30N in air and 20N when immersed in water of density $1000kgm^{-3}$. If the same object weighs 22N when immersed in methylated spirit, what is the density of the spirit? (5 marks)

   d) Explain why a ship is able to float on water despite being made of metal. (4 marks)

2. a) What is meant by the term pressure? (1 mark)

   b) i) Explain why one feels more pain when pricked with a needle than when pricked with a nail. (5 marks)

   ii) State the assumption made. (1 mark)

   c) With the aid of a labelled diagram, explain how a force pump works. (6 marks)

   d) Calculate the pressure exerted on the ground by a box of mass 10kg when corresponding area of contact is $2m^2$. (3 marks)

3. a) i) Describe an experiment to show that light travels in a straight line. (4 marks)

   ii) An object 3cm high is placed at right angle to the principle axis of the concave mirror of focal length 7.5cm. If the object is 30cm from the pole of the mirror, construct a ray diagram to obtain.

   1. Position of the image formed (3 marks)
   2. Size of the image. (2 marks)

   b) State two applications of concave mirrors. (2 marks)

   c) State the laws of refraction of light. (2 marks)

   d) Light of the same wave length is incident from air to glass of refractive index 1.5. If the angle of incidence is 60^0, find the angle of refraction. (3 marks)

4. a) Define the following terms as applied to waves.

   i) Amplitude (2 marks)

   ii) Frequency. (2 marks)

   b) i) What is meant by interference of waves? (4 marks)

   ii) Using a labelled diagram, show how circular waves are reflected from a straight barrier. (3 marks)

c) i) Use a labelled diagram to show the main bands of an electromagnetic spectrum. (5 marks)

ii) Calculate the frequency of a radio wave of wave length 2m. (2 marks)

d) State any three effects of electromagnetic radiation on matter. (3 marks)

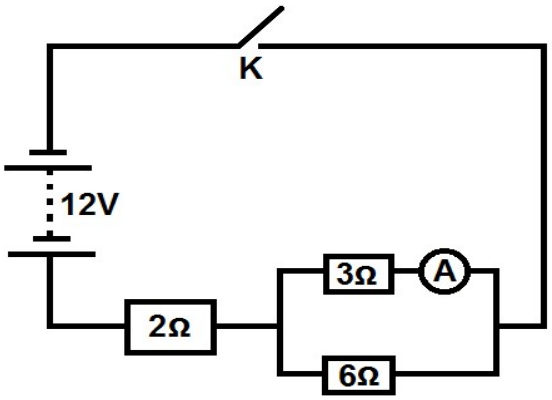
5. a) Define the following terms.

i) Volt (4 marks)

ii) Electrical resistance (4 marks)

b) List 3 ways by which the life of an accumulator can be prolonged. (3 marks)

c)



A battery of e.m.f 12V and negligible internal resistance is connected to resistance 2Ω, 3Ω and 6Ω as shown in the figure. Find the reading of the ammeter when K is closed. (4 marks)

d) A bulb is rated 10.0w when used on a 12.0V supply.

i) How much current does it draw from the supply? (2 marks)

ii) What is its resistance? (2 marks)

e) State three physical properties that affect the resistance of a solid conductor. (3 marks)

6. a) Define the following terms.

i) Atomic number (3 marks)

ii) Mass number (3 marks)

iii) Isotopes (3 marks)

b) A radioactive nucleus decays by emission of Alpha particles.

i) What is an alpha particle? (4 marks)

ii) What changes occur in mass and atomic number when the alpha particle is emitted? (2 marks)

iii) State any three differences between alpha particles and beta particles. (3 marks)

c) The table below shows the count rates of a certain radioactive material.

Time (minutes)	Count rate (S^{-1})
0	6400
1	5380
3	3810
5	2700
7	1910
9	1350

Plot a graph of count rate against time and use it to find the half-life of the material.

d) Describe the composition of the ${}^{23}_{11}Na$. (2 marks)

7. a) State the kinetic theory of matter. (1 mark)

b) State the law of volume and temperature. (1 mark)

c) The volume of a fixed mass of ages at a given pressure is $1.5m^3$ at 300K. At what temperature will the volume of the gas be $0.5m^3$ at the same pressure? (3 marks)

d) i) Differentiate between conduction and convection. (3 marks)

ii) Draw a labelled diagram of a vacuum flask. (3 marks)

iii) Explain how a vacuum flask minimizes heat losses. (3 marks)

e) Why is a car radiator made of fins painted black? (3 marks)

8. a) i) What is a magnetic field? (1 mark)

ii) State the law of magnetism. (1 mark)

b) i) Explain with the aid of diagrams how a steel bar can be magnetized by the single touch method. (4 marks)

ii) Sketch the magnetic field pattern around two bar magnets whose North poles face each other. (2 marks)

c) i) Describe an experiment to distinguish between soft and hard magnetic materials. (4 marks)

ii) State one instance in which each of these materials in c(i) is used. (2 marks)

d) Define the following terms:

i) Angle of inclination (1 mark)

ii) Angle of declination (1 mark)

END