535/2
PHYSICS
Paper 2
2¼ Hours

KING'S COLLEGE – BUDDO

Uganda Certificate of Education
INTERNAL MOCK EXAMINATION 2020
PHYSICS
PAPER 2
2 Hours 15 Minutes

INSTRUCTIONS TO CANDIDATES

- *Attempt **any five** questions.*
- *These values of physical quantities may be useful to you.*
- *Acceleration due to gravity, g* $= 10\ ms^{-2}$
- *Speed of sound in air* $= 340\ ms^{-1}$
- *Specific heat capacity of ice* $= 2{,}100\ Jkg^{-1}\ K^{-1}$
- *Specific latent heat of ice* $= 3.36 \times 10^{5}\ Jkg^{-1}$
- *Specific heat capacity of water* $= 4.2 \times 10^{3}\ Jkg^{-1}\ K^{-1}$

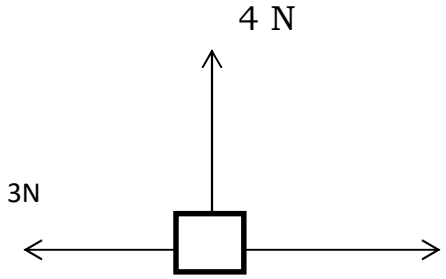
1. a) Define the following terms. (02 marks)
   i) Velocity
   ii) Displacement
   b) State Newton's laws of motion. *03 marks)*
   c) A car starts moving from rest and accelerates uniformly to a velocity of $20ms^{-1}$ in 10 seconds and finally comes to rest in 5 seconds.
   i) Draw a velocity –time graph to show the motion of the car. (*02 marks)*
   ii) Calculate the total distance covered by the car. *(03 marks)*

   d) (i) State the law of floatation. *(01 mark)*

   ii) Describe an experiment to verify the law of floatation. *(04 marks)*

   iii) State one application of the law of floatation. *(01 mark)*
2. a) Define moment of a force. (*01 mark)*
   ii) State two conditions for a body to be in equilibrium. *(02 marks)*
   b) Describe an experiment to determine the centre of gravity of an irregular laminar. *(04 marks)*
   c) i) Define a force

ii) A body of mass 10kg is acted upon by the forces as shown below.



Find the acceleration of the body. (*05 marks)*

d) State three differences between mass and weight. (*03 marks)*

3. a) State the basic law of electrostatics. *(01 mark)*
   b) With aid of a diagram describe how an electroscope can be charged positively by induction method. *(05 marks)*
   c) State any two uses of the gold leaf electroscope. *(02 marks)*
   d*)* A positively charged rod brought near the cap of neutral gold leaf electroscope; state and explain what is observed. *(03 marks)*
   e(i) What is meant by electric field.
   ii) Explain how a lightening conductor safe guards a building. *(05 marks)*
4. a) Define the following terms as applied to waves;
   i) amplitude ii) Wavelength iii) period *(03 marks)*

   b) Distinguish between a transverse wave and a longitudinal wave and give one example of each.

   c) The distance between 11 successive crests of a wave is 33m. Find the speed of the waves if the time taken to make one complete cycle is 0.01 seconds. *(04 marks)*

   d) Describe an experiment to show that sound cannot travel through a vacuum.

   (04 marks)

   e) State any two applications of ultra-sonic sounds. *(02 marks)*

5. a) Define the term radioactivity. *(01 marks)*
   ii) State two properties of beta particles. *(02 marks)*
   b(i) What are x-rays. (*01 mark)*
   ii) Describe how x-rays are produced in x –ray tube.

c) The following figures were obtained from the reading of a rate meter for alpha particle emission from a certain radioactive substance.

Count rate	800	500	350	200	80	20
Time	0	1.0	1.8	3.0	5.0	7.5

i) Plot a graph of count rate against time. *(04 marks)*

ii) Use the graph to find the half-life of the element. *(01 mark)*

d(i) State any two uses of x-rays. *(02 marks)*

ii) Give two precautions taken when dealing with radioactive substances. *(02 marks)*

6. ai)What is meant by the term light? *(01 mark)*

ii) Describe an experiment to demonstrate that light travels in straight line. *(04 marks)*

b) Differentiate between primary colours and secondary colours and state examples of each. (*04 marks*)

c) An object 2cm high is placed 5cm from the optical centre of the convex lens of focal length 10cm. by accurate scale drawing, determine the position and the size of the final image. (*05 marks)*

e) State two uses of a concave mirror. (*02 marks)*

7. a) Define the term below as used in magnetization (*02 marks)*

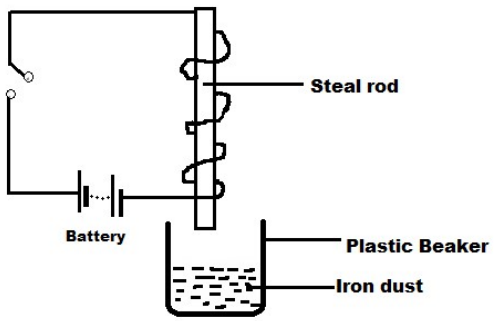
i) magnetic field

ii) neutral point

b) Describe the single touch method of magnetization. (*04 marks*)

c(i) State twodifference between iron and steel's magnetic properties. *(02marks*)

c(ii) The set up below is used to study magnetic properties of steel.



a) State what was observed when the switch is closed, and then opened after some time, hence explain the observations made. (05 marks)

b) (i) A millimeter of resistance 20.0Ω is used to measure a current of 2A. If its full scale deplication is 15mA, calculate its resistance of a resistor needed for the system to measure a current of 2A. (03 marks)

8. Define the term below; (02 marks)

i) specific heat capacity

b) A copper solid mass 200g at a temperature of 90^0C is placed in water at a temperature of 45^0C in a copper calorimeter of mass 50g. If the specific heat capacity of copper and water is $400Jkg^{-1}k^{-1}$ respectively. Find the mass of water in the calorimeter. (04 marks)

c) (i) Define the term 'convection' as used in heat transfer. (01 mark)

ii) List two applications of convection. (02 marks

iii) Describe a simple experiment to show that water is a poor conductor of heat. (04 marks)

c) i) State Boyle's law. (01 mark)

ii) A gas of volume $200cm^3$ exerts a pressure of $1.0x10^5$ Pascal's, when the volume changed to $350cm^3$ at constant temperature, find the new pressure exerted.

END