

KIIRA COLLEGE BUTIKI

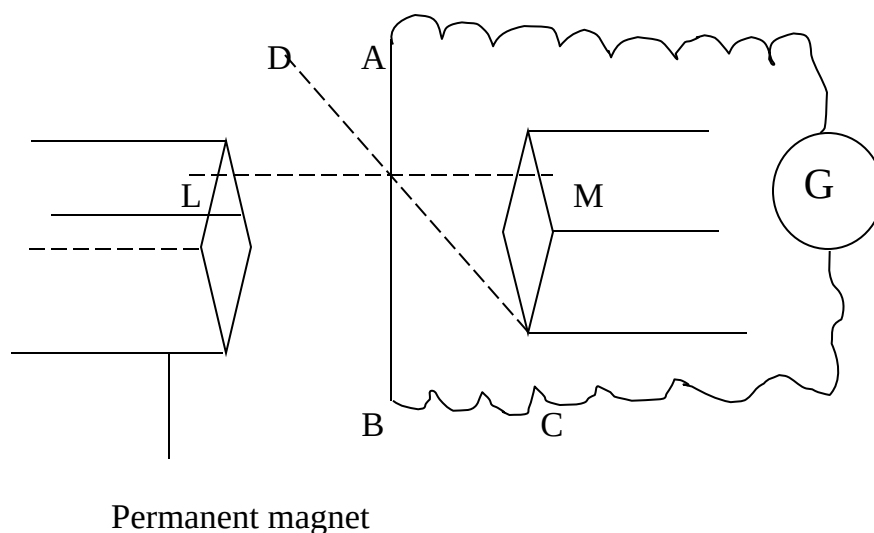
Uganda Certificate of Education

PHYSICS

Paper 2

Acceleration due to gravity	$= 10\text{ms}^{-2}$
Specific heat capacity of water	$= 4200\text{Jkg}^{-1}\text{K}^{-1}$
Specific latent heat of vaporisation of water	$= 2.2 \times 10^6\text{Jkg}^{-1}$
Speed of light in air	$= 3.0 \times 10^8\text{ms}^{-1}$

- 2). (a) Define the following terms:
- Hard magnetic material, (1 mark)
 - Soft magnetic material. (1 mark)
- (b) (i) Describe the electrical method of magnetizing a steel bar. (3 marks)
- (ii) State any two ways of demagnetizing a bar magnet. (2 marks)
- (c) Sketch the magnetic field pattern around a bar magnet with its south pole pointing north in the earth's magnetic field and use it to define a neutral point in a magnetic field. (3 marks)
- (d) A stiff wire AB is held between opposite poles of two bar magnets and is connected to a center zero galvanometer, G, as shown in figure 2 below.

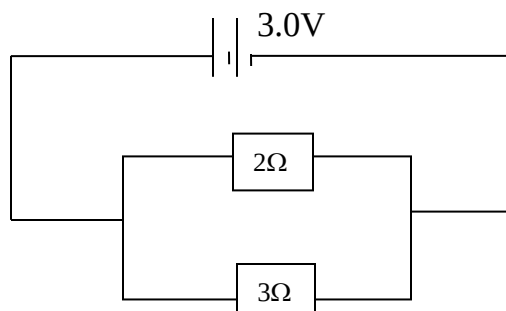


The wire AB is kept vertical and moved horizontally along line CD

- Explain what is observed as the wire AB moves to and fro along CD (4 marks)

- ii. Explain what would be observed if the wire moved along LM (2 marks)
- 3) (a) (i) What is meant by focal length of a lens? (1 mark)
- (ii) calculate the power of a lens of focal length 20 cm. (2 marks)
- (b) An object of height 7.5 cm is placed at a distance of 15 cm from a convex lens of focal length 20cm.
- By graphical construction , determine the;
- i. Height of the image.
- ii. Image distance
- iii. Linear magnification (6 marks)
- (c) Describe an experiment to determine the focal length of a convex lens using an illuminated object and a plane mirror. (5 marks)
- (d) Outline the main differences between the operation of a lens camera and that of the human eye. (2 marks)
- 4) (a) (i) Define an echo. (1 mark)
- (ii) State the conditions required for a stationary wave to be formed. (2 marks)
- (b) List the factors on which the frequency of a wave on a vibrating string depends. (3 marks)
- (c) Describe an experiment to demonstrate resonance in a closed pipe. (5 marks)
- (d) A student stood between two cliffs and made a loud sound. If the student heard the first echo after 1.5s and the second echo after 2.0s, find the distance between the cliffs.
- (speed of sound in air = 320 ms^{-1}) (5 marks)
- 5) (a). sketch graphs of current against voltage for the following devices:
- i. Ohmic conductor. (1 mark)
- ii. Semi conductor. (1 mark)
- (b) Explain the differences between a voltmeter and an ammeter in terms of their;
- (i) Construction (2 marks)
- (ii) use. (2 marks)
- (c) State three physical properties that effect the resistance of a solid conductor. (3 marks)

(d)



Two cells each of 1.5v and negligible internal resistance are connected in series across two resistors of 2 ohms and 3 ohms as shown in the figure 3 above. Calculate;

- i. The current supplied by the two cells. (4 marks)
 - ii. The power dissipated in the 3 ohm resistor. (3 marks)
- 6)
- (a) Describe a simple model of the atom. (4 marks)
 - (b) Define the following terms ;
 - i. Atomic number. (1 mark)
 - ii. Isotopes of an element (1 mark)
 - (c) state two differences between an alpha (α -) and a beta (β -) particle. (2 marks)
 - (d) (i) Distinguish between nuclear fusion and nuclear fission. (2 marks)
 - (ii) give an example of where each one occurs. (2 marks)
 - (e) The half life of a radioactive substance is 24 days. Calculate the mass of the substance which has decayed after 72 days if the original mass is 0.64g. (4 marks)
- 7)
- (a). What is meant by the following terms;
 - i. Thermionic emission? (1 mark)
 - ii. Photo electric emission? (1 mark)
 - iii. State the conditions necessary for photo electric effect to take place.(2 marks)
 - (b) With the aid of a well labeled diagram, explain how a cathode ray works.(6marks)
 - (c) Use diagrams to show what is observed on the screen of a cathode ray oscilloscope(CRO) when;
 - i. The CRO is switched on and no signal is applied to the X- and Y- plates (1 mark)
 - ii. The CRO is switched on and the time base is on but no signal across the Y- plates. (1 mark)
 - iii. The CRO is switched on with an alternating signal is applied to the Y- plates and the time base is on (1 mark)
 - (d) Give three uses of a CRO. (3 marks)
- 8)
- (a). (i) Define specific latent heat of fusion of a solid. (1 mark)

- (ii) Describe an experiment to determine the specific latent heat of fusion of ice, stating clearly any precautions taken. (8 marks)
- (b) Use the kinetic theory of matter to explain the occurrence of latent heat of fusion. (2 marks)
- (c) An ice making machine removes heat from water at a rate of 20 Js^{-1} . How long will it take to convert 0.5kg of water at 20°C to ice at 0°C (5 marks)