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PHYSICS

PAPER 2

July / August 2016

2¼ hours

KALUSSA JOINT MOCK EXAMINATIONS
Uganda Certificate of Education
PHYSICS
Paper 2
2 hours 15 minutes

INSTRUCTIONS TO CANDIDATES.

Answer **five** *questions.*

Mathematical tables and silent non-programmable calculators may be used.

These values of physical quantities may be useful to you.

Acceleration due to gravity $\quad = \quad 10ms^{-2}$

Speed of sound in air $\quad = \quad 320ms^{-1}$

1. a) Differentiate between conduction and convection. (02marks)

   b) Describe an experiment which can be performed to show convection currents in a liquid. (04marks)

   c) i) Draw a well labeled diagram of a vacuum flask. (03marks)

   ii) Explain how a vacuum flask minimizes heat losses. (04marks)

   d) Explain why it is not advisable to wear black clothes during extremely very cold weather. (03marks)

2. a) State the three Newton's Laws of motion. (03marks)

   b) Explain why a passenger seated in a moving taxi jerks forward and then backwards when the driver breaks suddenly. (04marks)

   c) Briefly describe an experiment to locate the centre of gravity of a regularly shaped card board. (04marks)

   d) A 5tonne truck initially moving with a velocity $40ms^{-1}$ accelerates to $80ms^{-1}$ in 5 seconds. Calculate the force on the truck that caused the velocity change. (05mrks)

3. a) Define the following terms.

   i)   Uniform Velocity
   ii)   Uniform acceleration (02marks)

   b) The table below shows the variation of velocity with time for a body which has been thrown vertically upwards from the surface of a planet.

Velocity (ms^{-1})	8	6	4	2	0	$^-2$	$^-4$	$^-6$
Time (s)	0	1	2	3	4	5	6	7

   i)   What does the negative velocity mean? (02marks)

   ii)   Plot a graph of velocity against time. (03marks)

   iii)   Use the graph to find acceleration due to the gravity on the planet. (03marks)

   iv)   Use the graph to find the total distance travelled. (03marks)

4. a) What is meant by the following terms?

i) Critical angle (02marks)

ii) Total internal reflection. (03marks)

b) Explain briefly how Sky Radio waves travel from a transmitting station to a receiver. (04marks)

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c) State three applications of converging lenses. (03marks)

d) Explain why the sun appears red at sunset and sunrise. (05marks)

5. a) What is meant by the following;-

   i) thermionic emission (01mark)

   ii) photo-electric effect (02marks)

   b) with reference to the cathode ray oscilloscope (C.R.O) describe;-

   i) the function of the time base. (02marks)

   ii) how the brightness is regulated. (02marks)

   c) i) Why is a cathode ray oscilloscope evacuated? (02marks)

   ii) Give any two uses of a cathode ray oscilloscope (C.R.O) (02marks)

   d) Explain briefly the principles of operation of a C.R.O (05marks)

6. a) Describe the structure and action of a fluorescent tube. (06marks)

   b) Give one advantage of a fluorescent tube over a filament lamp. (01mark)

   c) Describe the function of;-

   i) Fuse (01mark)
   ii) an earth wire (01mark)

   d) Describe briefly how power is transmitted from a power station to a home.

   (04marks)

   e) Find the cost of running two 60W lamps for 48hours if the cost of

   each unit is shs.80. (03marks)

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

    i)   Wave length   (01mark)

    ii)   Frequency   (01mark)

    iii)   Period   (01mark)

b) i) State the conditions necessary for stationary waves to be formed. (02marks)

   ii) Give three main characteristics of stationary waves.   (03marks)

c) i) Describe an experiment to determine the speed of sound in air.   (04marks)

   ii) Mention any two likely sources of error in the experiment c(i) above.

                                              (02marks)

d) Explain why the speed of sound is higher in solids than in air.   (02marks)

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8. a) Define the following as applied to spherical mirrors.

    i)   Principal focus   (02marks)

    ii)   Focal length   (01mark)

b) i) State the laws of reflection of light.   (02marks)

   ii) Mention any two properties of an image formed by a plane mirror.(02marks)

c) An object is placed 20cm in front of a convex mirror of focal length 12cm. find;-

    i)   The position of the image formed.   (05marks)

    ii)   Describe the nature of the image formed .   (02marks)

    iii)   Calculate the magnification of the mirror.   (02marks)