

**535/2
PHYSICIS
PAPER 2
JULY - AUGUST 2017
2 ¼ HOURS**



**KAYUNGA SECONDARY SCHOOLS HEAD TEACHERS AND PRINCIPALS
ASSOCIATION (KASSHPA)
JOINT MOCK EXAMS 2017
PHYSICS
PAPER TWO
2 ¼ HOURS**

INSTRUCTIONS TO CANDIDATES

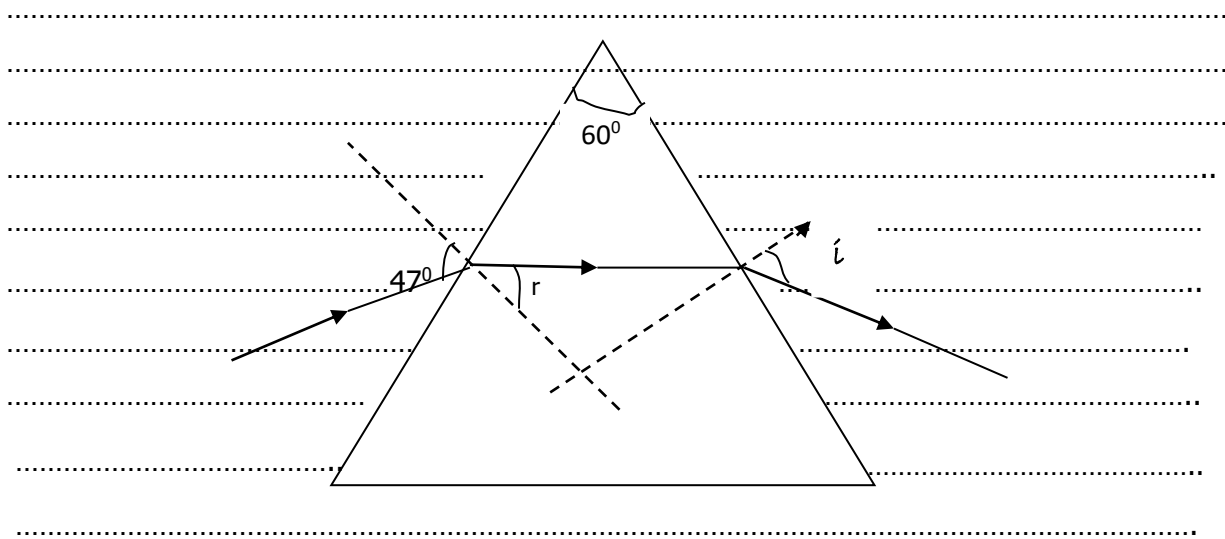
- Attempt any **five** questions
- Any additional question(s) answered will not be marked

Assume where necessary;

- Acceleration due to gravity = 10ms^{-2}
- Density of water = 1000kgm^{-3}
- Speed of electromagnetic waves = $3.0 \times 10^8\text{ms}^{-1}$
- Specific heat capacity of water = $4200\text{Jkg}^{-1}\text{k}^{-1}$

- 1.(a) Define momentum (1 mark)
- (b) A moving ball, A of mass 0.100kg collides with a stationary ball, B of mass 0.200kg. After collision, A moves back wards with a velocity of 2ms^{-1} while B moves forward with a velocity of 5ms^{-1} . Calculate the;
- (i) initial velocity of A, (3 marks)
- (ii) force exerted by A and B if the collision took 0.05 seconds. (3 marks)
- (c) State Newton's laws of motion. (3 marks)
- (d) Explain why a long jumper should normally land on sand. (3 marks)
- (e) Explain what happens when a balloon is filled with air and then released in space without tying its open end. (3 marks)
2. (a) State;
- (i) Archimede's principle (1 mark)
- (ii) the law of flotation (1 mark)
- (b) A block of wood of volume 300cm^3 floats on water with $\frac{3}{4}$ of its volume immersed. Find the;
- (i) mass of the wooden block (3 marks)
- (ii) fraction of the block that sinks when it is placed in oil of density 0.842gcm^{-3} . (3 marks)
- (c) A small steel ball is allowed to fall centrally down a tall cylinder containing lubricating oil.
- (i) Sketch a velocity – time graph for the motion of the ball. (1 mark)
- (ii) Describe the features of the graph. (3 marks)
- (d) Describe an experiment to demonstrate the existence of surface tension. (4 marks)

- 3.(a) State the laws of reflection of light (2 marks)
- (b) Describe an experiment to demonstrate the principle of reversibility of light. (4 marks)
- (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? (3 marks)
- (d) The diagram below shows a ray of light incident at an angle of 47° on one surface of an equilateral triangular prism immersed in a liquid of refractive index 1.33.



Given that the refractive index of glass is 1.5, Calculate the;

- (i) angle of refraction, r (2 marks)
- (ii) emergent angle, i (2 marks)
- (e) (i) What is meant by focal length of a lens? (1 mark)
- (ii) Calculate the power of a concave lens of focal length 20cm. (2 marks)

4.(a) Define the following terms

- (i) atomic number (1 mark)
- (ii) isotopes of an element (1 mark)

- (b) (i) What is half life of a radioactive material (1 mark)
- (ii) A radioactive material has a half life of 10 years. If after 30 years, 250g of it is remaining, determine the initial mass of the material. (4 marks)

- (c) What are x – rays? (1 mark)
- (d) Explain briefly how each of the following can be increased in an x – ray tube;
 - (i) intensity of x – rays. (3 marks)
 - (ii) penetrating power of x – rays. (3 marks)

- 5.(a) Define the following terms.
 - (i) amplitude (1 mark)
 - (ii) wave length (1 mark)

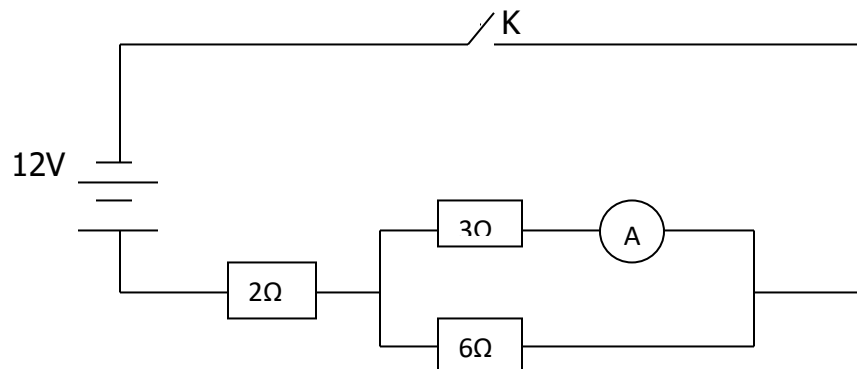
- (b) The distance between two successive antinodes on a stationary wave is 4.0cm. If the distance between the source of the wave and reflector is 32.0cm, find the;
 - (i) number of loops (3 marks)
 - (ii) wave length of the wave. (2 marks)
- (c) (i) Use a labeled diagram to show the bands of an electromagnetic spectrum. (3 marks)
- (ii) Calculate the frequency of a radio wave of wavelength 2m (3 marks)
- (d) State three differences between light waves and sound waves. (3 marks)

- 6.(a) State the law of electrostatics (1 mark)
- (b) Explain briefly how a conductor can be charged negatively by induction. (5 marks)

- (c) Describe how a gold leaf electroscope can be used to determine the sign of charge on a given charged body. (5 marks)
- (d) Explain how leakage of charge occurs at the ends of sharp conductors. (5 marks)

- 7.(a) Define the terms e.m.f and internal resistance of a cell. (2 marks)
- (b) With the aid of a circuit diagram describe how you can determine the internal resistance of a cell. (5 marks)

(c) A battery of e.m.f 12V and negligible internal resistance is connected to resistances 2Ω , 3Ω and 6Ω as shown in the figure below.



Find the reading of the ammeter, A when K is closed. (6 marks)

- (d) A house has one 100W bulb, two 75 W bulbs and five 40W bulbs. Find the cost of having all these bulbs switched on for 2 hours every day for 30 days at a cost of 600 shillings per unit. (3 marks)

- 8.(a) (i) Define the term conduction. (1 mark)
- (ii) Describe with the aid of a diagram an experiment to show that water is a poor conductor of heat. (4 marks)
- (b) (i) Define specific heat capacity. (1 mark)

- (ii) The same quantity of heat was supplied to 5kg of sea water and 12kg of alcohol. The temperature rise was 3°C and 2°C respectively. Find the ratio of the specific heat capacity of sea water to that of alcohol. (4 marks)
- (c) Explain why a bare cement floor feels colder than carpeted one. (2 marks)
- (d) Describe with the aid of a labeled diagram an experiment to show the effect of increase in pressure on the melting point of ice. (4 marks)

END