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232/2FORM FOUR PHYSICS PAPER 2 SEPTEMBER, 2017 2 HOURS

# **KIKUYU SUB-COUNTY KCSE TRIAL EXAMINATION** stPapers.com

#### **SEPTEMBER 2017**

## **INSTRUCTIONS TO CANDIDATES**

- Write your name and index number in the space
- Attempt all questions in all spaces provided.
- $\bullet$  Sign and write the date of the examination in the spaces provided
- ✤ Mathematical tables and electronic calculators may be used.

### For Examiner's Use Only

Section	Question	Maximum Score	Candidates' Score
А	Q1 - Q12	25	
В	Q13	8	
40	Q14	10	
	Q15	12	
	Q16	10	
	Q17	13	
	Q18	12	
		80	

#### **SECTION A (25 MARKS)**

1 .Given that the speed of light in air is  $3.0 \times 10^8$  m/s, calculate the speed of light in a crown glass of refractive index 1.6 (3 mks)

- 2. A point source produces 10 waves per second in a ripple tank. If the waves are 6cm apart, find the velocity of the waves. (2 mks)
- 3. An electric kettle is rated 2.5KW and uses a 240v supply. If electricity costs Ksh 2.30 per unit, calculate the cost of running it for a week when used 2 hours each day. (3 mks)
  4. A --
- 4. A man standing between two parallet walls fires a gun. He hears the echo after 1.5 seconds and another one after 2.5 seconds. Find the distance between the walls given that speed of sound is 340m/s. (2 mks)
- 5. Name a device used to change light energy directly into electrical energy. (1 mk)

6. The half-life of a certain radioactive substance is 57 days. Explain the meaning of this statement. (1 mk)

- Florescent Cathode x-plates screen vacuum y-plates В Beam treekcsepe i) Name the parts labeled A and B. (2mks) ii) Explain how the electrons are produced in tube (2mks) Hee Past papers 8. State one difference between hard X-rays and soft X-rays. (1mk)
- 7. The figure below shows the features of a cathode ray tube.

9. A nucleus of an element X of atomic mass 238 and atomic number 92 decays by emitting 8 alpha particles and 10 beta particles and finally forms a nucleus of an element y. Write the equation of the reaction. (3mks)

10. The diagram below shows a rectifier circuit for an alternating current (a.c) input.



Draw the traces of the signal obtained on CRO connected across PR and across QS. (4 mks)

11. State the difference between X-rays and gamma rays in the way in which they are produced

12. A generator produces a peak voltage 520v. What is the root mean square value of this voltage?. (1mk)

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SECTION B (55 MARKS)

(3 mks)

13. a) State three factors affecting the capacitance of a parallel plate capacitor

b) You are provided with:

Uncharged capacitor Variable resistor Voltmeter Milliammeter

tree past

*6v battery* 

(i). Using the above apparatus, draw a circuit diagram that can be used to study the charging of a capacitor. (3 mks)

ii) On the axis provided, sketch a current - time graph for the charging process. (2 mks) istpapers.cor

14.a) State Len's law of electromagnetic induction.

isit. www.freekcsepat b) Figure 13 shows a simple microphone in which sound waves from the person talking cause the cardboard diaphragm to vibrate. 0

(1mk)



- i) Explain how a varying current is induced in the cell when the diaphragm vibrates. (2mks)
  - ii) State two ways in which the induced current (i) above can be increased. (2mks)

- c) A transformer with 1200 turns in the primary circuit and 120 turns in the secondary circuit; it produces heat at the rate of 600w. Assuming 100% efficiency, determine the: Voltage in the secondary circuit. (2mks) i) ii) Current in the primary circuit. (2mks) (1mark) iii) The current in the secondary circuit. pers.com 15. (a) The graph in figure 8 shows the variation of photoelectric current with applied voltage when a surface was illuminated with light of a certain frequency. Figure 8 free (I). On the same axes, sketch the graph of when light of higher intensity but same frequency is used to illuminate the surface. (1 mk) (1 mk)
  - (II). Explain your answer in 15(I) above .
- (b). ( I) Explain the term "work function"

(1 mk)

- (II) The threshold frequency for potassium is  $5.37 \times 10^{14}$  HZ. When the surface of potassium is illuminated by another radiation, photoelectrons are emitted with a speed of  $7.9 \times 10^5$  m/s. Given that  $e = 1.6 \times 10^{-19}$ C and  $h = 6.63 \times 10^{-19}$ C and  $Me = 9 \times 10^{-31}$ kg. Calculate:
  - i) The work function for potassium. (3 mk)
  - ii) The k.e of the photoelectrons. (3 mk)

iii) The frequency of the second source.

16. a) Figures 11 (a) and (b) show diagrams of the human eye.



- i) Sketch in figure 11(a) a ray diagram to show short sightedness. (1mk)
- ii) Sketch in figure 11(b) a ray diagram to show how a lens can be used to correct the shortsightedness. (2mks)

b) Figure 12 shows the features of a simple camera.



c) A lens forms clear image on a screen when the distance between the screen and the object is 80cm. If the image is 3 times the height of the object, determine the distance of the image from the lens. (3mks)

17. a) State Ohm's law.

(1 mk)

- b) Describe with aid of a diagram an experiment to verify Ohm's law (3 mk)
- Jov 1 c) Two resistors  $R_1$  and  $R_2$  are connected in series to a 10V battery. The current flowing then is 0.5A. When  $R_1$  only is connected to the battery the current flowing is 0.8A.Calculate the Past Papers visiti i) Value of R<sub>2</sub> (3 mk)

ii) Current flowing when  $R_1$  and  $R_2$  are connected in parallel with the same battery. (3 mk) κQ

d) Recharging is one of the practices of maintenance of accumulators. State two measurements, which need to be taken to help you decide when an accumulator is due for charging. (2 mk)