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NAME…… INDEX NO……

SCHOOL…… CANDIDATES SIGNATURE……

DATE……

232/2

PHYSICS (THEORY)
PAPER 2
JULY/AUGUST 2014
TIME: 2 HOURS

KAMUKUNJI DISTRICT KCSE EVALUATION TEST - 2014

INSTRUCTIONS TO CANDIDATES

-This paper consists of **TWO** sections: **A** and **B.**
-Answer **ALL** the questions in sections A and **B** in the spaces provided.
-All working **MUST** be clearly shown.
-Electronic calculators and mathematical tables may be used

FOR EXAMINER'S USE ONLY

Section	Question	Maximum Score	Candidate's Score
A	! - 11	25	
	12		
	13		
B	14		
	15		
	TOTAL SCORE	80	

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SECTION A (25 MARKS)

1) State **one** difference between an image formed by a pinhole camera and the one viewed through a magnifying glass. (1mk)

2) Distinguish between longitudinal and transverse waves and give one example of each (3mks)

3) An electric immersion heater rated 240V, 3kW is to be connected to a 240V mains supply, using a 10A fuse. Showing your working, state whether the fuse is suitable or not. (3mks)

4) Complete the following table (2mks)

Radiation	Source	Detector	Application
Radio			Communication
	Hot body		Drying clothes

5) State one defect of a simple cell and explain how it can be minimized. (2mks)

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6) A wire of resistance 27 ohms is cut into three equal lengths. If the three wires are connected in parallel, what is the effective resistance? (2mks)

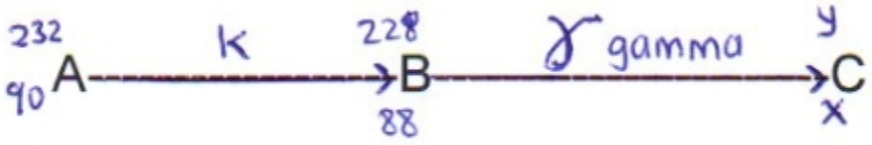
7) A ray of light makes an angle of 35^0 with the glass surface. Calculate the total distance the ray covers through a glass of refractive index 1.45, given that the width of the glass is 6cm (3mks)

8) State **one** application of each of the following. (2mks)

i) Convex mirror …….

ii) Parabolic reflector……...

9) Below is a nuclear reaction.



i) Identify radiation K (1mk)

ii) Determine the values of x and y

x……. (1mk)

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y…….. (1mk)

10) Explain briefly how a p-type semiconductor is made. (1mk)

11) Figure 1 represents a displacement – time graph for a wave.

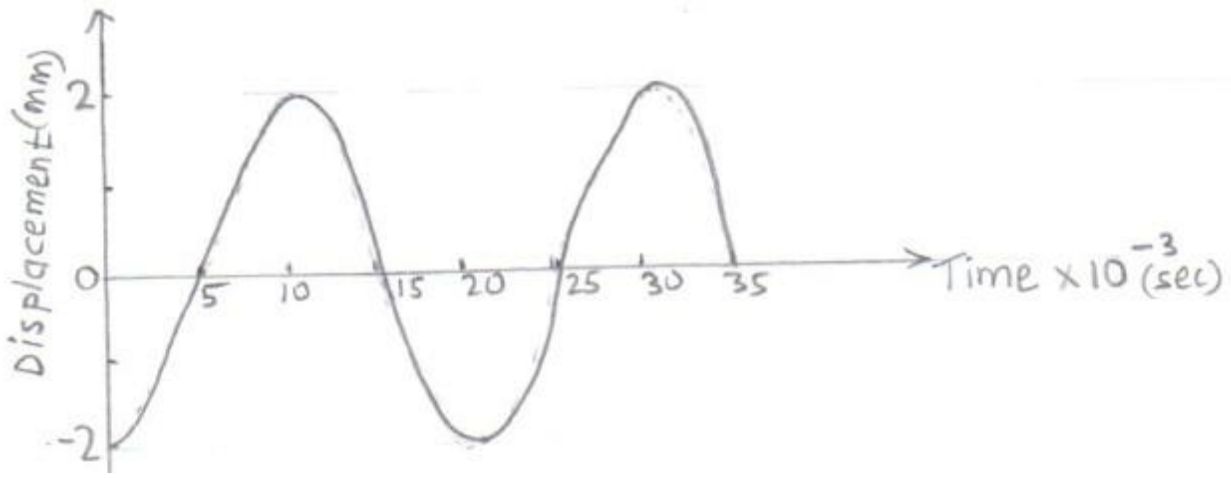

Figure 1

Determine the frequency of the wave. (3mks)

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SECTION B (55 MARKS)

12(a) The two free ends of a coil are connected to a center – zero galvanometer. When the north pole of magnet is moved towards the coil, the pointer deflects in the direction shown in figure 2.

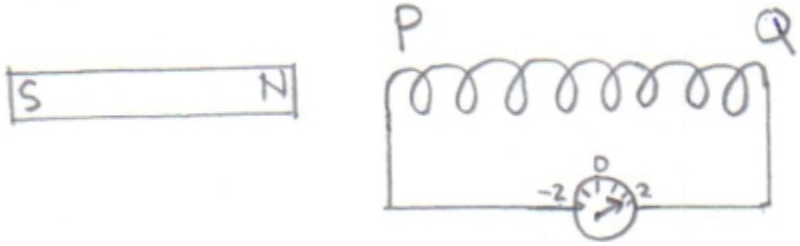

Figure 2

State with a reason the behavior of the pointer in the following cases:

i) The north pole of the magnet is held stationary near P. (2mks)

ii) The north pole of the magnet is made to approach the coil from end Q (2mks)

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b) State Faraday's law of electromagnetic induction. (1mk)

c) A transformer supplies 12V when it is connected to 240V supply of electricity. The output of the transformer is connected to 12V 36W bulb. The current drawn from the supply by the transformer is 0.5A. Calculate:

i) The input power of the transformer. (3mks)

ii) The current drawn fro the transformer. (3mks)

iii) The output power of the transformer (1mk)

iv)The efficiency of the transformer (3mks)

13) (a)Draw the electric field pattern in figure 3 (2mks)

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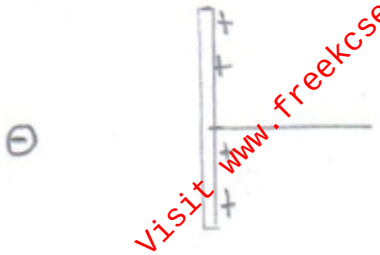

Figure 3

b) Figure 4 shows a system of capacitors connected to 100V supply.

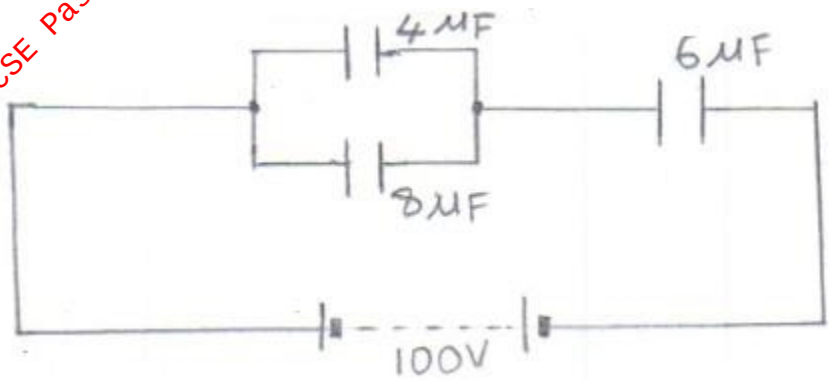

Figure 4

Determine:

i) The effective capacitance of the circuit. (3mks)

ii) the charge through the 6 μF capacitor. (3mks)

iii) The p.d. across the 8 μF capacitor. (4mks)

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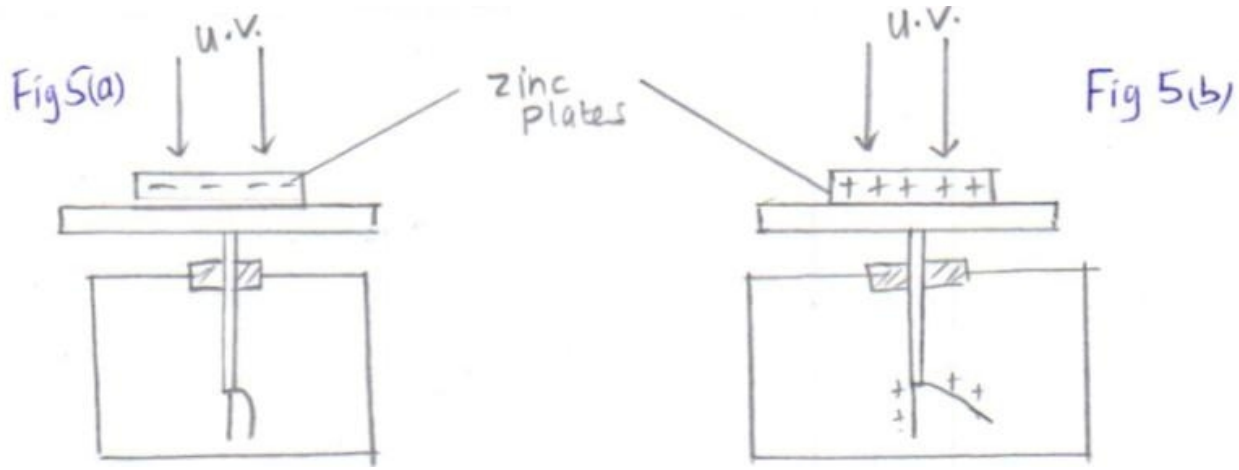
c) State **two** factors that affect the capacitance of a parallel plate capacitor. (2mks)

14)(a) Figures 5(a) and 5(b) shows ultra violet radiation striking polished zinc plates placed on negatively and positively charged gold leaf electroscopes respectively.



Explain why the leaf collapses in fig 5(a) but does not collapse in fig 5(b) (4mks)

b) i) State **two** factors which determine the speed of photoelectrons emitted by a metal surface. (2mks)

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ii) In an experiment using a photocell, u. v. light of varying frequency but constant intensity was made to strike a metal surface. The maximum kinetic energy (K. $E._{max}$) of photoelectrons for each frequency, f, was measured. The graph in figure 6 shows how K .$E._{max}$ varies with f.

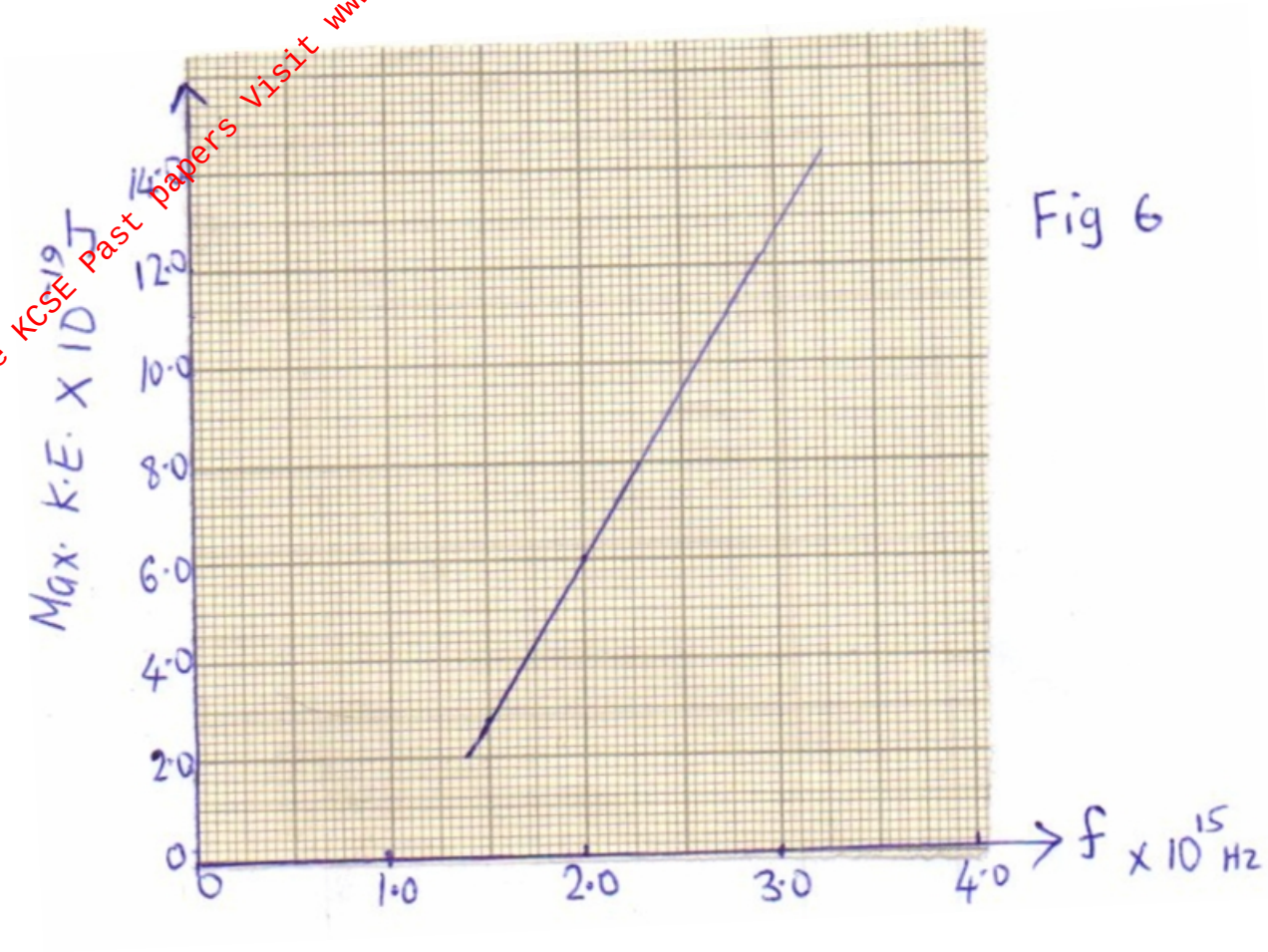

Fig 6

Given that K. E_{max}=hf - , determine the values of the constants h and from the graph (6mks)

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c) Light of frequency 5.5 x 10^{14} Hz is made to strike a surface whose work function is 2.5eV. Show that photoelectric effect will not take place. (Use the values of h from (b) above. (Take e=1.6 x 10^{-19}C) (3mks)

15) (a) You are provided with a 12V a.c. source , four diodes and a resistor .

i) Draw a circuit diagram for full wave rectifier and show the points at which the output is taken (5mks)

ii) Sketch a graph of voltage against time before rectification. (1mk)

iii) Sketch a voltage – time graph after rectification. (1mk)

iv) Sketch a voltage –time graph after rectification with a capacitor connected across the resistor in (i) (1mk)

b) A radioactive sample of half life 130 days initially has 1.0×10^{20} radioactive atoms. Determine the number of radioactive atoms that would have decayed after 390 days. (3mks)

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