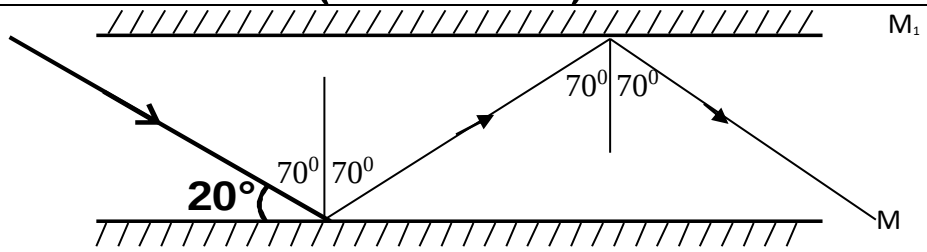
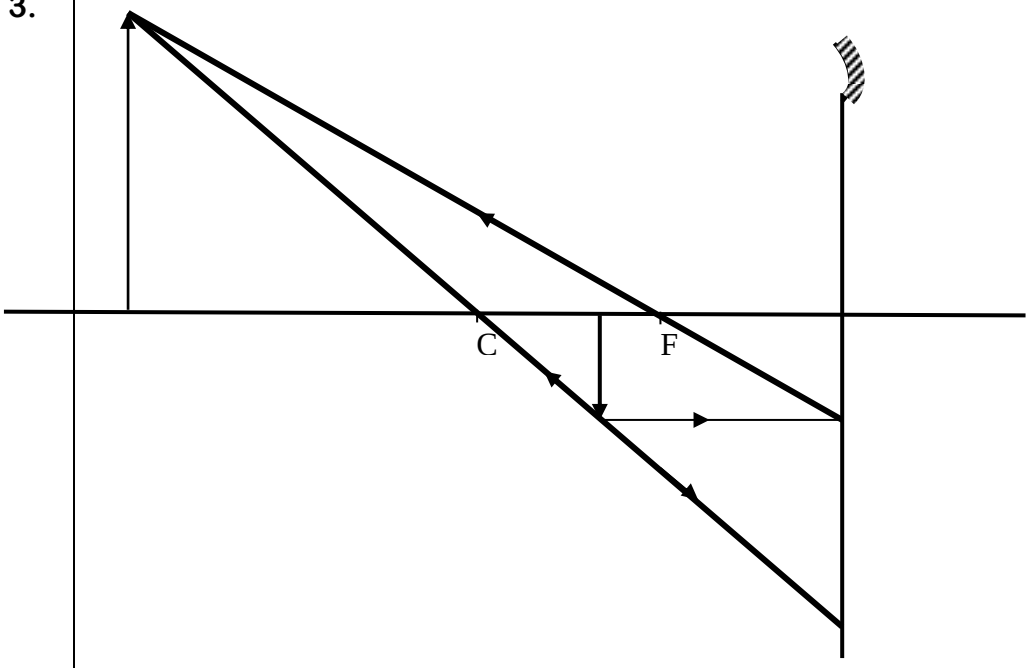
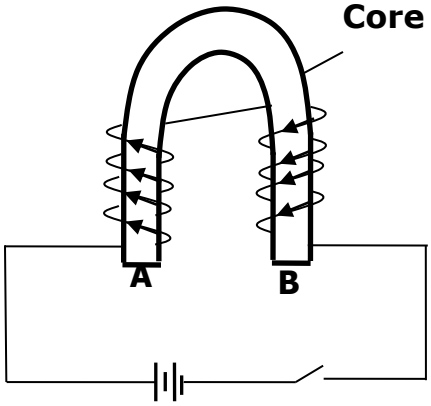
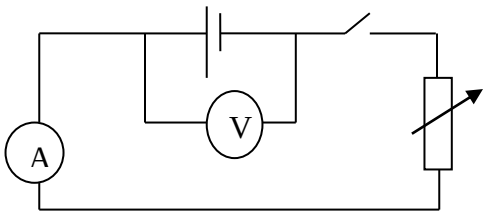
PHYSICS PAPER 232/2
FORM FOUR
MARKING SCHEME

	SECTION A (25 marks)		
1.		1 1	CORRECT RAYS Correct angles
2	The ends of the pin <u>acquire the same polarity</u> thus they <u>repel each other.</u>	1 1	
3.		2	Correct rays @ 1mk Position and nature of image (real, upright,magnified)
4.	The sound becomes faint/ magnitude of sound reduces On cooling the partial vacuum is created which minimizes the transmission of sound which requires a medium.	1 1	
5.	**Radio waves , Microwaves, Infrared, X-rays,Red light.**	1	

1

6.		1	Tied Both must be correct.
7.	i. Positive ii. Electrons flow to the sphere from the ground	1 1	
8.	a) 1.52V b) 	1 1 1	Must extrapolate. If not deny. Correct symbols Correct arrangement (both marks tied)
9.	V =fλ = 8 x 0.04 =0.32m/s	1 1 1	Formula Substitution Answer
10.	i. To increase the length of the conductor hence increasing the resistance. ii. High melting point	1 1	
11.	$cost = \frac{1500}{1000} \times \frac{30}{60} \times 6.70$ = Ksh. 5.025	1 1	Evaluation Answer (check units)
12.		1	Correct magnetic

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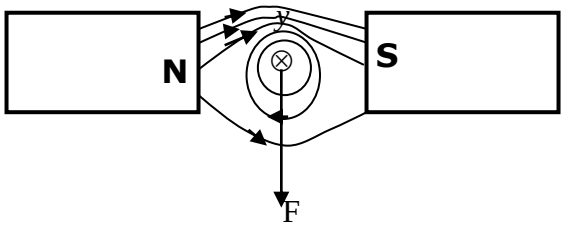
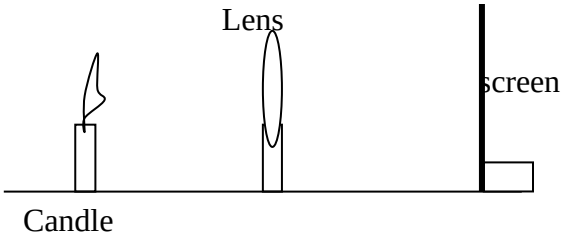
			field pattern 1 Direction of the force
	SECTION B (55 marks)		
13.	**a)** **i. The angle of incidence is equal to the critical angle of the transparent medium.**	**1**	
	ii. $\eta = \frac{1}{\sin C}$	**1**	**Formula**
	$\eta = \frac{1}{\sin 50}$	**1**	**Substitution**
	= 1.305	**1**	**Answer**
	b) v= -10cm **f = -15cm**		
	$\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$	**1**	**Formula**
	$\frac{1}{-15} = \frac{1}{u} + \frac{1}{-10}$	**1**	**Substitution**
	$\frac{1}{u} = \frac{1}{-15} - \frac{1}{-10} = \frac{-2+3}{30}$		
	U = 30cm	**1**	**Answer**
	c) 	**1**	**Diagram**
	• **The lens is placed between the lit candle and the screen.** • **Adjust the position of the lens until a sharp focused image is formed on the screen.** • **Record the object and image distance u and v.**	**1**	

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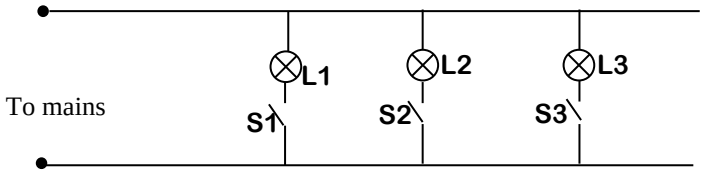
	• **Use the les formula to determine the focal length f** $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$	**1**	
		10	
14.	**a)** **i. Remains constant.** **ii. The leaf divergence increases.** **There is increase in potential difference between the plates.** **Since there is decrease in capacitance (but the amount of charge remains constant and capacitance is given by C = Q/V)** **b)** **i.** $C_T = \frac{7\times1}{7+1}$ **= 0.875μF or 8.75 x 10^{-7}F** **ii. Q= CV** **= 8.75 x 10^{-7} x 12** **= 1.05 x 10^{-5} C** $V_{3\mu F} = 12 - \frac{1.05\times10^{-5}}{1\times10^{-6}}$ **=12 – 10.5** **= 1.5V**	**1** **1** **1** **1** **1** **1** **1** **1** **1**	
		09	
15.	**a)** **i. The bulbs cannot be operated independently.** **ii.** 	**1** **1**	

	b) **i. Galvanometer deflects momentarily in one direction when the conductor moves upwards.** **The galvanometer deflects momentarily in the opposite direction when the conductor moves downwards.** **ii.** • **Using stronger magnets** • **Increasing rate of movement of the conductor/ moving conductor faster.** **c)** • **Primary coil** • **Since <u>more current flows through the primary coils</u> they need to be thicker to <u>minimize</u> <u>resistance</u>.**	**1** **1** **2** **1** **1**	
		08	
16.	**a)** **i. The divergence of the leaf decreases/reduces.** **ii. No change on divergence of the leaf is observed.** **b)** $\frac{h}{e} = gradient$ $= \frac{1.6 - 0.2}{(7-3) \times 10^{14}}$ $= 3.5 \times 10^{-15}$ **h =3.5 x 10^{-15} x 1.6 x10^{-19}** **h = 5.6 x 10^{-34}Js** **c)** **i. P <u>steps up the voltage</u> used to <u>accelerate</u> the <u>beam of electrons</u> towards the target.** **ii. Electrons hitting part C possess <u>high kinetic energy</u>/moves at very <u>high speed</u>.** **Most of its kinetic energy (about 99.5%) is converted to heat energy.**	**1** **1** **1** **1** **1** **1** **1** **1**	

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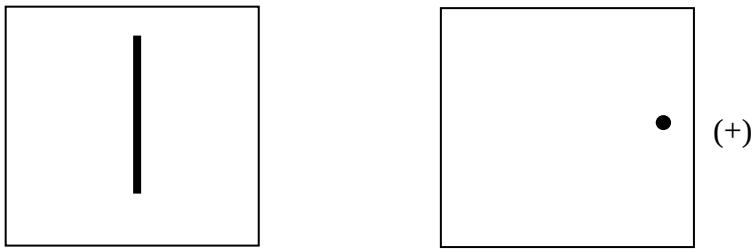
	iii. By increasing the accelerating voltage/potential difference between the cathode and anode.	**1**	
		09	
17.	**a)** **i. To produce <u>two coherent sources</u> of light.** **ii. <u>Alternating bright and dark fringes</u> are observed.** **Bright fringes represent regions of constructive interference where the waves arrive in phase whereas the dark fringes represents regions of destructive interference where waves arrive out of phase.** **b)** $f = {}^{v}/_{\lambda}$ $= \frac{2}{1} = 2Hz$ **V =fλ** **=2 x 0.4** **=0.8m/s** **c)** $T = 4 \times \frac{10}{1000} = 0.04s$ **f = $^{1}/_{T}$** **= 1/0.04 = 25Hz**  (b) (c)	**1** **1** **1** **1** **1** **1** **1** **1** **1**	
		09	
8.	**a)** **i. Beta particles** **ii. 210 – 4 = 206**	**1** **1**	**Must show working**

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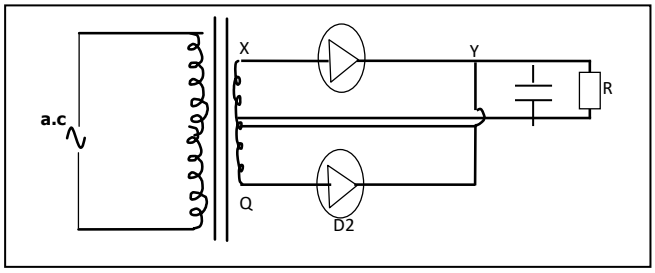
	b) $50 = 200 \times \left(\frac{1}{2}\right)^{\frac{T}{t_{\frac{1}{2}}}}$ $\frac{1}{4} = \left(\frac{1}{2}\right)^{\frac{12}{t_{\frac{1}{2}}}}$ $2 = \frac{12}{t_{\frac{1}{2}}}$ $t_{\frac{1}{2}} = 6\ minutes$	**1** **1**	**Look out for alternative method**
	c) **i.** **During the first half cycle, X is positive in respect to Q hence D1 is forward biased and D2 is reverse biased thus current flows through the load R using path XYRX.** **In the next half cycle when Q is positive in respect to X D2 is forward biased and D1 is reverse biased hence current flows through the load using the path QYRQ.** **In both cycles the current flows through the load resistor R in the same direction YR.** **ii.**  **iii.**	**1** **1** **1** **1**	**Capacitor across the load**

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	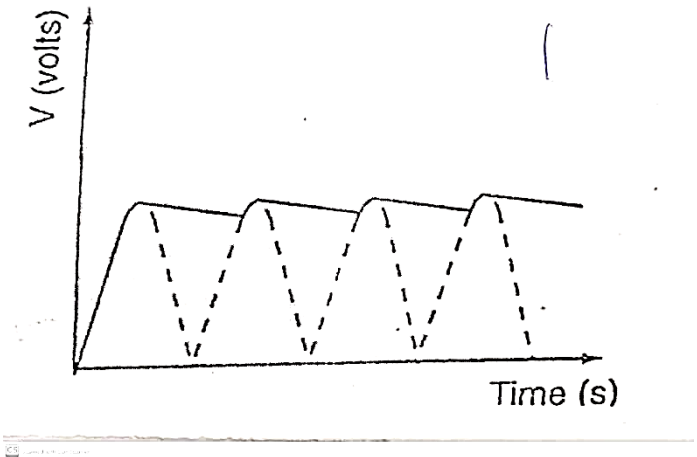		

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