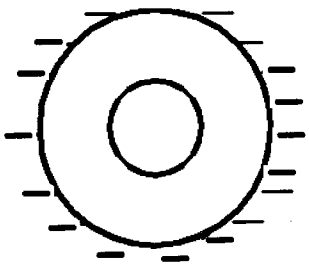
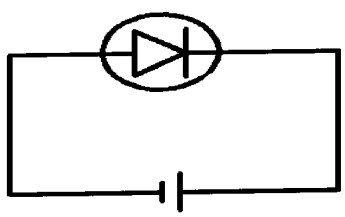
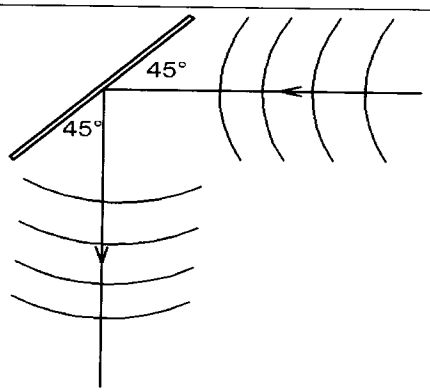
4.6.2 Physics Paper 2 (232/2)

SECTION A: (25 marks)

1.	The image size increases √/ is magnified	(1 mark)
2.	a) Gold leaf √ b) Protect the surrounding of the metal rod and leaf from damage or drought√	(1 mark) (1 mark)
3.	– The e.m.f. across it's terminals√ – The relative density of the acid √	(2 marks)
4.	From the relation $v = \lambda f$, the speed increases √ since the wavelength λ increases but the frequency is constant because source is the same√	(2 marks)
5.	$\eta = \frac{1}{\sin c}$ √ $= \frac{1}{\sin 42^o}$ √ $= \frac{1}{0.669}$ $= 1.495$ √	(3 marks)
6.	B√ The two cells in series provide√ a higher electromotive force/potential difference	(2 marks)
7.		(1 mark)
8.	There is greater√ magnetic force at the ends due to increased√ field lines at the ends of the bar magnet than at the center of the bar magnet	(2 marks)
9.		(2 marks)

10.	$f = \frac{3\times10^8}{\lambda}$ √ $= \frac{3\times10^8}{800}$ √ $= 0.00375\times10^8\ Hz$ $= 3.75\times10^5\ Hz$ √	(3 marks)
11.	– Electrons are produced by thermionic emission√ – The electrons are accelerated by a high voltage√ – Electrons are suddenly stopped to produce x- rays√	(2 marks)
12.	To disconnect the circuit when excess current flows. √	(1 mark)
13.	 √-curved correctly √-angle of reflection	(2 marks)
	SECTION B: 55 MARKS	
14.	(a) – Stepping up the voltage – Use of good conductor cables	(1mark)
	(b) The electric cooker has a power output of 2500W, and operates at a potential 250V, ie P=VI	(1 mark)
	(c) Total power = $1500+2500+500+(60\times3)$ $= 4680$ W√ Total current required = $\frac{4680}{240} = 19.5A$ √ Hence fuse blows and disconnects the current when it exceeds 10 A√ ie all appliances can't be connected at the same time. √	(4 marks)

(ii) $V = IR$ √

$I = \frac{p}{v}$

$= \frac{2500}{240}$

R= $240 \div \left(\frac{2500}{240}\right)$ √

$= \frac{240 \times 240}{2500}$

= 23.04Ω √

3 marks

15 a) – Using the mirror focus a distant object onto the screen

– Adjust the distance between the screen & the mirror to obtain a sharp image

– Measure the distance between the screen & the mirror – this is the focal length of the mirror

1 mark

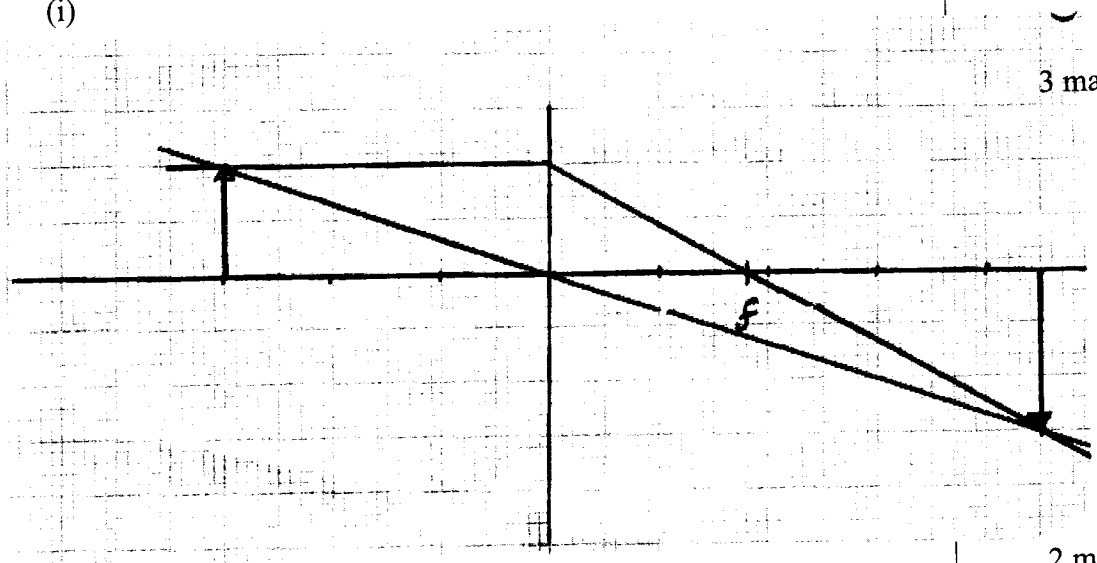
(3 marks)

(b) $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$ √ $\qquad \frac{1}{V} = \frac{4-5}{40}$ √

$\frac{1}{V} = \frac{1}{10} - \frac{1}{8}$ √ $\qquad v = -40$ √

(c)

(i)



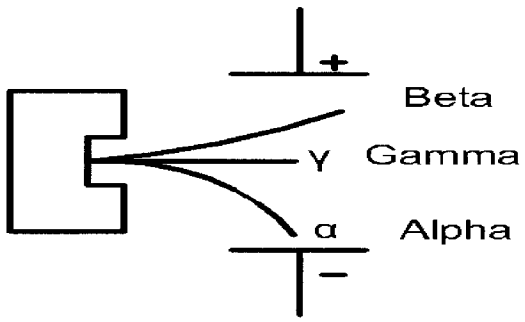
3 marks

(ii) I) image height = 15

II) image distance = 45 cm

2 marks

2 marks

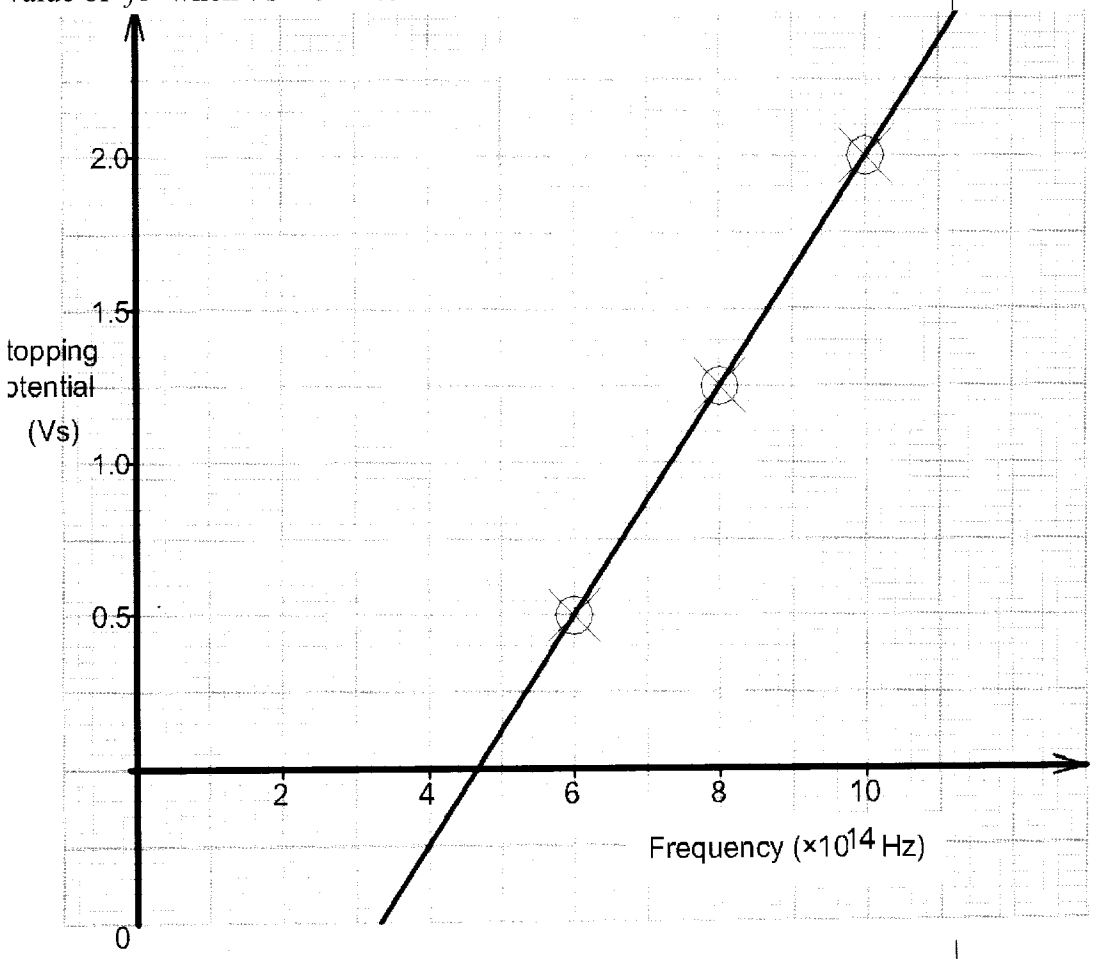
16	a) - Sterilization of surgical equipment√ - Treatment of malignant growths√	2 marks
	(b) $x = 4$ $y = 2$	2 marks
	(c) (i)  	3 marks
	(ii) (I) To shield the radiations from moving to the other directions ie direct them to one side√ (II) To remove air particles & reduce collisions for clear vision of the effect of the field√	1 mark 1 mark
	d (i) Gamma rays, X-rays, microwaves, radio waves (ii) $64 \xrightarrow[24\text{ day}]{} 32 \xrightarrow[48\text{ day}]{} 16 \xrightarrow[72]{} 8$ √ → 3 half lives → 8g left √	1 mark 2 marks
17	a) (i) - The heating coil√ - Grid√ - The anodes√ (ii) the cathode ray tube uses plates for deflection while a television tube uses coils√	(3marks) 1 mark

b) (i) $eVs = hf - hfo$ √ 3marks

at $Vs = O$, $hf = hfo$ √

$f = fo$ which is obtained by extrapolating the graph to obtain the √

value of fo when $Vs = o = 4.6$



(ii) $Vs = \frac{hf}{e} - \frac{hfo}{e}$

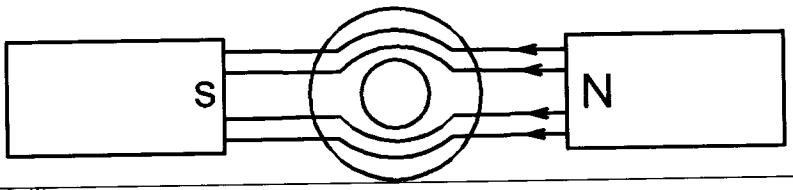
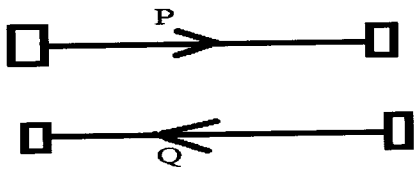
$\frac{h}{e}(f - fo)$

$\therefore \frac{h}{e} = gradient$

$= \frac{1.25 - 0.5}{(8-6)\times 10^{14}}$ √ $= \frac{0.75}{2}\times 10^{-14}$

$= 0.375\times 10^{-14}$ $\therefore h = 3.75\times 10^{-15}\times 1.6\times 10^{-19}$ (3 marks)

$= 6.0\times 10^{-34} Js$

	(iii) $Wo = hfo$ √ $= 6.0\times10^{-34}\times4.3\times10^{14}$ $= 25.8\times10^{-24}$ $25.8\times10^{-23}\,J$ √	(3 marks)
18	(a)  	(2 marks)
	b(i)  	(1 mark)
	(ii) the two conductors repel√	(1 mark)
	(iii) As the current flows a magnetic field develops around each conductor√ such that the direction of the fields such that the fields repel√ another pushing the conductors away from each other√	3 marks
	C (i) By laminating the core	(1 Mark)
	(ii) $\frac{N_s}{N_p} = \frac{V_p}{V_s}$ $\frac{N_s}{600} = \frac{24}{120}$ $N_s = 120 turns$	(3 mark)