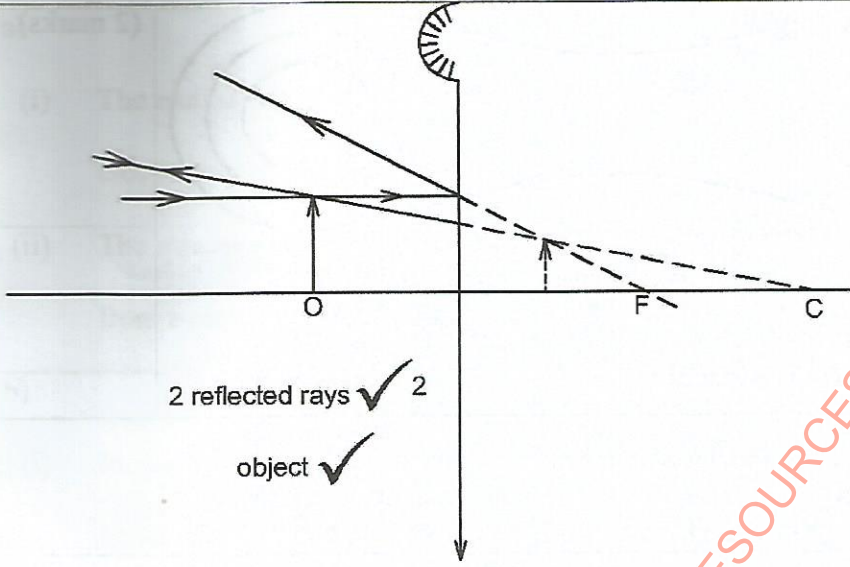


## 4.6.2 Physics Paper 2 (232/2)

## SECTION A (25 marks)

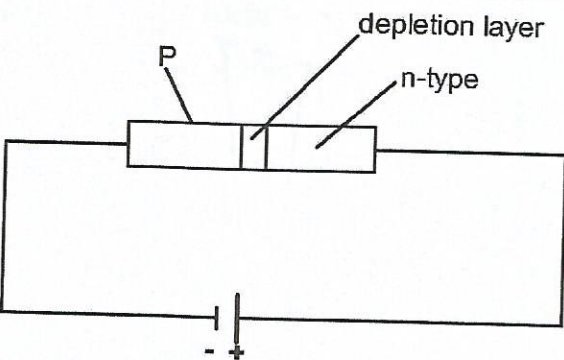
1.	Sounds produced in the studio are reflected by the walls producing echoes $\checkmark$ in the room; that interfere with the signals transmitted. The woolen materials will absorb the sound hence reduce the echo effects $\checkmark$ .	(2 marks)
2.	<ul style="list-style-type: none"> <li>- Hard x-rays have a higher frequency than soft x-ray. <math>\checkmark</math></li> <li>- Hard x-rays have more penetrating power than soft x-rays. <math>\checkmark</math></li> </ul> (only one)	(1 mark)
3.	End B is a south pole.	(1 mark)
4.	The image is blurred.	(1 mark)
5.	$\frac{\sin i}{\sin r} = \eta \quad \checkmark$ $\frac{\sin 30}{\sin x} = 1.36$ $\frac{\sin 30}{1.36} = \sin x$ $x = 21.6^\circ \quad \checkmark$	(2 marks)
6.	$I = \frac{P}{V} \quad \checkmark$ $= \frac{1800}{240} \quad \checkmark$ $= 7.5A$ Fuse rating of 8A is suitable. $\checkmark$	(3 marks)

7.	 <p>2 reflected rays ✓ 2</p> <p>object ✓</p>	(3 marks)
8.	Spontaneous disintegration of atomic nuclei by emission of radiations. ✓	(1 mark)
9.	$\frac{V_p}{V_s} = \frac{I_s}{I_p} = \frac{N_p}{N_s} \checkmark$ $\frac{600}{9000} = \frac{0.15}{I_p} \checkmark\checkmark$ $I_p = 2.25A$	(3 marks)
10.	The leaf collapses ✓ – Negative charge is induced on the tip of the pin. Pin repels negatively charged ✓ air ions which discharges the electroscope ✓.	(3 marks)
11.	Gamma, ultraviolet, purple light, infrared. ✓	(1 mark)
12.	It acts as a depolarizer. ✓	(1 mark)
13.	A battery is a group of cells connected in series or parallel. ✓	(1 mark)



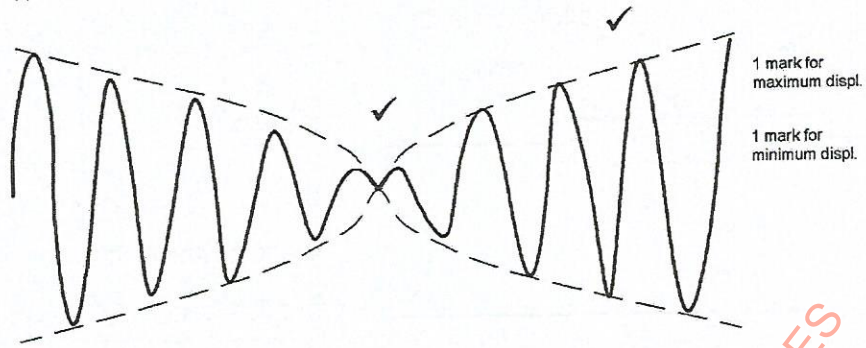
16.	a) (i) The emission of electrons from a metal surface when light/ electromagnetic radiations shine on it. ✓	(1 mark)
	(ii) The minimum frequency of radiation required to eject electrons from a metal surface. ✓	(1 mark)
	b) (i) Increased intensity increases the number of electrons emitted ✓ hence a higher current reading on the microammeter. ✓	(2 marks)
	(ii) To minimize collisions between electrons and air molecules which would cause loss of energy. ✓	(1 mark)
	c)ii (i) $h = \text{slope} \checkmark$ $= \frac{Vk.e}{Vf}$ $= \frac{(3.0 - 1.0) \times 10^{-19}}{(8 - 5.7) \times 10^{14}} \checkmark$ $= 8.69 \times 10^{-34} \text{ Js} \checkmark$	(3 marks)
	(ii) $T_e = \frac{c}{f_e} \checkmark$ $= \frac{3 \times 10^8}{4.6 \times 10^{14}} \checkmark \checkmark$ $= 6.52 \times 10^{-7} \text{ m}$	(3 marks)

17.	<p>a)</p> <p>(i) No change in frequency✓</p> <p>(ii) Wavelength increases✓</p> <p>(iii) Velocity increases✓</p>	(3 marks)
	<p>b) (i) Image is virtual hence magnification = -2</p> $\frac{v}{u} = -2 \quad v = -24\checkmark$ $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$ $\frac{1}{20} = \frac{1}{u} - \frac{1}{2u} \checkmark\checkmark$ $\frac{1}{20} = \frac{2-1}{2u}$ $u = 10\text{cm}$	(3 marks)
	<p>(ii) - a film projector✓</p> <p>-A compound microscope✓</p>	(2 marks)
	<p>c) In a camera focusing is done by changing the distance between the lens and the film. ✓</p> <p>While in the eye focusing is done by changing the curvature of the lens. ✓</p>	(2 marks)
	<p>d) - Diverging lens✓</p> <p>Forms a virtual image when the object distance is greater than the focal length. ✓</p>	(2 marks)

18. (a)	<p>(i)</p>  <p>1 mark for polarity ✓ 1 mark for showing depletion layer ✓</p>	(2 marks)
	<p>(ii) The holes and the electrons in their respective regions are attracted away from the junction by the external voltage.</p>	(1 mark)
	<p>(iii) The voltage at which the diode begins to conduct in the reverse bias mode.</p>	(1 mark)
	<p>(iv) - In rectification circuits for changing a.c. to d.c. - In control of voltages of Zener diode. (Any one correct)</p>	(1 mark)
(b)	<p>(i)</p> $f = \frac{1}{T}$ $= \frac{1}{5 \times 5 \times 10^{-3}}$ $= 40 \text{ Hz}$	(2 marks)
	<p>(ii)</p> $V_o = \left(\frac{7}{2}\right) \times 100$ $= 350 \text{ V}$	(3 marks)
	<p>(iii) Double the time control to 10ms per division. Adjust the frequency of the source to half the value</p>	(1 mark)

19.

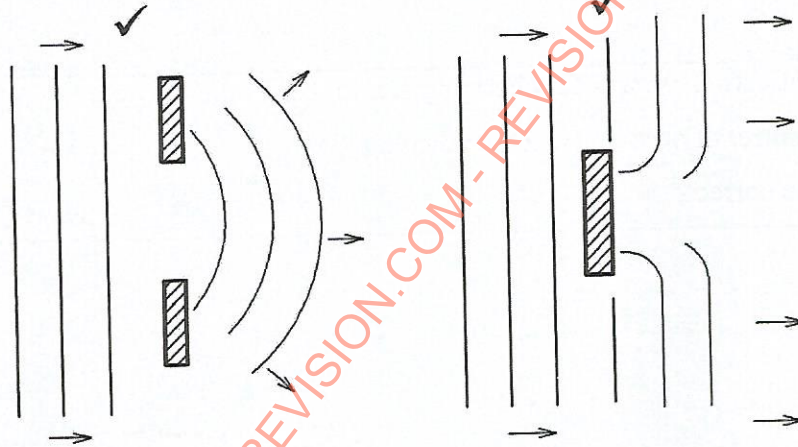
a) (i)



1 mark for maximum displacement  
1 mark for minimum displacement

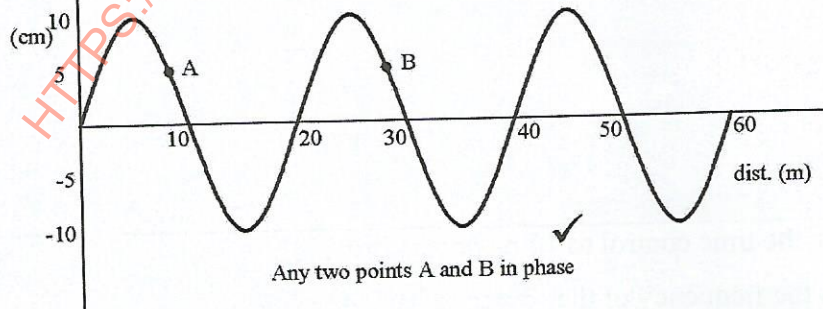
(2 marks)

b)



(2 marks)

c)



Any two points A and B in phase

Any two points A and B in phase

( 1 mark)

