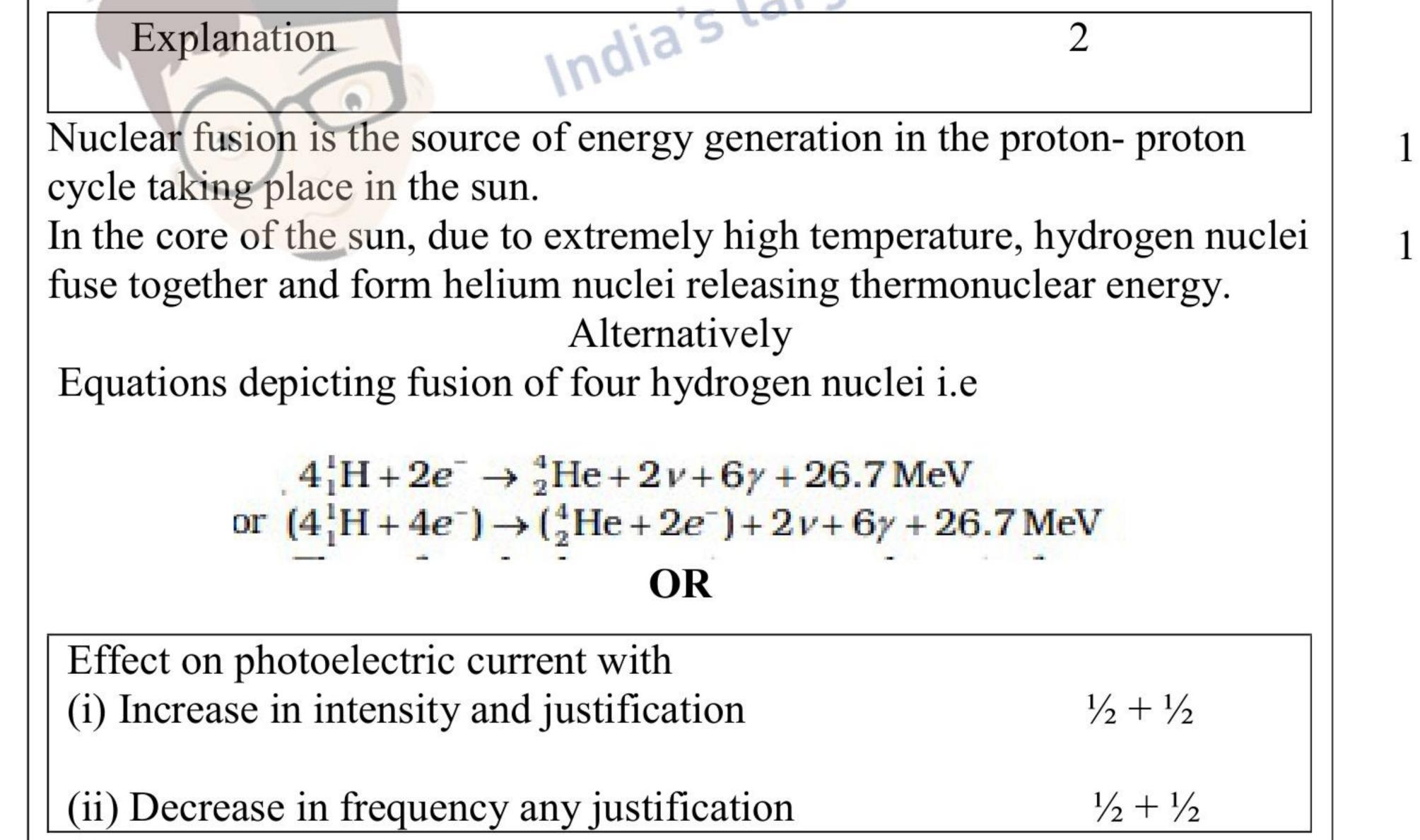
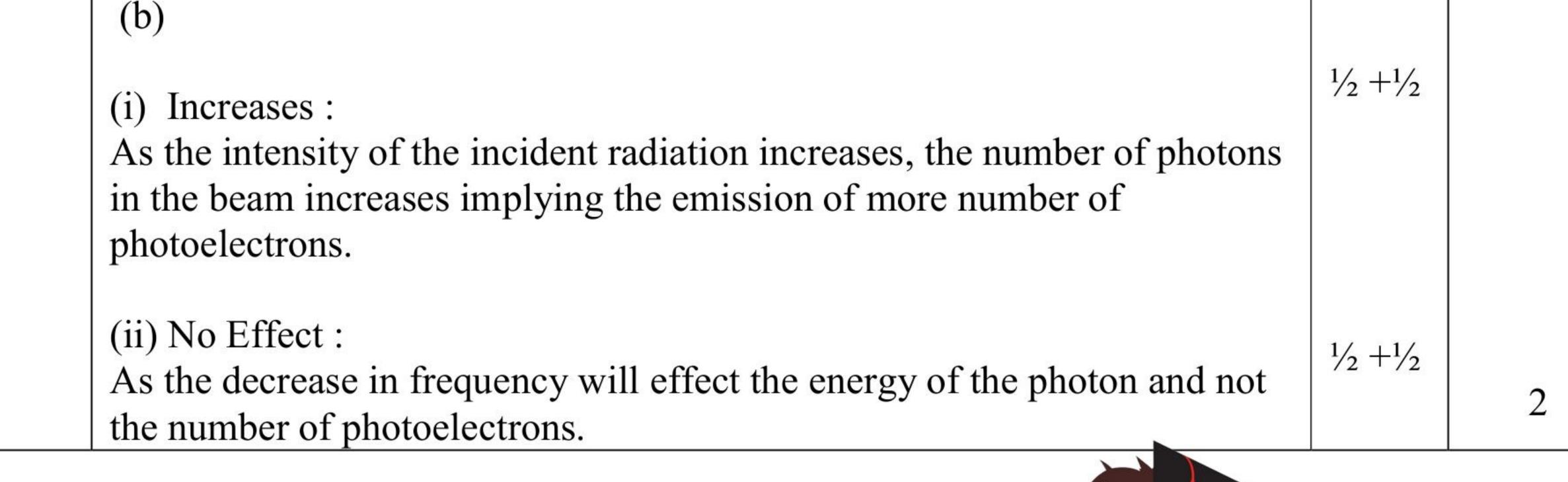
CBSE Class 12 Physics (For Visually Impaired) Compartment Answer Key 2022 (August 23, Set 4 - 55/B/6)

MARKING SCHEME

SeniorSecondary School Term IICompartment Examination,2022 PHYSICS (Subject Code–042) [Paper Code :55/B/6]

Q. No.	EXPECTED ANSWE	ER / VALUE POINTS	Marks	Total Marks
	Sectio	on - A		IVIAINS
1.	Distinction between intrinsic and ex	xtrinsic semiconductor 1+1		
	Intrinsic Semiconductor	Extrinsic Semiconductor		
	1. These are pure semiconductors having no impurity.	1. These are the semiconductors doped either with pentavalent or trivalent impurity atoms.	1	
	2. They have low electrical conductivity.	2. Their conductivity is greater than that of intrinsic semiconductors.		EO
	3. The number density of electrons and holes is equal i.e $n_e = n_h$	3. The number density of electrons and holes is different depending on the type of doping.	N Plat	form
	(Any two of the above /any other two	o difference)		2
2	(a)	Largest		







3	Difference between drift and diffusion current 1		
	Net Current at p-n junction in equilibrium 1		
	Drift Current: Movement of minority charge carriers (electrons and holes) due to the electric field generated across the junction, constitutes drift current.	1/2	
	Diffusion current: Due to the concentration gradient across p-side & n -side, holes diffuse from p-side to n-side & electrons diffuse from n-side to p-side. The current so formed is diffusion current.	1/2	
	NT / · · · · · · · · · · · · · · · · · ·	4	

	Net current at p-n junction in equilibrium is zero.	1	
			2
	Section - B		
4	(a) Definition of distance of closest approach 1		
	(b) Calculation of Kinetic energy 2		E
	(a) Centre to centre distance between the α - particle and the nuclear when the kinetic energy of α - particle is completely converted to the potential energy of the system consisting α - particle and the nucleus.	Plat	form
	Alternatively Centre to centre distance between the α - particle and the target nucleus when α - particle stops momentarily before rebounding.		

Alternatively

When an α - particle approaches a target nucleus in a head-on position, the minimum distance of the α - particle from the centre of the target nucleus just before it rebounds is called distance of closest approach.

(b)
$$r_0 = \frac{2 Z e^2}{4 \pi \epsilon_0 E_k}$$

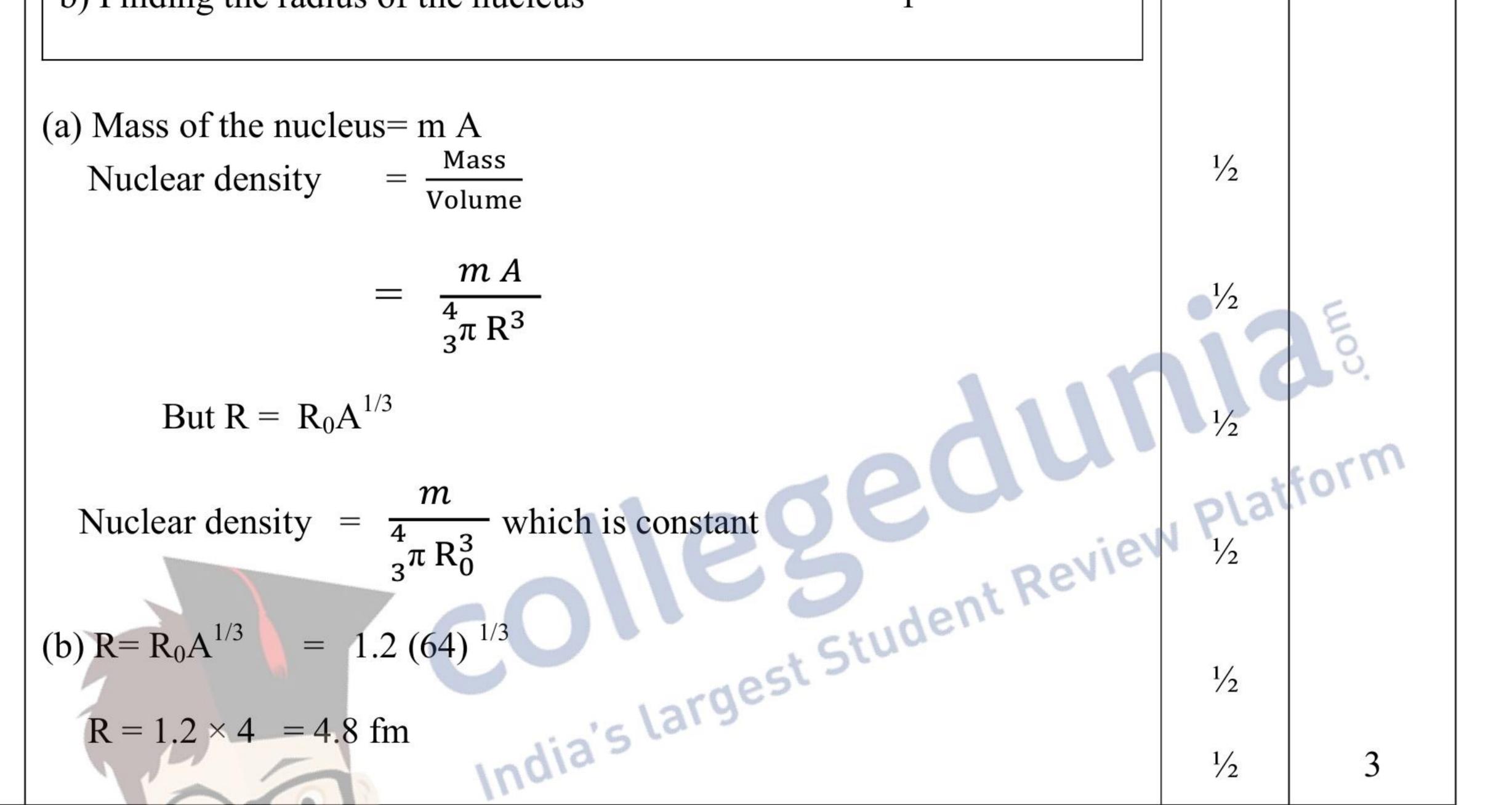
 $\therefore E_k = \frac{2 Z e^2}{4 \pi \epsilon_0 r_0}$
 $= \frac{9 \times 10^9 \times 2 \times 79 \times (1.6 \times 10^{-19})^2}{28.8 \times 10^{-15}}$
 $= 126.4 \times 10^{-14} \text{ J}$

 $\frac{1/2}{1/2}$

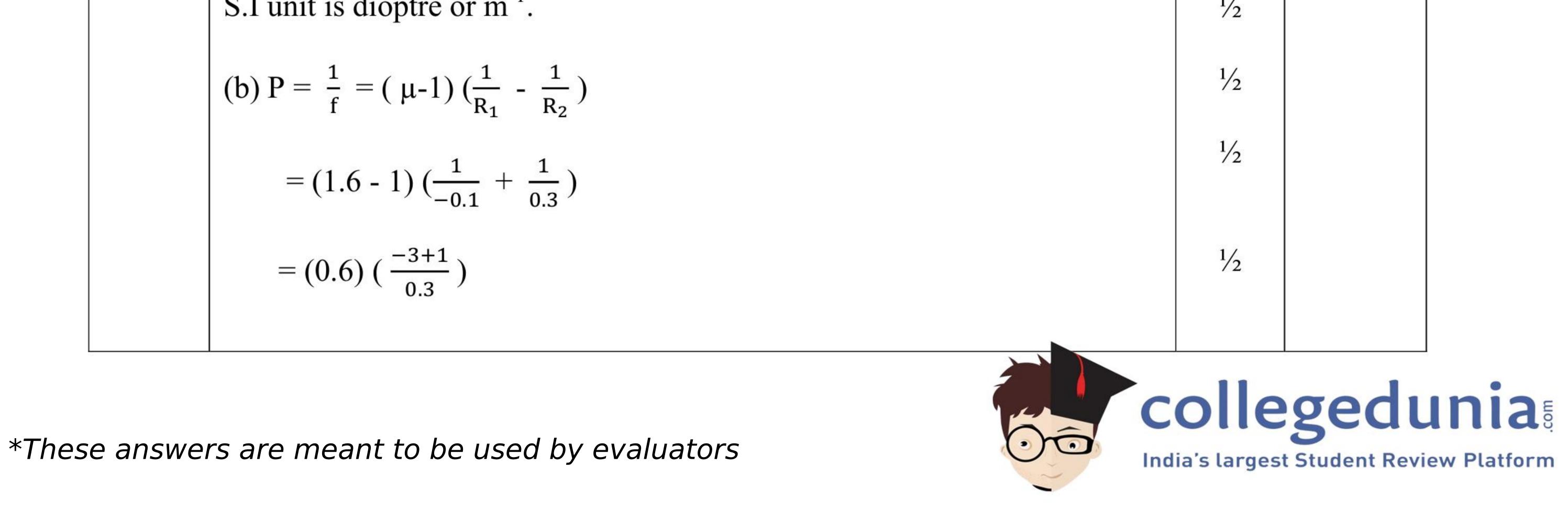
	= 7.9 MeV	, 2	3	
5	Explanation of working 1			
Э.	Two advantages 1+1			
	Working – When LED is forward biased, electrons moves from n- side to p-side & holes from p- side to n-side, the concentration of minority charge carriers at the junction boundary increases. These excess minority	1		



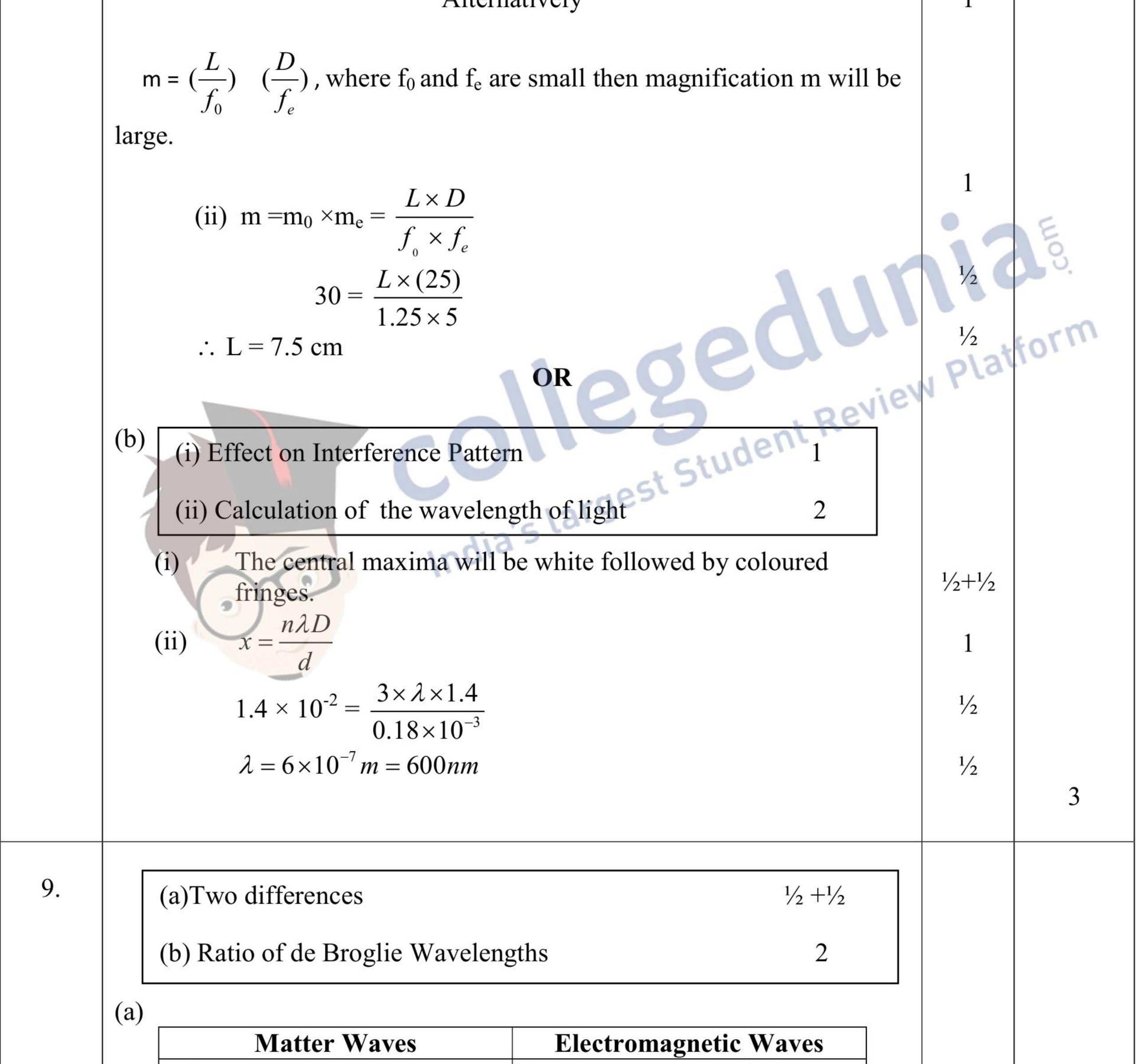
	charge carriers combine with majority charge carriers near the junction boundary and release energy in the form of photon. <u>Advantages</u> -Low operational voltage and less power/ fast action and no warm-up time required_/ the bandwidth of emitted light is nearly monochromatic/ long life and ruggedness/ fast on-off switching capability. (Any two)	1+1	3
6.	a) Proof of same nuclear density2b) Finding the radius of the nucleus1		



 a) Definition and unit of power of lens 1/2 + 1/2 b) Calculation of power 2 (a) Power of a lens is defined as the tangent of the angle by which it converges and diverges a beam of light falling at unit distance from the optical centre. Alternatively Power :- Ability to converge or diverge the beam of light incident on a lens. 	India s		1/2	3
(a) Power of a lens is defined as the tangent of the angle by which it converges and diverges a beam of light falling at unit distance from the optical centre. Alternatively Power :- Ability to converge or diverge the beam of light incident on a lens.	a) Definition and unit of power of lens	$\frac{1}{2} + \frac{1}{2}$		
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Power :- Ability to converge or diverge the beam of light incident on a lens.	converges and diverges a beam of light falling at u		1/2	
	Power :- Ability to converge or diverge the beam	of light incident on a		
Power of the lens is given by the reciprocal of its focal length.	Alternatively			

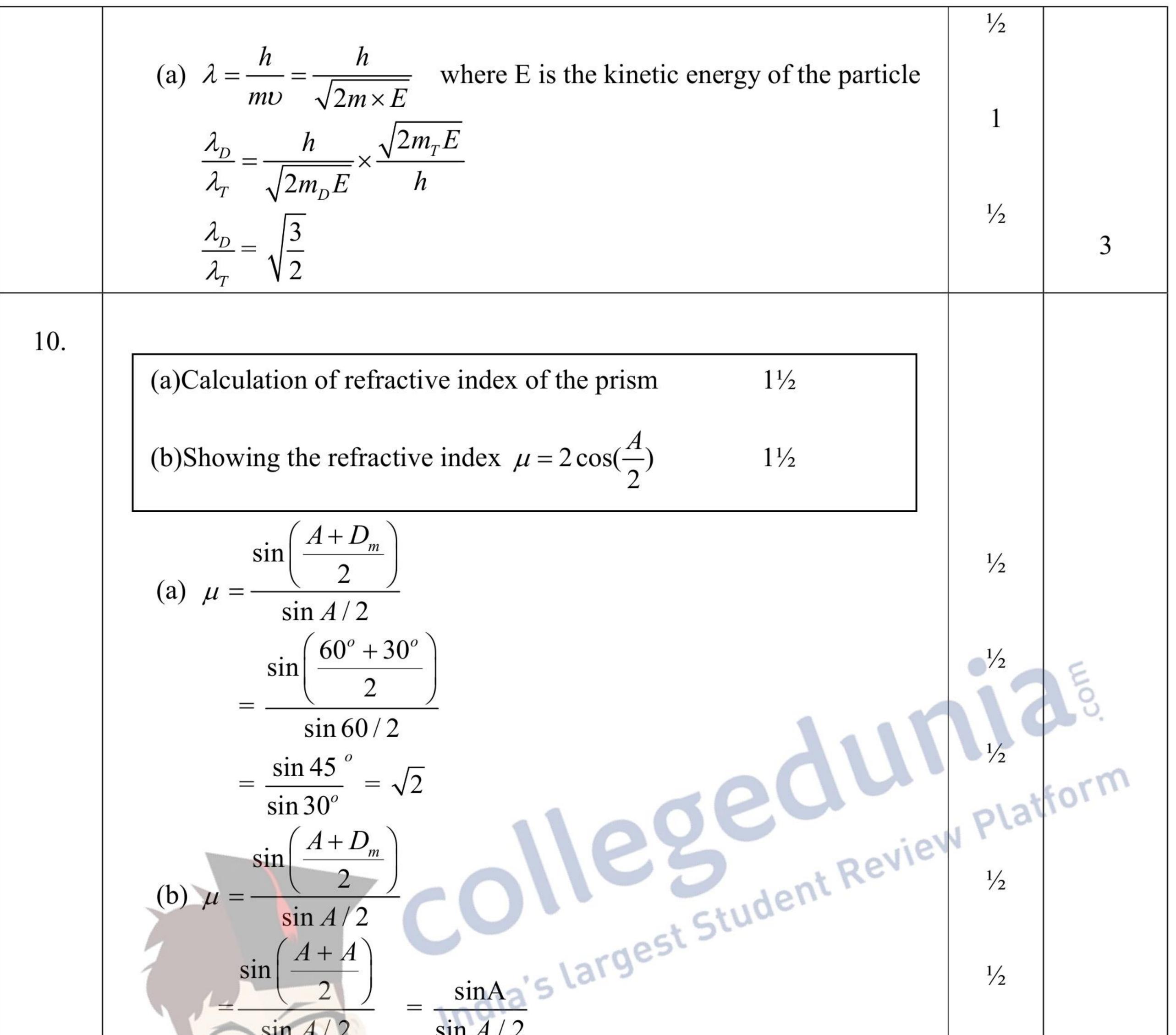


	= - 4 D		1/2	3
8.	 (a) (i) Explanation (ii) Finding the required tube length of microscope (a) (i) The magnification produced by a compound minversely proportional to the focal length of the original eyepiece. Hence short focal length increases mag 	bjective and the		
	Alternatively		1	

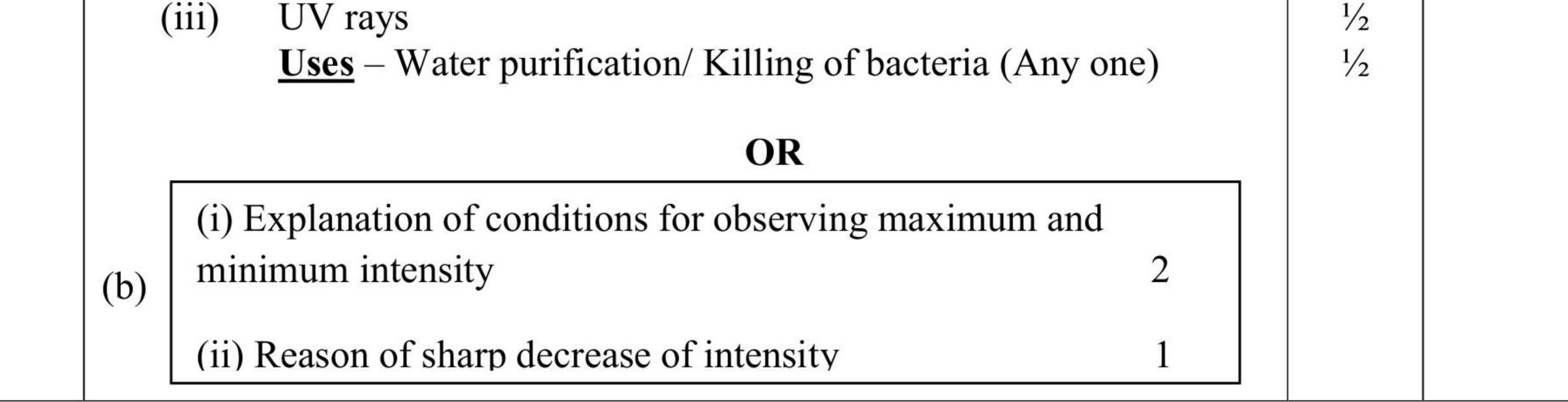


(1)Matter waves are	(1)EM waves can only be		
associated with every moving	produced by accelerating	1/2	
mass.	charged particles.		
		1/2	
(2)Matter waves associated	(2)Speed of EM wave in free		
with moving particle cannot	space is 3×10^8 m/s.		
achieve a speed of 3×10^8			
m/s.			
(Any other two difference)			





	μ=	$\frac{1}{\frac{1}{\frac{1}{\frac{1}{\frac{1}{\frac{1}{\frac{1}{\frac{1}$	1/2	3
11	(a)	Naming of EM waves (i), (ii) & (iii) $\frac{1}{2} + \frac{1}{2} + \frac{1}{2}$		
		One use of each EM wave $\frac{1}{2} + \frac{1}{2} + \frac{1}{2}$		
		i) $\gamma - rays$	1/2	
		<u>Uses</u> – Radiotherapy / Sterilization and disinfection / Research purpose (Any one)	1/2	
	(ii) Infrared Waves	1/2	
		<u>Uses</u> - Heat sensors/Thermal imaging/ night vision equipment / Remote control (Any one)	1/2	
			1/	





(i) When the path difference (p) = d sin $\theta = (2n+1)\frac{\lambda}{2}$, then the secondary wavelets starting from consecutive parts of slit having a path difference of $\lambda/2$ except the last part, cancel each other contribution, leading to formation of maxima at a point on the screen. When the path difference (p) = $d\sin\theta = n\lambda$, then secondary wavelets starting from consecutive parts of the slit having path difference of $\lambda/2$ cancel each other contribution leading to formation of minima at a point on the screen.

(ii) Maximum intensity is obtained at a point on the screen when the path difference is (2n+1) $\frac{\lambda}{2}$. With increasing 'n' only one- third, one-fifth,

