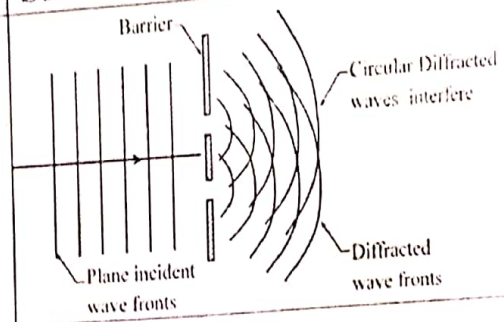
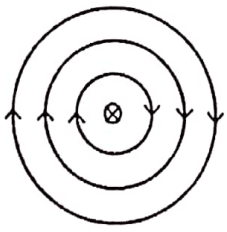
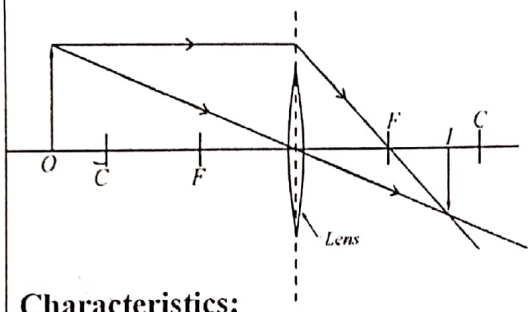
Number	Solution	Remarks	Mark
Section A (Qn 1-40)	SECTION A (40 MARKS) 1. A 9. C 17. B 25. C 33. A 2. A 10. B 18. B 26. B 34. D 3. A 11. A 19. B 27. C 35. C 4. C 12. A 20. D 28. D 36. C 5. D 13. D 21. C 29. D 37. C 6. B 14. A 22. C 30. A 38. C 7. A 15. A 23. B 31. D 39. D 8. A 16. B 24. B 32. A 40. A		@01mark
Section B (Qn 41-50)	SECTION B (40 MARKS)		@)04mrks
Qn 41 (a)	**Linear momentum** refers to the product of mass of a body and its linear velocity.		
(b)	Rate of change of momentum $= \frac{mv - mu}{t}$ $= \frac{2.4(36-12)}{10}$ $= 5.76\, kg\, m^{-2}$		
Qn 42 (a)(i)	An **electromagnetic** wave refers to a high frequency wave produced when an electric and magnetic fields oscillate perpendicular to each other in the same medium.		
(ii)	- Have high frequencies and short wavelength compared to other waves - Travel at $3.0\times10^{8}\, ms^{-1}$. - They are transverse waves. - Travel in straight lines. - Can travel through a vacuum. - Are highly penetrative. - Can blacken a photographic film.		

Number	Solution	Remarks	Mark
(b)			
Qn 43 (a)(i)	*A*- Cooling fins. *B*- Filament heater.		
(ii)	*A*- To conduct heat from the hot anode to the surrounding. *B*- To heat the cathode so as to emit electrons thermionically.		
(b) (i)	Tungsten has a high melting point compared to other readily available metal targets.		
(ii)	To prevent electrons from colliding with the air molecules which would reduce the kinetic energy of electrons, hence affecting *X*-ray production.		
Qn 44 (a)(i)	**Primary cell** refers to a cell which can not be recharged once used up.		
(ii)	✓ Polarization. This can be minimised by; - - Adding a depolarizer (potassium dichromate) to oxidize hydrogen into water. - Brushing off the hydrogen bubbles from the copper plate using a small paint brush.		

Number	Solution	Remarks	Mark
	✓ Local action. This can be minimized by; - - Cleaning the zinc plate using sulphuric acid and rubbing it with mercury (Zinc amalgamation). - Using pure zinc.		
(b)	Using, $E = I(R + r)$, E =1.5V, I =0.125 A, R =10Ω $\Rightarrow 1.5 = 0.125(10 + r)$ $\therefore$ Internal resistance, $r = 2\Omega$		
Qn 45 (a)	**Acceleration due gravity** refers to the rate of change of velocity with time for a free falling object.		
(b)	By conservation of energy; Gain in K.E = Loss in P.E $\Rightarrow \frac{1}{2}mv^2 = mg(h - h')$ $\Rightarrow v^2 = 2 \times 10 \times (60 - 36)$ $\therefore v = 21.9089023 ms^{-1}$		
Qn 46 (a)	Look into the solenoid in which the bar is placed. If the current flow is in clockwise direction then, the pole is a **south pole**. However, if the current flow is in anti-clockwise direction then, the pole is a **north pole**.		
(b)			
(c)	- Increasing the size of current through the wire. - Increasing the number of wires		

<table>
<tr><th>Number</th><th>Solution</th><th>Remarks</th><th>Mark</th></tr>
<tr><td>Qn 47(a)(i)</td><td>Radioactivity is the random and spontaneous disintegration of an un-stable nucleus into a stable nucleus with the emission of radiations.</td><td></td><td></td></tr>
<tr><td>(ii)</td><td>Differences;
<table>
<tr><td>Alpha particles</td><td>Beta particles</td></tr>
<tr><td>-Positively charged.</td><td>-Negatively charged.</td></tr>
<tr><td>- More ionizing.</td><td>- Less ionizing.</td></tr>
<tr><td>- Less penetrative.</td><td>-More penetrative.</td></tr>
<tr><td>- Can be stopped by a thick piece of paper.</td><td>- Can be stopped by a piece of aluminium.</td></tr>
</table>
Similarities;
- Blacken photographic film.
- Ionize gas molecules.
- Deflected by a magnetic field.
- Deflected by an electric field.
- Penetrate through matter.
- Cause fluorescence when they strike fluorescent materials.</td><td></td><td></td></tr>
<tr><td>(b)</td><td>
<table>
<tr><td>No.of protons</td><td>No.of electrons</td><td>No.of neutrons</td></tr>
<tr><td>138</td><td>138</td><td>250-138 = 112</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>Qn 48 (a)</td><td>Specific heat capacity refers to the quantity of heat required to raise the temperature of 1kg of a substance by 1K.</td><td></td><td></td></tr>
<tr><td>(b)</td><td>$Q = \left(m_i c_i \Delta\theta + m_w L_f\right), m_i = m_w$
$\Rightarrow Q = 2.5\left(\left[2100 \times \left(0 - {}^{-}15\right)\right] + 356000\right)$
$\therefore \ Q = 968750J$</td><td></td><td></td></tr>
</table>

Number	Solution	Remarks	Mark
Qn 49 (a)	Power, $P = \frac{1}{f(\text{in metres})}$. But, $f = +20cm = +\frac{20}{100} = +0.2m$. Thus, $P = \frac{1}{0.2} = +5\ \text{D}$		
(b)	 **Characteristics;** The image formed is; - - Real - Inverted. - Diminished. - Between F and C.		
Qn 50 (a)	**Archimedes' principle** states that when a body is wholly or partially immersed in a fluid, it experiences an up thrust which is equal to the weight of the fluid displaced.		
(b)	- The buoy. - Ships and boats. - Submarines. - Meteorological (hot air) balloons.		
(c)	The metals used are made hollow and thus contain air. The average density of the ship is thus less than the density of the displaced water. Therefore, up thrust due water is greater than the weight of the ship and so, the ship floats on water.		

END