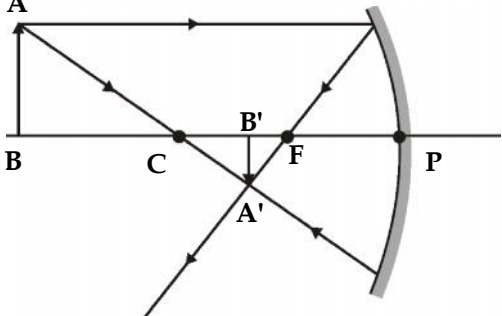




(2)	<p>(i) The group number indicates the number of valence electrons i.e. electrons present in the outermost shell.</p> <p>(ii) The atoms of halogens have seven electrons in their outermost orbit with outermost orbit incompletely filled. Hence, halogens are placed in group VII A.</p>	2										
(3)	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;">Alkali metals</th> <th style="width: 50%; text-align: center;">Alkaline earth metals</th> </tr> </thead> <tbody> <tr> <td data-bbox="300 577 794 678">(i) In the Modern Periodic Table, IA group elements are alkali metals.</td> <td data-bbox="826 577 1305 678">(i) In the Modern Periodic Table, IIA group elements are alkaline earth metals.</td> </tr> <tr> <td data-bbox="300 701 794 801">(ii) Atoms of these elements have one electron in the valence shell.</td> <td data-bbox="826 701 1305 801">(ii) Atoms of these elements have two electrons in their valence shell.</td> </tr> <tr> <td data-bbox="300 824 794 857">(iii) They are monovalent.</td> <td data-bbox="826 824 1305 857">(iii) They are divalent.</td> </tr> <tr> <td data-bbox="300 880 794 947">(iv) Their oxides and hydroxides dissolve readily in water.</td> <td data-bbox="826 880 1305 947">(iv) Their oxides and hydroxides dissolve slightly in water.</td> </tr> </tbody> </table>	Alkali metals	Alkaline earth metals	(i) In the Modern Periodic Table, IA group elements are alkali metals.	(i) In the Modern Periodic Table, IIA group elements are alkaline earth metals.	(ii) Atoms of these elements have one electron in the valence shell.	(ii) Atoms of these elements have two electrons in their valence shell.	(iii) They are monovalent.	(iii) They are divalent.	(iv) Their oxides and hydroxides dissolve readily in water.	(iv) Their oxides and hydroxides dissolve slightly in water.	2
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(4)	<p>When calcium carbonate is heated, it decomposes to form calcium oxide (quick lime) and carbon dioxide gas. As heat is absorbed, it is an endothermic reaction. Since the decomposition is brought by heat, it is also called as thermal decomposition.</p> $\text{CaCO}_{3(s)} \xrightarrow{\text{heat}} \text{CaO}_{(s)} + \text{CO}_2 \uparrow$ <p style="text-align: center;"> <span style="margin-right: 100px;">Calcium carbonate</span> <span>Calcium oxide</span> <span>Carbon dioxide</span> </p>	2										
(5)	<p>(i) The filament of a bulb has to get heated to a very high temperature to emit light.</p> <p>(ii) If a filament of low melting point is used, it would melt and the bulb would become useless.</p> <p>(iii) Hence, a filament of high melting point is used so that the bulb can be used for a long time.</p>	2										
(6)	<div style="border: 1px solid black; padding: 10px; text-align: center;">  <p><b>Image position :</b> Between centre of curvature and focus.</p> <p><b>Nature :</b> Real, inverted and diminished.</p> </div>	2										

(7)	<b>Voltmeter</b>	<b>Ammeter</b>	<b>2</b>
	(i) It is an instrument to measure the potential difference between the two terminals of a cell. (ii) It is connected in parallel with the cell. (iii) It has a very high resistance.	(i) It is an instrument to measure the electric current flowing through the circuit. (ii) It is connected in series with the cell. (iii) It has a very low resistance.	
<b>A.4.</b>	<b>Answer the following in brief : (Any 5)</b>		
(1)	(i) Hydrogen resembles alkali metals as well as halogens. Therefore, no fixed position could be given to hydrogen in the periodic table. (ii) Isotopes of same elements have different atomic masses; therefore each one of them should be given different position. On the other hand as isotopes are chemically similar, they had to be given same position. (iii) At certain places, an element of higher atomic mass has been placed before an element of lower atomic mass. For eg, cobalt (Co = 58.93) is placed before nickel (Ni = 58.71). (iv) Some elements placed in the same sub-group had different properties. Eg. Manganese (Mn) is placed with halogens which totally differ in the properties.		<b>3</b>
(2)	When oxidation and reduction take place simultaneously in a given reaction, it is termed as redox reaction. During oxidation a reactant combines with oxygen or loses hydrogen and during reduction it gains hydrogen or loses oxygen. Example of Redox reaction : $  \begin{array}{c}  \text{Oxidation (O}_2 \text{ added)} \\  \downarrow \qquad \qquad \qquad \downarrow \\  2\text{H}_2\text{S} + \text{SO}_2 \rightarrow 3\text{S} + 2\text{H}_2\text{O} \\  \uparrow \qquad \qquad \qquad \uparrow \\  \text{Reduction (O}_2 \text{ lost)}  \end{array}  $ In the above reaction SO <sub>2</sub> is reduced and H <sub>2</sub> S is oxidized.		<b>3</b>
(3)	(a) (i) The fats and oil present in the chips turn foul when they are preserved for a long time and this changes their taste too. (ii) This happens due to oxidation of oil, as the oil becomes		<b>2</b>

	<p>rancid.</p> <p>(iii) Nitrogen is a less reactive gas and prevents the oil from getting oxidized.</p> <p>(iv) Therefore to prevent the chips from getting spoilt manufacturers flush bags of chips with nitrogen.</p> <p>(b) <b>Endothermic reaction</b> : A reaction accompanied by absorption of heat is called endothermic reaction.</p>	1
(4)	<p>1. The eye defect is myopia</p> <p>2. The two possible reasons of myopia :</p> <p>(a) As ciliary muscles do not relax sufficiently, converging power of eye lens becomes high.</p> <p>(b) The distance between eye lens and retina increases as the eyeball is lengthened or lens is curved.</p> <p>3. Concave lens of suitable focal length can correct this defect.</p>	3
(5)	<p>The rules are as follows :</p> <p>1. If the incident ray is parallel to the principal axis, then the reflected ray passes through focus.</p> <p>2. If the incident ray is passing through the focus, then the reflected ray is parallel to the principal axis.</p> <p>3. If the incident ray passes through the centre of curvature, the reflected ray traces the same path.</p>	3
(6)	<p>(a) <b>Ohms' Law</b> : The electric current (I) flowing in a metallic conductor is directly proportional to the potential difference (V) across its terminals, provided physical conditions of the conductor such as length, area of cross section, temperature and material remain constant. <math>V \propto I</math> or <math>R = \frac{V}{I}</math></p> <p>(b) The SI unit of resistivity is ohm-metre.</p>	2
(7)	<p>Given : Object size (<math>h_1</math>) = 3 cm</p> <p>Object distance (u) = - 20 cm</p> <p>Focal length (<math>f</math>) = - 12 cm</p> <p>To find : 1. Image distance (v) = ?</p> <p>2. Image size (<math>h_2</math>) = ?</p> <p>3. Nature of image = ?</p>	3

$$\text{Formula : } \frac{1}{v} + \frac{1}{u} = \frac{1}{f}$$

$$M = \frac{h_2}{h_1} = \frac{-v}{u}$$

$$\text{Solution : } \frac{1}{v} + \frac{1}{u} = \frac{1}{f}$$

$$\therefore \frac{1}{v} = \frac{1}{f} - \frac{1}{u}$$

$$\therefore \frac{1}{v} = \frac{1}{-12} - \frac{1}{-20}$$

$$\therefore \frac{1}{v} = \frac{-5 + 3}{60}$$

$$\therefore \frac{1}{v} = \frac{-2}{60}$$

$$\therefore v = -30\text{cm.}$$

The screen should be placed at 30cm from the mirror. The image is real.

$$M = \frac{h_2}{h_1} = \frac{-v}{u}$$

$$\therefore h_2 = \frac{-v h_1}{u}$$

$$\therefore h_2 = \frac{-(-30)(3)}{-20}$$

$$\therefore h_2 = -4.5\text{cm}$$

Height of the image is 4.5cm. It is an inverted and enlarged image.

**A.5. Answer in detail: (Any 1)**

- (1) (i) The arrangement in (A), is series.  
 (ii) The arrangement in (B), is parallel.  
 (iii) In parallel combination, the resistance would be less.  
 (iv) The bulbs in parallel combination would be brighter, as the resultant resistance in parallel is less, hence current flowing would be more and brightness will also be more.

(2)	Based on electronic configuration, the modern periodic table is divided into four blocks namely, s-block, p-block, d-block, f-block.				<b>5</b>	
		<b>s - block</b>	<b>p - block</b>	<b>d - block</b>		<b>f - block</b>
	<b>No. of shells incomplete/valence electrons</b>	Outermost shell incomplete (1 or 2 valence electrons).	Outermost shell incomplete except zero group elements that have completely filled shells (3 to 8 valence electrons).	Last two shells incomplete.		Last three shells incomplete.
	<b>Position</b>	IA, IIA and hydrogen.	III A to VII A and zero group.	Group IIIB to IIB along with group VIII.		Lanthanides and actinides placed separately at the bottom of the periodic table.
	<b>Includes</b>	All metals except hydrogen.	Metals, non-metals, metalloids, zero group elements.	Metals.		Metals.
	<b>Types of elements</b>	Normal elements.	Normal and inert elements.	Transition elements.		Inner-transition elements.
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