

**MARKING SCHEME CHEMISTRY MODEL PAPER CLASS 9**

**SCORING KEYS SECTION: A (MCQs)**

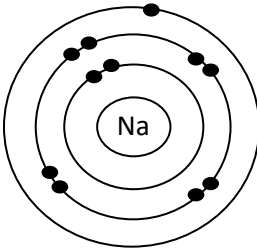
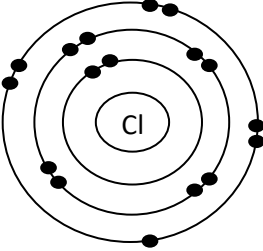
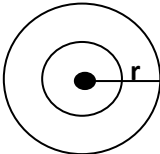
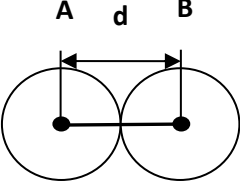
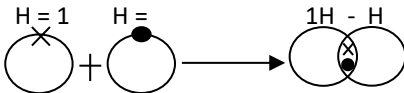
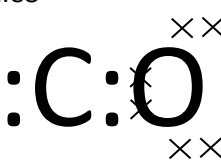
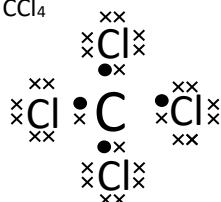

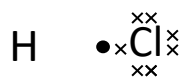
**Marks: 12**

MCQs #	OPTION	ANSWER
1	B	Air
2	C	63
3	A	Nucleus
4	B	Group
5	D	An Ion
6	D	O <sup>-2</sup>
7	C	Diffusion
8	D	Liquid in Gas
9	B	K <sup>+</sup> and Cl <sup>-</sup>
10	C	Colloids
11	A	+7
12	D	Radium

# RUBRICS

## SECTION –B

Marks: 32

Q.NO 1	Question	Reference
i. Possible answer	<p><b>Atomic Number (Z):</b> Atomic number of an element is the number protons present in the nucleus of one atom of that element. It is represented by Z. e.g. Atomic Number of Carbon is 6 so it has 6 Protons.</p> <p><b>Mass Number (A):</b> The mass number of an atom is equal to the sum of the number of protons and neutrons present in the nucleus. It is also called nucleon number. It is represented by A. e. g. mass number of carbon is 12. It has 6 protons and 6 neutrons in the nucleus.</p>	<p><b>Chemistry</b> Textbook 9<sup>th</sup>Textbook Board KPK, Peshawar</p>
Checking Hints+Marks	1 mark of definition +1 mark of example +1 mark of definition +1 mark of example = <b>Total 4 marks</b>	
ii. Possible answer	<p><b>Na<sup>11</sup> Main Shell Electronic Configuration</b> K = 2 , L = 8 , M = 1</p> <p><b>Sub Shell Electronic Configuration</b> 1S<sup>2</sup>, 2S<sup>2</sup>, 2P<sup>6</sup> , 3S<sup>1</sup></p> <p><b>Cl<sup>17</sup> Main Shell Electronic Configuration</b> K = 2, L = 8 , M = 7</p> <p><b>Sub shell Electronic Configuration</b> 1S<sup>2</sup>, 2S<sup>2</sup>, 2P<sup>6</sup> , 3S<sup>2</sup>, 3P<sup>5</sup></p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div>	<p><b>Chemistry</b> Textbook 9<sup>th</sup>Textbook Board KPK, Peshawar</p>
Checking Hints+Marks	2Marks for (Main shell)+ 2 Marks for (Sub Shell)= <b>Total 4 marks</b>	
iii. Possible answer	S-Block elements of the Periodic Table can accommodate only two electrons so they have only two groups. IA Alkali Metals and IIA Alkaline Earth Metals.	<p><b>Chemistry</b> Textbook 9<sup>th</sup>Textbook Board KPK, Peshawar</p>
Checking Hints+Marks	Correct Reasoning allocated <b>4 Marks</b>	
iv. Possible answer	<p><b>Atomic Radii:</b> The distance between the nucleus and the valence shell of an atom is termed as atomic radius. It is represented by r.</p> <div style="text-align: center;">  </div> <p><b>Covalent Radii:</b> The one half of the distance between the nuclei of two similar atoms of the same molecule containing a single covalent bond is called covalent radii. It is represented by "d".</p> <div style="text-align: center;">  </div>	<p><b>Chemistry</b> Textbook 9<sup>th</sup>Textbook Board KPK, Peshawar</p>
Checking Hints+Marks	Definition 1 + 1 , Representation 1 + 1 = <b>Total 4 marks</b>	
v. Possible answer	<p><b>Covalent Bond:</b> A covalent Bond is formed when two atoms are joined together by sharing of electrons. It is formed between two non-metal elements.</p> <div style="text-align: center;">  </div> <p><b>Types of Covalent Bond:</b> There are three types of covalent bond</p> <ol style="list-style-type: none"> <li>i. Single Covalent Bond: The bond in which two atoms share one electron each to form a pair of electrons. e.g. H<sub>2</sub>, H-H</li> <li>ii. Double Covalent Bond: The bond in which two atoms share two electrons each to form two pairs of electrons. e.g. O<sub>2</sub>, O=O</li> <li>iii. Triple Covalent Bond: the bond in which two atoms share three electrons each, to form three pairs of electrons. e.g. N<sub>2</sub>, N≡N</li> </ol>	<p><b>Chemistry</b> Textbook 9<sup>th</sup>Textbook Board KPK, Peshawar</p>
Checking Hints+Marks	Definition 1 + Each Type 3 = <b>Total 4 marks</b>	
vi. Possible answer	<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>i. CO</p> <div style="text-align: center;">  </div> </div> <div style="width: 30%;"> <p>ii. CCl<sub>4</sub></p> <div style="text-align: center;">  </div> </div> <div style="width: 30%;"> <p>iii. SO<sub>2</sub></p> <div style="text-align: center;">  </div> </div> </div> <p>iv. HCl</p> <div style="text-align: center;">  </div>	<p><b>Chemistry</b> Textbook 9<sup>th</sup>Textbook Board KPK, Peshawar</p>
Checking Hints+Marks	1 Mark is for each structure = <b>Total marks : 4</b>	

vii. Possible answer	There is large space between the particles of the gas and they have weak intermolecular forces so they can be compressible. While in solids the molecules of the solid are closely packed and there is no space between the molecules of the solid. They have strong intermolecular forces so they are not compressible.	<b>Chemistry</b> Textbook 9 <sup>th</sup> Textbook Board KPK, Peshawar
Checking Hints+Marks	2 marks for each reason = <b>Total 4 marks</b>	
viii. Possible answer	Molarity is the number of moles of solute dissolved per dm <sup>3</sup> (Litre) of solution. It is represented by "M". Formula used for molarity is $\text{Molarity (M)} = \frac{\text{Number of moles of Solute}}{\text{Volume of solution in dm}^3}$ Molarity can also be given as $M = \frac{\text{Amount of Solute in gram}}{\text{Molecular mass of Solute} \times \text{Volume of solution in dm}^3}$	<b>Chemistry</b> Textbook 9 <sup>th</sup> Textbook Board KPK, Peshawar
Checking Hints+Marks	1 Mark for definition 1 Mark for Symbolic representation and 2 marks for each formula = <b>Total 4 marks</b>	
ix. Possible answer	<b>Colloids:</b> i. Particles that are intermediate in size between solution and suspension form mixtures known as colloidal dispersion or simply colloids. ii. They have uniform composition throughout the solution. iii. Their particles do not settle down at the bottom. iv. examples : Milk, Cheese, Butter <b>Suspension:</b> i. A suspension is a heterogeneous mixture of undissolved particles in a given medium. ii. They do not have uniform composition. iii. Their particles settle down at the bottom. iv. Examples: Flour in water, Mud in water, Chalk in water	<b>Chemistry</b> Textbook 9 <sup>th</sup> Textbook Board KPK, Peshawar
Checking Hints+Marks	2 marks each for colloids and suspensions = <b>Total 4 marks</b>	
x. Possible answer	<b>Oxidizing Agent:</b> The oxidizing agent is the species that oxidizes a substance and itself get reduced. e.g. KMnO <sub>4</sub> , K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> , HNO <sub>3</sub> and Cl <sub>2</sub> etc <b>Reducing Agent:</b> it is the species that reduces a substance and itself get oxidized e.g. H <sub>2</sub> S, SO <sub>2</sub> , Na, Al and Mg etc	<b>Chemistry</b> Textbook 9 <sup>th</sup> Textbook Board KPK, Peshawar
Checking Hints+Marks	1 mark for definition of oxidation agent and 1 mark for its example = 2 marks 1 mark for definition of reducing agent and 1 mark for its example = 2 marks <b>1+1+1+1= Total 4 marks</b>	
xi. Possible answer	<b>Soft Metals:</b> i. The metals present in group I <sup>st</sup> A and II <sup>nd</sup> A are called soft metals. ii. They have low ionization energy and are very electro positive so they are very reactive. iii. Their melting and boiling points are very low. 4. Example: Sodium, <b>Hard Metals:</b> i. These metals are present in d-Block elements. ii. They have high ionization energies and are less electro positive so they are less reactive. iii. Their melting and boiling points are very high. 4. Example: Iron	<b>Chemistry</b> Textbook 9 <sup>th</sup> Textbook Board KPK, Peshawar
Checking Hints+Marks	2 marks each for Soft Metals and Hard Metals = <b>Total 4 marks</b>	

### SECTION-C

**Marks: 21**

**Q.2**

**i. Rutherford's Atomic Model**

1. Atom consists of positively charged central portion called nucleus
2. Electrons are revolving around the nucleus with very high speed just like the planets around the sun.
3. The size of the nucleus is very small as compared to the size of the atom and most of the volume occupied by the atom is empty.
4. Atom is neutral as the number of electrons is numerically equal to that of protons.
5. Nucleus is responsible for mass and energy of the atom.

Checking Points	4 points for correct description of Rutherford's atomic model = <b>Total 4 marks</b>
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**ii. Benzene (C<sub>6</sub>H<sub>6</sub>)**

$$\begin{aligned}
 \text{C}_6\text{H}_6 &= 6 \text{ (atomic mass of carbon)} + 6 \text{ (atomic mass of hydrogen)} \\
 &= 6(\text{C}) + 6(\text{H}) \\
 &= 6(12) + 6(1) \\
 &= 72+6= 78 \text{ a.m.u}
 \end{aligned}$$

**Ethane gas (C<sub>2</sub>H<sub>6</sub>)**

$$\begin{aligned}
\text{C}_2\text{H}_6 &= 2 (\text{atomic mass of carbon}) + 6 (\text{atomic mass of hydrogen}) \\
&= 2(\text{C}) + 6 (\text{H}) \\
&= 2(12) + 6 (1) \\
&= 24+6= 30 \text{ a.m.u}
\end{aligned}$$

**Iron Oxide (Fe<sub>2</sub>O<sub>3</sub>)**

$$\begin{aligned}
\text{Fe}_2\text{O}_3 &= 2 (\text{atomic mass of iron}) + 3 (\text{atomic mass of oxygen}) \\
&= 2(\text{Fe}) + 3 (\text{O}) \\
&= 2(56) + 3 (16) \\
&= 112+48= 160 \text{ a.m.u}
\end{aligned}$$

<b>Checking Points</b>	<b>Each numerical contain 1 mark = Total 3 marks</b>
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**Q.3**

**i. Electronegativity:** The ability of an atom to attract the shared pair of electrons towards itself in a covalent band is called electronegativity. It is represented by

E.N

**Electronegativity in the groups**

The electronegativity at the top of the group is maximum while down the group is minimum.

**Electronegativity in the periods**

When we move from left to right in the periodic table the electronegativity value increases from left to right so the elements at the extreme right have maximum electronegativity.

<b>Checking Points</b>	1 mark for Definition of electronegativity and 2 marks for its trends = <b>Total 3 marks</b>
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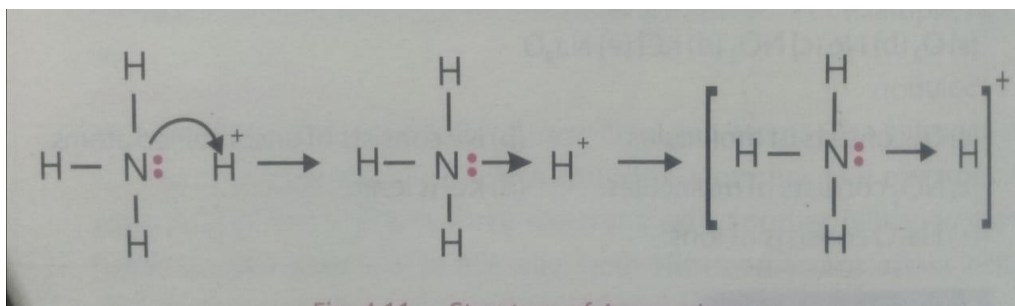
**ii. Dative or Coordinate covalent bond**

The covalent bond in which only one atom donates the shared pair of electrons is called coordinate covalent bond or Dative bond.

The atom, which donates the shared pair of electrons is called donor atom while the atom which accepts the shared pair of electrons is called acceptor atom. An arrow ( → ) represents the coordinate covalent bond e.g. Ammonium ion

In ammonium molecule Nitrogen atom is bounded to three Hydrogen atoms. There is still one unshared pair of electrons with the Nitrogen. The H<sup>+</sup>

is electron deficient species. Therefore Nitrogen donates this lone pair of electron while Hydrogen ion accepts forming Ammonium ion.



<b>Checking Points</b>	1 mark for definitions 1 for representation 2 marks for example + explanation = <b>Total 4 marks</b>
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**Q.4**

**i. Evaporation**

The phenomena in which liquid is converted into its vapours without external heating is called evaporation. Or simply we can see that the conversion of liquid state into gaseous state at room temperature is called evaporation.

**Factors affecting evaporation**

**a. Surface area**

The process of evaporation takes place from the surface. Greater the surface area, higher will be the rate of evaporation and vice versa

**b. Temperature**

With the increase in temperature, the average kinetic energy of the liquid molecules increases, so the rate of evaporation increases.

**c. Intercellular force**

Evaporation of liquids depends upon the intermolecular forces. Stronger the intermolecular forces, slow will be the rate of evaporation and vice versa.

<b>Checking Points</b>	1 mark for Definition and 3 marks for 3 factors= <b>Total 4 marks</b>
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**ii.**

Given mass = 5.85g

Molar mass of KI= 39+127= 166 a.m.u

Volume of solution= V= 0.125 dm<sup>3</sup>

Find= Molarity ?

Number of moles of KI =  $\frac{\text{Given mass}}{\text{Molar mass}}$

= 5.85/166= .035 moles

Molarity (M)= No of moles of solute/Volume of solution in dm<sup>3</sup>

.035/0.125 = 0.28 M

<b>Checking Points</b>	1 mark for Data and 1 mark for formula 1 for answer = <b>Total 3 marks</b>
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## Q-5

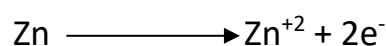
- i. Principle behind the Daniel Cell is redox reaction. Oxidation and reduction reactions occur in this process.

### Working:

The Zn metal has tendency to lose electrons more readily than copper. As a result oxidation takes place at Zn-electrode. The electrons flow from Zn-electrode through the external wire in a circuit to copper electrode.

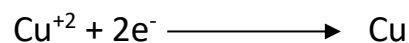
### At Anode:

Anode is negatively charged and oxidation of Zn takes place by loss of  $e^-$  to form  $Zn^{+2}$  ions.

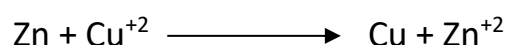


### At Cathode:

Cathode is positively charged and reduction of  $Cu^{+2}$  takes place by gain of  $2e^-$  to form Cu.



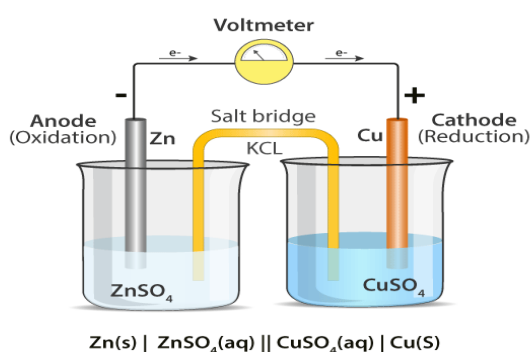
### Redox Reaction:



### Construction:

It consists of two cells, each called as half cell connected externally by a salt bridge. In each of the half cell, an electrode is dipped in 1M solution of its own salt and connected through a wire to an external circuit.

The left half of cell consists of an electrode of zinc metal dropped in 1M solution of  $ZnSO_4$ . The right half cell is a copper electrode dipped in 1M solution of  $CuSO_4$ . Salt bridge is a U-shaped glass tube. It consists of saturated solution of strong electrolyte (KCl) supported by a jelly type material. The ends of the U-tube are sealed with a porous material like glass wool. The function of the salt bridge is to keep the solutions of two half cells neutral by providing a pathway for migration of ions across the cells.



Checking  
Points

1 mark for Principle 1 for working 1 for construction and 1 mark for diagram = **Total 4 marks**

**ii. Inertness of Noble Metals:**

- i. Noble metals are those metals which resist oxidation and corrosion in moist air.
- ii. Chemically noble metals are relatively inert in nature and found free in nature. They are valuable because of their inertness.
- iii. Rhodium (Rh), Palladium (Pd), Silver (Ag), Platinum (Pt) and Gold (Au) are noble metals. They are very useful metals in metallurgy, high technology and ornamentation (jewelry etc)

<b>Checking Points</b>	1 mark for 3 points each = <b>Total 3 marks</b>
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