ZIAUDDIN UNIVERSITY
EXAMINATION BOARD

RESOURCES FOR

"SSC-I CHEMISTRY"

ZUEB EXAMINATIONS 2021

PREFACE:

The ZUEB examination board acknowledges the serious problems encountered by the schools and colleges in smooth execution of the teaching and learning processes due to sudden and prolonged school closures during the covid-19 spread. The board also recognizes the health, psychological and financial issues encountered by students due to the spread of covid-19.

Considering all these problems and issues the ZUEB Board has developed these resources based on the condensed syllabus 2021 to facilitate students in learning the content through quality resource materials.

The schools and students could download these materials from www.zueb.pk to prepare their students for the high quality and standardized ZUEB examinations 2021.

The materials consist of examination syllabus with specific students learning outcomes per topic, Multiple Choice Questions (MCQs) to assess different thinking levels, Constructed Response Questions (CRQs) with possible answers, Extended Response Questions (ERQs) with possible answers and learning materials.

ACADEMIC UNIT ZUEB:

2. Constructed Response Questions (CRQs)

HOW TO ATTEMPT CRQs:

- Write the answer to each Constructed Response Question/ERQs in the space given below it.
- Use black pen/pencil to write the responses. Do not use glue or pin on the paper.

SECTION B (SHORT ANSWER QUESTIONS)

1. Define chemistry. Name few branches of chemistry?

S.NO	CRQ	ANSWER	CL	DL
1.	Define chemistry. Name few branches of chemistry	**CHEMISTRY:** A branch of science that deals with the composition, structure and properties of matter, and chemical changes involve in it. **BRANCHES OF CHEMISTRY:** The main branches of chemistry are: **1) Physical chemistry** **2) Organic chemistry** **3) Inorganic chemistry** **4) Analytical chemistry** **5) Bio chemistry** **6) Industrial chemistry** **7) Nuclear chemistry** **8) Environmental chemistry** **9) Polymeric chemistry**	**U/R**	**E**
2.	Calculate the molecular mass (in a.m.u) of each of the following substances. • H20 • C2H6	**.18** **.30**	**K/A**	**M**

<table>
<tr><td></td><td>• H2O2
• C2H60</td><td>.34
.46</td><td></td><td></td></tr>
<tr><td>3.</td><td>The formula for rust is Fe203. How many moles of Fe are present in 30g of rust?.</td><td>0.18</td><td>K/A</td><td>E</td></tr>
<tr><td>4.</td><td>State 3 differences between covalent bond and coordinate covalent bond</td><td>
<table>
<tr><th><u>COVALENT BOND</u></th><th><u>CO-ORDINATE COVALENT BOND</u></th></tr>
<tr><td colspan="2">1. Definition</td></tr>
<tr><td>It is formed by the mutual sharing of electrons between atoms.</td><td>The co-ordinate covalent bond is formed by one sided sharing of electrons.</td></tr>
<tr><td colspan="2">2. Bond Formation</td></tr>
<tr><td>Bond is formed between the similar or dissimilar atoms, when electrons are mutually shared.</td><td>Bond is formed between two unlike atoms, one having an electron pair available for sharing and other must accept that electron pair.</td></tr>
<tr><td colspan="2">3. Nature of Bond</td></tr>
<tr><td>Bond may be polar or non-polar</td><td>Bond is always polar</td></tr>
<tr><td colspan="2">4. Character</td></tr>
<tr><td>Bond is associated with only covalent character because there is no electron transfer.</td><td>Bond is associated with the ionic and covalent character because of partial transfer of electrons.</td></tr>
<tr><td colspan="2">5. Denotation</td></tr>
<tr><td>Single pair is denoted by (—), double pair is denoted by (═) and for triple pair of electrons (≡)</td><td>It is denoted by an arrow (→)</td></tr>
<tr><td colspan="2">6. Solubility</td></tr>
<tr><td>They are usually insoluble in water</td><td>They are sparingly soluble is water.</td></tr>
</table>
</td><td>K/R</td><td>M</td></tr>
<tr><td>5.</td><td>Calculate the molarity of a solution containing 16g glucose per 300ml solution.</td><td>0.296M</td><td>K/A</td><td>M</td></tr>
<tr><td>6.</td><td>Define PH of the solution and calculate the pH of 0.001 M of HCL.</td><td>P_H :
Negative logarithm of concentration of H_+ (hydrogen positive ion) is known as P_H. It is also called power of hydrogen ion.

3</td><td>K/A</td><td>E</td></tr>
</table>

7.	State Faraday's First and Second law of electrolysis	**INTRODUCTION:** Michael Faraday's in 1833, studied the quantitative aspect of electrolysis. He discovered that there exists a definite relationship between the amount of current passed through a solution and the quantity of the substance decomposed or produced by this current. **STATEMENT:** The amount of substance either deposited or liberated at an electrode in an electrolytic cell, during electrolysis is directly proportional to the amount of electricity that passes through the cell. **FARADAY'S 2ND LAW OF ELECTROLYSIS** **STATEMENT:** The masses of different substance deposited or liberated by the same quantity of electricity are proportional to the chemical equivalents of the substances.	**K/R**	**M**
8.	What is meant by Mole? Calculate the number of moles in 96g of SO2.	The **mole** is the unit of measurement for amount of substance in the International System of Units (SI). It is defined as exactly 6.02214076×10^{23} particles, which may be atoms, molecules, ions, or electrons. **1.5**	**K/A**	**E**
9.	Write down any three chemical properties of acids.	**Chemical Properties of Acids:** **1.** They react with bases to form salt and water. $HNO_3 + KOH \longrightarrow KNO_3 + H_2O$ $H_2SO_4 + 2NaOH \longrightarrow Na_2SO_4 + 2H_2O$ **2.** Acids react with carbonates and bicarbonates to form salt, water and CO2 gas. $CaCO_3 + 2HCl \longrightarrow CaCl_2 + H_2O + CO_2$ $NaHCO_3 + HCl \longrightarrow NaCl + H_2O + CO_2$ **3.** Acids react with oxides and hydroxides of metals, forming salt and water. $FeO + 2HCl \longrightarrow FeCl_2 + H_2O$ $Fe(OH)_3 + 3HCl \longrightarrow FeCl_3 + 3H_2O$ **4.** Acids react with certain metals, such as (Zn, Mg and Fe) to produce hydrogen gas. $Zn + 2HCl \longrightarrow ZnCl_2 + H_2$	**K/R**	**M**

10.	Define Ionic bond. Describe the mechanism of formation of NaCl.	**ELECTROVALENT BOND OR IONIC BOND:** A German chemist ‗W.Kossel' introduced the idea of ionic bond in 1916. He stated as: *"The bond which is formed by the complete transfer of electrons from one atom to another is called electrovalent bond."* **FORMATION OF NaCl:** In the formation of NaCl, an atom of sodium (Na) transfers one electron from its valence shell and become positive sodium ion (Na^+) and an atom of chlorine gains that one electron to complete its octet and becomes chloride negative ion (Cl^-). $\underset{2,8,1}{Na} \longrightarrow \underset{2,8}{Na^+} + e^-$ $\underset{2,8,7}{Cl} + e^- \longrightarrow \underset{2,8,8}{Cl^-}$ $Na^+ + Cl^- \longrightarrow Na^+Cl^-$ The attraction that binds (Na^+) and (Cl^-) ions together is called electrovalent bond and the compound (NaCl) is called electrovalent compound or ionic compound.	**K/A**	**E**
11.	Balance the following Chemical equations by using co-efficient: i) N2+H2 → NH3 ii) CH4 + O2 → CO2+ H2O iii) KNO3 → KNO2 +	**N2+3H3 → 2NH3** **CH4 +2O2 → CO2+2H2O**	**K/A**	**M**
12.	Find out Protons and Neutrons present in the following atoms 7N 15 17Cl37 92U 235	**Nitrogen:** **7 Protons** **8 Neutrons** **Chlorine:** **17 Protons** **20 Protons** **Uranium:** **92 Protons** **143 Neutrons**	**K/A**	**E**
13.	What are Transition Elements? Describe any two general characteristics of these elements.	These are metals. In these elements, besides the valence shell or penultimate shell is also incomplete. In chemical reactions they show more than one valencies. i.Outer transition elements i.Inner transition elements. Inner transition elements are further divided into two series called: i.Lanthanide series i.Actinides series	**K/R**	**E**
14.	Calculate the molarity of a solution containing 4 grams of Sodium Hydroxide (NaOH) in 100 ml solution.	**1 Molar**	**K/A**	**E**

15.	Define both kinds of Displacement reaction with an appropriate chemical equation as example for each	**DISPLACEMENT REACTION:** The process in which single element or a radical in a compound is displaced by another element or a radical is known as displacement reaction. For Example; $Cu + ZnSO_4 \longrightarrow CuSO_4 + Zn$ **DOUBLE DISPLACEMENT REACTION:** Two compounds exchange their radicals, so that two new compounds are formed. The process in which both the elements or a radical in a compound is displaced by each other or exchanging their radicals. For Example; $HCl + AgNO_3 \longrightarrow HNO_3 + AgCl$	**K/R**	**M**
16.	What is diffusion? State Graham's law of diffusion of gases	DIFFUSION: ***"The spreading of the molecules of the substance through medium is called diffusion."*** **OR** ***"The intermixing of substances to form a homogenous solution is called diffusion."*** **DIFFUSION OF GASES:** When a sample of a gas is set free in container, its molecules very quickly spread through out the container. For example, molecule of perfume spread throughout the room. **GRAHAM'S LAW OF DIFFUSION:** A Scottish chemist, Thomas Graham studied the rate of diffusion of different gases and formulated a law. **STATEMENT** ***"The rate of diffusion of a gas is inversely proportional to the square root of the density of the gas."*** $r \propto \frac{1}{\sqrt{d}}$ where, **r** is rate of diffusion **d** is density of a gas In other words, lighter gases can diffuse faster than heavier gases.	**K/R**	**M**
17.	Write down any three chemical properties of BASE.	**Chemical Properties of Bases:** **1.** They react with acids to form salt and water.	**K/R**	**E**

		$KOH + HNO_3 \longrightarrow KNO_3 + H_2O$ $2NaOH + H_2SO_4 \longrightarrow Na_2SO_4 + 2H_2O$ **2.** Bases dissolve certain metals and non-metals and liberate hydrogen gas. $2Al + NaOH + 2H_2O \longrightarrow 2NaAlO_2 + 3H_2$ **3.** Bases precipitate out heavy metal ions from their salt solutions. $FeCl_3 + 3NaOH \longrightarrow Fe(OH)_3 + 3NaCl$ **4.** Bases react with ammonium salts to form salt, water and ammonia gas. $NH_4Cl + NaOH \longrightarrow NaCl + H_2O + NH_3$		
18.	What is the modern periodic law. Name the elements of the Lithium family	In 1914, Moseley, a British physicist arranged the elements in order of their increasing atomic numbers. In this periodic table, elements having similar properties are repeated at regular intervals. *"The physical and chemical properties of all elements are the periodic functions of their atomic numbers".* This is called modern periodic law in modern periodic table, the vertical columns of elements are called groups and horizontal rows of elements are called periods. *Lithium family includes Li, Na, K, Rb, Cs and Fr.*	**K/R**	**E**