ZIAUDDIN UNIVERSITY
EXAMINATION BOARD

EXAMINATION MATERIAL OF ZUEB 2021-2022

GRADE: XI **SUBJECT: CHEMISTRY**

SECTION # C

DETAILED ANSWER QUESTIONS

CHAPTER # 01 FUNDAMENTAL CONCEPT OF CHEMISTRY

TOPICS:	**1.9** Limiting reactant
	1.5 Empirical and molecular formula

1. Take the reaction: **$2NH_3 + 5/2\ O_2 \longrightarrow 2NO + 3\ H_2O$.** In an experiment**, 3.25** g of NH_3 are allowed to react with **3.50** g of O_2.
   - **a.** Which reactant is the limiting reagent?
   - **b.** How many grams of **NO** are formed?

2. A compound with a molar mass of **544.0 g/mol** is made up of **26.5** grams Carbon, **2.94** grams Hydrogen, and **70.6** grams Oxygen. What is its empirical and molecular formula?

OR

3. The percent composition of an unknown organic substance is **75.42 %** Carbon, **6.63 %** Hydrogen, **8.38 %** Nitrogen, and **9.57 %** Oxygen. If its molar mass is **334.0 g/mole** what is its empirical and molecular formula?

CHAPTER # 03 ATOMIC STRUCTURE

TOPICS:	**3.2** Crooke's tube experiment
	3.9 Rutherford's Atomic Model
	3.11 Bohr's Atomic model
	3.12 Bohr's theory & hydrogen atom

1. Write down the postulates of Bohr's atomic model & derive expression for Radius of nth orbit of an hydrogen atom.

OR

2. Derive the relation for energy of nth orbit of an hydrogen atom.

$$r = \frac{n^2 h^2}{4\pi^2 mZe^2}$$

3. Derive expression for the frequency and wave number of radiation when the electron jumps from higher orbit **(n_2)** to the lower orbit **(n_1)** . Given.

$$\mathbf{E = \frac{-2\pi^2\, mZ^2\, e^4}{n^2\, h^2}}$$

4. Describe the discovery of electron by Crook's tube experiment.

OR

5. Explain the existence of nucleus by Rutherford atomic model with its postulates.

6. Calculate the wavelength of an electron when it jumps from **3rd** orbit to Lyman series**.**
(R_H = 109678 cm^{-1})

CHAPTER # 04 CHEMICAL BONDING

TOPICS:	**4.2** Electrovalent bond or ionic bond
	4.9 Hybridization
	4.10 Shape of molecule

1. Define Hybridization? Explain **SP^3** hybridization with an example of methane also draw the orbital structure of methane.

OR

2. Describe the shape of **H_2O** OR **$BeCl_2$** on the basis of HOM & VSEPR theory.

3. Define ionic bond. Explain the formation of NaCl involves energy changes.

CHAPTER # 05 CHEMICAL ENERGETICS

TOPICS:	**5.2** First law of thermodynamic

1. State & explain first law of thermodynamic with pressure-volume equation and prove that **$\Delta q = \Delta H$**

CHAPTER # 07 SOLUTION & ELECTROLYTES

TOPICS:	**7.4** Theory of ionization
	7.9 Ionic Balance Equation

1. Write down the main postulates of Arrhenius theory of ionization.

2. Write difference between oxidation **&** reduction reaction. Balance the redox equation by ion electron method.

$MnO_4^{-1} + Cl^{-1} \longrightarrow Mn^{+2} + Cl_2$ **(Acidic)**

$Fe^{+2} + Cr_2O_7^{-2} \longrightarrow Fe^{+3} + Cr^{+3}$ **(Basic)**