Mid-West University

Examinations Management Office

Final Examinations -2078

Bachelor level/ B.Sc/ 1st Semester — Full Marks : 60
Time: 3hrs — Pass Marks.: 30

Subject : Fundamental of Chemistry I (CHEM415/315)

Candidates are required to give their answer in their own words as far as practicable. The figures in the margin indicate full marks.

Inorganic Chemistry

Very short Questions **(5×2=10)**

1) Define de-Broglie equation.
2) Write the quantum number of 3d electron and 17th electron of potassium atom.
3) Define nuclear fusion with suitable example.
4) What is solubility product?
5) What is electrolytic reduction?

OR

Discuss Mulliken scale of electronegativity.

Long questions **(2×5=10)**

6) Define common ion effect. How does it help in group separation for the qualitative analysis of metal ion (explain in brief with suitable example)?
7) Derive Schrodinger wave equation. Write the shape of p-orbital.

OR

Write short notes on:

a. Radioactivity b)Electron affinity

Organic Chemistry

Very short Questions **(5×2=10)**

1) Differentiate between exothermic and endothermic reaction.
2) Sketch diagram of staggered and eclipsed ethane in Andiron formula.
3) Write the formula of Ethyl magnesium bromide .What happens when it reacts with ammonia (NH_3)?
4) Show the two steps of Oxymercuration and Demercuration Reaction.
5) Which is more acidic- ethene or ethyne and Why?

OR

Calculate the % of expected isomers during monobromination of butane. The relative rates of substitution per 3^0, 2^0, 1^0 hydrogen are 1600:82:1.

Long questions **(2×5=10)**

6) What is E_1 reaction? Explain its kinetic, mechanism and orientation. **(5)**
7) What is halogenation? Explain the mechanism of halogenation of methane. **(1+4=5)**

OR

Identify the products of the following reactants. **(5)**

i) $(CH_3)_2C{=}CH_2 \xrightarrow{HCl}$ (A)

ii) $CH_2 = CH_2 \xrightarrow{Br_2/H_2O}$ (B)

iii) $CH_3CH{=}CH_2 \xrightarrow[THF]{Hg(OCOCH_3)}$ (C) $\xrightarrow[NaOH]{NaBH_4}$ (D)

iv) $CHBr_3 + Ag \xrightarrow[\Delta]{}$ (E)

Physical Chemistry

Very short Questions **(5×2=10)**

1) How errors are eliminated or minimize on chemical analysis?
2) Define the term an error. How they are classified?
3) Deduce Charles law from kinetic gas equation.
4) Calculate the root mean square velocity of CH_4 gas at NTP.
5) A rain drop is spherical in shape. Describe why it has a spherical shape.

OR

How the solids are classified on the basis of dominant bonds?

Long questions **(2×5=10)**

6) Derive the van der Waal equation for real gas. Starting from van der Waals equation, derive the value of critical volume and critical pressure.
7) Describe viscosity and co-efficient of viscosity. Describe the method for determining the viscosity of liquid by Ostwald's viscometer.

OR

What is meant by liquefaction of a gas? Explain Linde's method for liquefaction of gas.

THE END