

Mid-West University
Examinations Management Office
End Semester Examination 2081

Bachelor level/ B. Sc. / 1st Semester

Time: 3 hours

Subject: Fundamentals of Chemistry I (CHE415/315)

Full Marks: 60

Pass Marks: 30

Candidates are required to give their answer in their own words as far as practicable. The figures in the margin indicate full marks. Use separate answer sheet for Inorganic, Organic and Physical parts.

Inorganic Chemistry

Group-A

Long answer questions (attempt any two).

[2x5 = 10]

1. Derive Schrodinger's wave equation (time independent). Write its physical significance. (4+1)
2. Describe thermodynamics of reduction of metal by Ellingham diagram. (5)
3. Write in short about; (5x1)
 - a) de-Broglie equation
 - b) Ionization potential
 - c) Binding energy
 - d) Solubility product principle
 - e) Froth flotation process

Group-B

Short answer questions (attempt any five).

[5x2 = 10]

4. How Bohr theory of an atom is superior than Rutherford atomic theory?
5. Define quantum number? What is the quantum number of 19th electron of potassium atom?
6. What are isoelectronic ions? Arrange the given chemical species in ascending order based on their size. Na^+ , O^{2-} , N^{3-} , Al^{3+} , Mg^{2+}
7. What are the reduction methods for converting metal ore to metal?
8. Write in short about common ion effect?
9. Differentiate between nuclear fission and fusion reaction?

Organic Chemistry

Group-A

Long answer questions (attempt any two)

[2x5 = 10]

1. Briefly explain the mechanism of halogenations of alkane. Compare and discuss the stability of various types of alkyl halide on the basis of homolytic bond dissociation energy. (4+1)
2. Define dehydrohalogenation. Explain the kinetics, mechanism, stereochemistry and reactivity of E_2 reaction.
3. Write short note on (Any two)
 - a) Markovnikov's rule
 - b) Hydroboration-oxidation
 - c) Ozone layer depletion