

Mid-West University
Examinations Management Office

Birendranagar, Surkhet

End Semester (Alternative/Physical) Examinations -2078

Bachelor level/ B.Sc /6th Semester

Time: 3hrs

Subject : Advanced Chemistry IV (CHE463)

Full Marks : 60

Pass Marks : 30

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

Inorganic Chemistry

Attempt all question

[2X10=20]

- Define coordination compounds? How it differs from double salt? Differentiate between inner and outer orbital complex. Write the IUPAC name of following compound
 - $\text{Cr}(\text{NH}_3)_4(\text{NO}_2)\text{Cl}]\text{NO}_3$
 - cis- $[\text{Co}(\text{en})_2\text{Cl}_2]\text{Cl}$
 - Write the postulates of crystal field theory. Explain crystal field stabilization energy? List the factors affecting stability of complex salt. **[5]**
- What is EAN rule? What are the main postulates of Werner coordination theory? Write the isomerism in $\text{Cr}(\text{en})_3^{3+}$ **[5]**
 - What are the main assumptions of valence bond theory? Write its limitation? What is spectrochemical series? **[5]**

Organic Chemistry

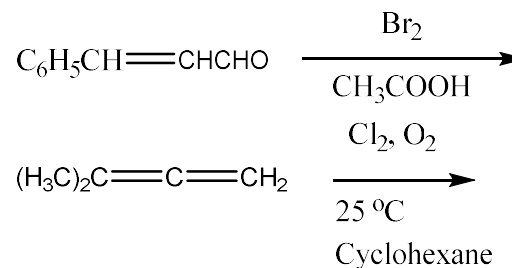
Attempt all question

[2X10=20]

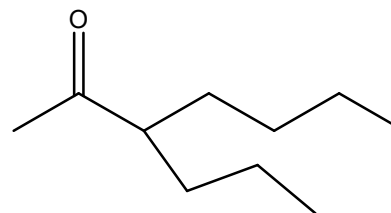
- What are active methylene compounds? Give two examples. Define and give example of enolization. Give examples of any two C-C bond forming reactions. **[5]**
 - What are Enolate ions? Illustrate the formation of Enolate ions. What are kinetic enolates and thermodynamic enolates? **[5]**

OR

- a) Predict the major products in the given reactions: **[5]**



Outline the mechanism of Wittig reaction. How would you synthesize the following molecule by acetoacetic ester synthesis?



- Give a detail account of Aldol condensation (acid and base catalyzed both) **[5]**
- What is Darzen's condensation? A method of synthesizing α,β -unsaturated aromatic carboxylic acids (cinnamic acid and its derivatives and analogues) by reacting aromatic aldehydes with carboxylic acid anhydrides in the presence of a basic catalyst such as sodium or potassium salts of carboxylic acids, carbonates of alkali metals or tertiary amines. Name the reaction by reading previous sentence. Also give an example of this reaction. Draw the structure of caryophyllene. Indicate the stereocenters in that structure. **[5]**
 - Give your acquaintance with
 - Friedel Craft acylation
 - Claisen Schmidt reaction

Physical Chemistry

Attempt all question

[2X10=20]

- What do you mean by entropy of mixing? What is reaction isotherm? State the third law of thermodynamics. What is its significance? **[5]**

- b) Define the term entropy. Show that total entropy increases in an irreversible process but remains constant in a reversible process. [5]

OR

- a) What is the physical significance of work function? Calculate the amount of heat supplied to Carnot cycle working between 27°C and 50°C if the work done is found to be 320J. Give the criteria of spontaneity in terms of entropy change. [5]
- b) Define entropy. Derive the relation of dependence of variable T and P on entropy of a system. [5]
6. a) Give the relation between K_p and K_c for a gaseous reaction. Prove that $(\partial (\Delta G/T)/\partial T)_P = -\Delta H/T^2$. Calculate the entropy change involved in the isothermal reversible expansion of 1 mole of an ideal gas from a volume of 2 lit. to 10 lit. at 27°C . [5]
- b) State write Gibbs Helmholtz equation. Derive Clapeyron equation. What are their applications? [5]

THE END