

Mid-West University  
**Examinations Management Office**

Birendranagar, Surkhet

**End Semester (Alternative/Physical) Examinations -2078**

Bachelor level/ B.Sc /4<sup>th</sup> Semester

Time: 3hrs

Full Marks : 60

Pass Marks : 30

**Subject : Fundamentals of Chemistry IV(CHE345)**

*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 the question**

**[2X10=20]**

- Write any two reasons of complex formation in transition elements. Differentiate between electronegativity and ionization potential. What is Ziegler -Natta catalyst? [5]
  - Show the structure of ferrocene. Describe the Werner's coordination theory. Write its limitations. [5]
- Write about the linkage isomerism with examples. Compare the compounds of Cu and Ni in brief. Write any two Chemical properties of TiO<sub>2</sub>. [5]
  - Give an example of stereoisomerism in coordination compounds. [5]

**Organic Chemistry**

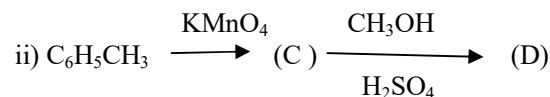
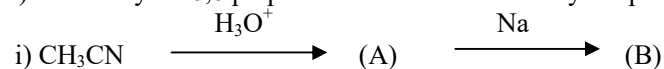
**Attempt all the question**

**[2X10=20]**

- Compare the boiling point of CH<sub>3</sub>COOH and CH<sub>3</sub>CH<sub>2</sub>OH. Discuss the basicity of 1<sup>o</sup>, 2<sup>o</sup>, 3<sup>o</sup> amines. Arrange these amines in increasing order of their basicity. [5]
    - Outline the synthesis of following compounds (2+2+2=6) [5]
      - CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>COOH from Diethyl malonate(COOC<sub>2</sub>H<sub>5</sub>CH<sub>2</sub>COOC<sub>2</sub>H<sub>5</sub>)
      - CH<sub>3</sub>CH<sub>2</sub>COCH<sub>3</sub> from Ethylacetate(CH<sub>3</sub>COCH<sub>2</sub>COOC<sub>2</sub>H<sub>5</sub>)
      - Malonyl urea from Diethyl malonate.
- OR**
- Is acetoacetic ester an active methylene compound? Why? What is benzidine rearrangement? How is primary amine prepared from ketone? [5]
  - Write the reaction of primary, secondary and tertiary amines with nitrous acid.

Explain in detail.

- What is coupling reaction? Show your familiarity with Fries rearrangement. [5]
  - How is nylon 6,6 prepared? Write its use. Identify the products (A),(B),(C),(D). [5]



**[5]**

**Physical Chemistry**

**Attempt all the question**

**[2X10=20]**

- What is meant by standard electrode potential? Write any two importance of standard electrode potential. Predict whether the reaction is feasible or not.  
 $2\text{Ag (s)} + \text{Zn}^{++} (\text{aq}) \leftrightarrow 2\text{Ag}^+ (\text{aq}) + \text{Zn (s)}$  Given that  $E^\circ \text{Ag}/\text{Ag}^+ = +0.8\text{V}$   $E^\circ \text{Zn}^{++}/\text{Zn} = -0.76\text{V}$ . [5]
  - What is Joule Thomson effect? Discuss briefly the Joule Thomson experiment. [5]

**OR**

- What is primary cell? Give an example of it. Why salt bridge is used on electrochemical cell? Define a) Intensive properties b) Extensive Properties. [5]
  - What is Nernst equation? Derive an expression for Nernst equation for measuring its EMF of a cell. What is its importance? [5]
- Define work function and free energy. Define the term entropy. What is its unit? What do you mean by electrochemical series? What are the applications of electrochemical series? [5]
    - Discuss the principle underlying the potentiometric titration. How would you titrate a solution of an acid base against a base? Write any two advantage of potentiometric titration. [5]

**THE END**