



# TAMIL NADU OPEN UNIVERSITY

Chennai - 15  
School of Sciences  
Department of Chemistry

## HOME ASSIGNMENT

Programme Code No : 2282  
Programme Name : M.Sc. Chemistry  
Course Code & Name : MCHEN - 11 & Organic Chemistry - I  
Batch : **AY 2021-22 [1<sup>st</sup> Year]**  
No. of Assignments : 3 [One Assignment for each 2 credits]  
Maximum Marks : 15 Marks [Average of total no. of Assignments]

### **ASSIGNMENT-1**

Max: 15 Marks

**Answer any ONE of the following three questions in 1000 words**

- 1) Describe the synthetic applications of DMP, CAN,  $Mn(OAc)_3$ ,  $NOCl$ ,  $BF_3$ , NBS,  $NaBH_4$  and  $LiAlH_4$ .
- 2) Discuss about the following reactions with suitable examples.
  - (i) Allenes
  - (ii) Spirane
  - (iv) Stereoselective synthesis
  - (v) Stereospecific synthesis
- 3) Write notes on the following with suitable examples.
  - (i) Retron & Synthons
  - (ii) Disconnection
  - (iii) Synthetic equivalents
  - (iv) Protection and Deprotection of functional groups

\*\*\*\*\*

### **ASSIGNMENT-2**

Max: 15 Marks

**Answer any ONE of the following three questions in 1000 words**

- 1) Describe about Aromaticity of heterocyclic compounds with examples.

- 2) Discuss the following reactions with suitable examples.
- (i) Hofmann degradation
  - (ii) Reformatsky reaction
  - (iii) Knoevenagel condensation
  - (iv) Benzoin condensation
  - (v) Cope elimination
- 3) Explain about the following reactions with suitable examples.
- (i) Sandmeyer reaction
  - (ii) Ullmann reaction
  - (iii) Wagner-Meerwein rearrangement
  - (iv) Chichibabin reaction
  - (v) Dienone-phenol rearrangement

\*\*\*\*\*

### **ASSIGNMENT-3**

**Max: 15 Marks**

**Answer any ONE of the following three questions in 1000 words**

- 1) Write notes on the synthetic applications of NBS, NaBH<sub>4</sub>, LiAlH<sub>4</sub>, DMP, CAN, Mn(OAc)<sub>3</sub>, NOCl and BF<sub>3</sub>.
- 2) Describe the following reactions with suitable examples.
- (i) Sandmeyer reaction
  - (ii) Chichibabin reaction
  - (iii) Ullmann reaction
  - (iv) Wagner-Meerwein rearrangement
  - (v) Dienone-phenol rearrangement
- 3) Write notes on the following with suitable examples.
- (i) Huckel's theory of aromaticity
  - (ii) Aromaticity of Benzenoid compounds
  - (iii) Homoaromaticity
  - (iv) Antiaromaticity
  - (v) Hammett Equation

\*\*\*\*\*



# TAMIL NADU OPEN UNIVERSITY

Chennai - 15

School of Sciences

Department of Chemistry

## HOME ASSIGNMENT

Programme Code No : 2282

Programme Name : M.Sc. Chemistry

Course Code & Name : MCHEN - 12 & Inorganic Chemistry - I

Batch : AY 2021-22 [1<sup>st</sup> Year]

No. of Assignments : 3 [One Assignment for each 2 credits]

Maximum Marks : 15 Marks [Average of total no. of Assignments]

### ASSIGNMENT-1

Max: 15 Marks

Answer any ONE of the following three questions in 1000 words

- 1) Describe the following with suitable examples.
  - (i) Lanthanide complexes as Shift reagents
  - (ii) 4f and 5f Orbital comparison
  - (iii) Magnetic and Spectral properties of Lanthanide complexes
- 2) Write notes on the following with suitable examples.
  - (i) Chelate effect
  - (ii) Spectrochemical Series of Ligands
  - (iii) Orgel Diagrams
  - (iv) Tanabe-Sugano diagrams
  - (v) Splitting of d orbitals
- 3) Explain about the Complementary/Non-complementary reactions, Racemisation reaction and Solvolytic reaction with examples.

\*\*\*\*\*

### ASSIGNMENT-2

Max: 15 Marks

Answer any ONE of the following three questions in 1000 words

- 1) Discuss in details about characteristics and electronic configuration of Lanthanides.

- 2) Describe the VB theory and VSEPR theory.
- 3) Write short notes on the following reactions with suitable examples.
  - (i) Reactions of coordinated ligands
  - (ii) Chelate effect
  - (iii) Marcus theory
  - (iv) Trans effect theory

\*\*\*\*\*

### **ASSIGNMENT-3**

**Max: 15 Marks**

**Answer any ONE of the following three questions in 1000 words**

- 1) Discuss in details about Hybridization and Structure of molecules.
- 2) Write notes on the characteristic features and electronic configuration of Actinides.
- 3) Describe the following with suitable examples.
  - (i) Linkage Isomerism
  - (ii) Prussian Blue and related structures
  - (iii) Hard and Soft ligands
  - (iv) Resolution of Optically active complexes

\*\*\*\*\*



## **TAMIL NADU OPEN UNIVERSITY**

**Chennai - 15  
School of Sciences  
Department of Chemistry**

### **HOME ASSIGNMENT**

Programme Code No : 2282  
Programme Name : M.Sc. Chemistry  
Course Code & Name : MCHEN - 13 & Physical Chemistry - I  
Batch : **AY 2021-22 [1<sup>st</sup> Year]**  
No. of Assignments : 3 [One Assignment for each 2 credits]  
Maximum Marks : 15 Marks [Average of total no. of Assignments]

### **ASSIGNMENT-1**

Max: 15 Marks

**Answer any ONE of the following three questions in 1000 words**

- 1) Discuss about the Theories of reaction rates.
- 2) Write notes on the following with suitable examples.
  - (i) Phase diagram for three component systems
  - (ii) Phase Transition classifications
  - (iii) One/Two pair partially miscible liquids
- 3) Explain about a particle in a box.

\*\*\*\*\*

### **ASSIGNMENT-2**

Max: 15 Marks

**Answer any ONE of the following three questions in 1000 words**

- 1) Describe about the following
  - (i) Phase, Component, and Degrees of Freedom
  - (ii) Schrodinger wave equation.
- 2) Write notes on the following with suitable examples.
  - (i) Orthogonization and Normality
  - (ii) Harmonic Oscillators
  - (iii) Rigid Rotor
  - (iv) Black body radiation
  - (v) Photoelectric effect
- 3) Discuss about the following with suitable examples.
  - (i) Free energy
  - (ii) Chemical potential
  - (iii) Partial molar quantities
  - (iv) Reversible and Irreversible processes
  - (v) Gibbs-Duhem Equation

\*\*\*\*\*

### **ASSIGNMENT-3**

Max: 15 Marks

**Answer any ONE of the following three questions in 1000 words**

- 1) Describe the following with suitable examples.

- (i) Butler-Volmer equation
  - (ii) Over potentials
  - (iii) Tafal equation
  - (iv) Debye- Huckel limiting law
  - (v) Double layers
- 2) Explain about the Phase diagrams. Give phase diagrams for H<sub>2</sub>O and CO<sub>2</sub>.
- 3) Discuss the following.
- (i) Activated Complex Theory
  - (ii) Steady State Theory
  - (iii) Lindmann's theory of Unimolecular reaction
  - (iv) Transition State Theory

\*\*\*\*\*



## TAMIL NADU OPEN UNIVERSITY

Chennai - 15  
School of Sciences  
Department of Chemistry

### HOME ASSIGNMENT

Programme Code No : 2282  
 Programme Name : M.Sc. Chemistry  
 Course Code & Name : MCHEN - 14 & Analytical and Environmental Chemistry  
 Batch : **AY 2021-22 [1<sup>st</sup> Year]**  
 No. of Assignments : 3 [One Assignment for each 2 credits]  
 Maximum CIA Marks : 15 Marks [Average of total no. of Assignments]

### ASSIGNMENT-1

Max: 15 Marks

**Answer any ONE of the following three questions in 1000 words**

- 1) Discuss about the principle and instrumentations of UV-Vis and Mass spectroscopy.
- 2) Describe the following with suitable examples.
  - (i) Shift reagents
  - (ii) Chemical shift, Coupling constants & Peak area

- (iii) Spin-spin coupling
  - (iv) Double resonance techniques
- 3) Describe the following.
- (i) Potentiometry
  - (ii) Coulometry
  - (iii) Amperometry
  - (iv) Biosensors

\*\*\*\*\*

### **ASSIGNMENT-2**

**Max: 15 Marks**

**Answer any ONE of the following three questions in 1000 words**

- 1) Explain about the following.
- (i) ORD curves
  - (ii) Principles of ORD & CD
  - (iii) Octant rule
  - (iv) Cotton effect & Curves
  - (v) Circular birefringence
- 2) Describe about Paper, Thin Layer and High Performance Liquid Chromatography.
- 3) Write short notes on storage and handling of Carcinogenic, Poisonous, Easily vaporisable and Inflammable chemicals.

\*\*\*\*\*

### **ASSIGNMENT-3**

**Max: 15 Marks**

**Answer any ONE of the following three questions in 1000 words**

- 1) Explain about the principle and instrumentation of IR spectroscopy.
- 2) Discuss in details about the principle and instrumentation of NMR spectroscopy.
- 3) Write notes on the following with suitable examples.
- (i) Retro Diels-Alder reaction
  - (ii) Metastable ion & isotopic ion
  - (iii) Parent ion & Base peak
  - (iv) McLafferty rearrangement

\*\*\*\*\*



# TAMIL NADU OPEN UNIVERSITY

Chennai - 15

School of Sciences

Department of Chemistry

## HOME ASSIGNMENT

Programme Code No : 2282

Programme Name : M.Sc. Chemistry

Course Code & Name : MCHEN - 15 & Chemistry of Bio-molecules and Green Chemistry

Batch : **AY 2021-22 [1<sup>st</sup> Year]**

No. of Assignments : 3 [One Assignment for each 2 credits]

Maximum CIA Marks : 15 Marks [Average of total no. of Assignments]

### **ASSIGNMENT-1**

Max: 15 Marks

**Answer any ONE of the following three questions in 1000 words**

1) Explain about the following.

- (i) Anaesthetic
- (ii) Antipyretic
- (iii) Anti-inflammatory
- (iv) Pesticides
- (v) Analgesic

2) Write about the reproductive Hormones

3) Describe about the Definition, Occurrence and Isolation of Alkaloids.

\*\*\*\*\*

### **ASSIGNMENT-2**

Max: 15 Marks

**Answer any ONE of the following three questions in 1000 words**

1) Discuss the following compounds with examples.

- (i) Anti-inflammatory
- (ii) Analgesic
- (iii) Anaesthetic
- (iv) Pesticides
- (v) Antipyretic



- 2) Discuss in details about the Fertilizers.
- 3) Explain about the synthesis of Cholesterol and Estrone.

\*\*\*\*\*

### **ASSIGNMENT-3**

Max: 15 Marks

**Answer any ONE of the following three questions in 1000 words**

- 1) Describe about the classification of Amino acids.
- 2) Explain about the following compounds
  - (i) Santonin
  - (ii) Carotenoid
  - (iii) Citrol
  - (iv) Terpinol
- 3) Discuss in details about the Petrochemicals.

\*\*\*\*\*



## **TAMIL NADU OPEN UNIVERSITY**

Chennai - 15

School of Sciences

Department of Chemistry

### **HOME ASSIGNMENT**

Programme Code No : 2282

Programme Name : M.Sc. Chemistry

Course Code & Name : MCHEN-16 & Polymer Chemistry

Batch : **AY 2021-22 [1<sup>st</sup> Year]**

No. of Assignments : 3 [One Assignment for each 2 credits]

Maximum CIA Marks : 15 Marks [Average of total no. of Assignments]

\*\*\*\*\*

### **ASSIGNMENT-1**

Max: 15 Marks

**Answer any ONE of the following three questions in 1000 words**

- 1) Explain about the following.
  - (i) Electroluminescent polymers

- (ii) Biodegradable polymers
  - (iii) Biomedical polymers
- 2) Write notes on the stereoisomerism in polymer molecules.
- 3) Write notes on the following.
- (i) Functional polymers
  - (ii) Fire retarding polymers
  - (iii) Commercial polymers

\*\*\*\*\*

### **ASSIGNMENT-2**

Max: 15 Marks

**Answer any ONE of the following three questions in 1000 words**

- 1) Discuss in details about the classification of Polymers.
- 2) Explain about the following
- (i) Number Average Molecular Weight ( $M_n$ )
  - (ii) Weight Average Molecular Weight ( $M_w$ )
  - (iii) Viscosity Average Molecular Weight
- 3) Describe in details about the analysis and testing of polymers.

\*\*\*\*\*

### **ASSIGNMENT-3**

Max: 15 Marks

**Answer any ONE of the following three questions in 1000 words**

- 1) Discuss about the following.
- (i) Electrically conducting polymers
  - (ii) Natural polymers
  - (iii) Bio polymers
- 2) Explain in details about the techniques of polymerisation.
- 3) Describe the following
- (i) Commercial polymers
  - (ii) Polymer blend
  - (iii) Polyelectrolytes

\*\*\*\*\*