



11523

B.Sc. V Semester Degree Examination, Nov./Dec. 2016
Paper No. – 5.1 : CHEMISTRY

Time : 3 Hours

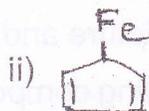
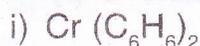
Max Marks : 80

- Instructions :** 1) Question paper has **four** Sections. **All** the Sections are **compulsory**.
2) Answer for **all** Sections should be written in the **same** answer book.

SECTION – A
(Inorganic, Organic and Physical)

1. Answer **any ten** of the following : (10×2=20)

- a) What are organoaluminium compounds ? Give examples.
b) Write the IUPAC names of the following compounds :



- c) Define nitrogen fixation.
d) What is the role of Ca^{2+} ion in biological process ?
e) Write the applications of silicones.
f) Give one method of synthesis of pyrrole.
g) Give the synthesis of organo zinc compounds.
h) What are thioethers ? Give examples.
i) How sulphaguanidine is prepared ?
j) What are the vibrations involved in IR spectroscopy ?
k) State Kohlrausch's law.
l) Define conductance and molar conductance.
m) Specific conductance of saturated solution of AgCl after subtracting specific conductance of water is $2.28 \times 10^{-4} \text{Sm}^{-1}$. Calculate solubility of AgCl.
($\lambda^{\circ} \text{mAgCl} = 138.0 \times 10^{-4} \text{Sm}^2 \text{mol}^{-1}$)
n) What are oscillatory reactions ? Give examples.
o) State law of mass action.

P.T.O.



SECTION – B
(Inorganic)

2. Answer **any two** of the following : (2×4=8)
- Discuss the bonding in organoaluminium compounds.
 - Explain the biological role of myoglobin and haemoglobin.
 - Discuss the general properties of inorganic polymers.
3. Answer **any two** of the following : (2×6=12)
- Describe the structure and applications of organolithium compounds.
 - Discuss the structure of metalloporphyrins.
 - Explain the methods of preparation structure and applications of phosphonitryls.

SECTION – C
(Organic)

4. Answer **any two** of the following : (2×4=8)
- Discuss the molecular orbital picture and aromatic character of pyridine.
 - Calculate the λ_{\max} for the following compounds.
 - 
 - 
 - Write the chemical reactions of organolithium compounds.
5. Answer **any two** of the following : (2×6=12)
- Explain the skraup synthesis and electrophilic substitution reactions of quinoline.
 - Discuss the preparation and chemical reactions of thiols.
 - Discuss the principle and measurement of uv spectroscopy.

SECTION – D
(Physical)

6. Answer **any two** of the following : (2×4=8)
- Explain the relation between specific conductance and equivalent conductance.
 - Describe Brusselator model of oscillatory reactions.
 - Explain application of Clausius-Clapeyron equation.
7. Answer **any two** of the following : (2×6=12)
- Explain ionic mobility and ionic conductance.
 - Explain originator model of oscillatory reactions.
 - Explain Van't-Hoff reaction isotherm.



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Paper – 5.2 : CHEMISTRY

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- Instructions :** 1) Question Paper has **four** Sections. **All** Sections are **compulsory**.
2) Answer for **all** Sections should be written in the **same** answer book.

SECTION – A

(Inorganic, Organic and Physical)

1. Answer **any ten** of the following : (10×2=20)
- What are chelate ligands ? Give examples.
 - What is meant by crystal field stabilization energy ?
 - Give the difference between weak field and strong field ligand.
 - Write the IUPAC names of the following complexes
 - $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$
 - $[\text{PtCl}_4(\text{NH}_3)_2]$.
 - Write the significances of organic reagents inorganic analysis.
 - Give the classification of carbohydrates with examples.
 - What are anomers ? Give example.
 - What are terpenoids ? Give example.
 - Write the structure of coniine and atropine.
 - Write the structure of Vitamin A and Vitamin C.
 - What are photochemical reactions ? Give examples.
 - Define quantum yield.
 - What is meant by polarization ?
 - Define optical activity.
 - What are complex reactions ?

P.T.O.



SECTION – B
(Inorganic)

2. Answer **any two** of the following : (2×4=8)
- Explain the geometrical isomerism in complexes of coordination number-4.
 - Explain the Sidgwick's theory of E.A.N. rule with examples.
 - Discuss the preparation, properties and uses of DMG.
3. Answer **any two** of the following : (2×6=12)
- Explain the types of ligands with examples.
 - Explain the crystal field splitting of d-orbitals in octahedral complexes.
 - Write a note on oxine.

SECTION – C
(Organic)

4. Answer **any two** of the following : (2×4=8)
- How is glucose converted into fructose ?
 - Give the synthesis of α -terpeniol.
 - What are hormones ? Give the synthesis of adrenaline.
5. Answer **any two** of the following : (2×6=12)
- Discuss the cyclic structure of D-glucose.
 - Elucidate the structure of citral.
 - Discuss the classification and biological importance of hormones.

SECTION – D
(Physical)

6. Answer **any two** of the following : (2×4=8)
- Give differences between thermochemical and photochemical reactions.
 - Describe the theory of diamagnetism and paramagnetism.
 - Discuss the kinetics of parallel reactions.
7. Answer **any two** of the following : (2×6=12)
- How dipole moment is used for predicting the shapes of molecules of CO_2 and H_2O and BF_3 and NH_3 ?
 - Explain photosensitization process. Give example.
 - Discuss the kinetics of consecutive reactions.