MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
DEPARTMENT OF PHYSICS
Course Structure – Semester wise CBCS (w.e.f.2019-2020)

Class	**: B.Sc (Physics)**	**Part III**	**: Allied**
Semester	**: III**	**Hours**	**: 04**
Sub code	**: 18UCHA31**	**Credits**	**: 04**

ORGANIC CHEMISTRY

Course Outcomes

CO1 To gain knowledge about carbohydrates

CO2 To gain the basic knowledge of halogen compounds and dyes

CO3 To understand about the stereoisomerism and types of organic reactions

Unit – I CARBOHYDRATES

1. Carbohydrates – Definition – Classification – Mono saccharides – Properties and uses of glucose and fructose – Structure of glucose and fructose - Haworth structure – muta rotation – Conversion of glucose into fructose and vice versa.
2. Disaccharides – Sucrose – manufacture – Properties and uses – Structure – Distinction between glucose and fructose.
3. Poly saccharides – Starch and Cellulose(Structure only) – α-amylose – β-amylose – difference between these two.

Unit – II HALOGEN COMPOUNDS

1. Aliphatic halogen compounds – preparation properties and uses of ethyliodide chloroform, iodoform and carbon tetrachloride.
2. Aromatic halogen compounds – preparation properties and uses of benzoyl chloride and chloro benzene.
3. Mechanism of aliphatic substitution S_N1, S_N2 illustration with examples – differences – Saytzeff and Hofmann rules.

Unit – III DYES

Dyes – Definition – theory of colour and constitution – classification of dyes according to the structure and their mode of applications

1. Azodyes: Preparation and uses of methyl orange and Bismark brown.
2. Triphenyl methane dyes: Preparation and uses of malachite green and crystal violet
3. Vat dyes: Praparation and uses of Indigo only
4. Phthalein dyes: Preparation and uses of phenopthalein only

Unit – IV TYPES OF ORGANIC REACTIONS

1. Detection and estimation of nitrogen and halogens in organic compounds – empirical formula – molecular formula – structural formula – calculation of empirical formula and molecular formula from percentage composition.
2. Types of reactions: Substitution, addition, elimination – rearrangement and polymerization – Illustration with examples – Nucleophiles – Electrophiles: definition types and examples specific reactions involving these.

Unit – V STEREOISOMERISM

1. Stereoisomerism – Chiral centre, optical activity of compounds containing one or two chiral centres, R – S notation – diastereoisomers – racemisation – resolution.
2. Geometrical isomerism of maleic and fumaric acids – E – Z notation of geometrical isomers.

Text Book:

P.L. Soni, Text Book of Organic Chemistry, New Delhi (2008)

References:

1. B.S Bahl and Arun Bahl S. Chand, Advanced Organic Chemistry
2. B. Mehta and M. Mehta, Organic Chemistry (E.E. Edition, New Delhi (2010)
3. P.L. Soni and HM Chawla, Organic Chemistry 29th Edition, Sultan and Chand sons, New Delhi (2007).

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Course Structure – Semester wise CBCS (w.e.f.2019-2020)

Class	**: B.Sc (Physics)**	**Part III**	**: Allied**
Semester	**: IV**	**Hours**	**: 04**
Sub code	**: 18UCHA41**	**Credits**	**: 04**

INORGANIC CHEMISTRY

Course Outcomes

CO1 To have a basic knowledge in Periodic table

CO2 To understand the basic knowledge of C-13 and Nuclear Chemistry

CO3 To know about coordination compounds

Unit – I PERIODIC TABLE AND ATOMIC PROPERTIES

Modern periodic table – salient features – classification and characterization of s,p,d and f block elements – periodicity – cause – atomic properties – atomic radii and ionic radii – their periodic trends – ionization energy – factors determining ionization energy – periodic trends – electron affinity – periodic trends – electro negativity – factors determining electro negativity and their periodic trends – applications of electro negativity.

Unit – II CHEMICAL BONDING

V.B. Theory – Postulates of V.B Theory – Application to the formation of simple molecules like H_2 and O_2 – overlap of atomic orbitals – s-s, p-p and s-p overlap – principle of hybridization – sp, sp^2 and sp^3 hybridization – VSEPR theory. Molecular orbital theory –MO diagram of H_2, He_2, N_2, O_2 & F_2 molecules

Unit – III HYDRIDES AND OXIDES

1. Hydrogen – Isotopes of Hydrogen - ortho and para hydrogen – hydrides – definition, classification – examples.
2. Oxides – definition – classification – examples.
3. Water – Hardness of water – Industrial implications of hardness of water – estimation by EDTA Method (outline only) – Units of hardness of water

Unit – IV NUCLEAR CHEMISTRY

1. Composition of Nucleus – Nuclear forces- Mass defect – binding energy – Nuclear stability – comparison of Alpha, Beta and Gamma rays
2. Soddy's group displacement law – Illustration – law of radioactive disintegration

3. Nuclear Fission: Definition – Principle of atom bomb – Nuclear fusion – Definition – Principle of hydrogen bomb – Comparison of Nuclear Fission and Fusion – Radioactive isotopes — radiocarbon dating technique – Applications of radioactivity.

Unit – V CO ORDINATION COMPOUNDS

1. Definition – nomenclature-definition of various terms involved in coordination chemistry – Werner's theory – EAN rule – VB theory (outline only) – Nickel carbonyl – chelates.
2. Nitrogen compounds: Manufacture of ammonia and nitric acid – physic chemical principles involved in the manufacture of ammonia.

Text Book:

B.R. Puri, L.R. Sharma and KC Kalia, Principles of Inorganic Chemistry Mile Stone Publisher 31st Edition, New Delhi (2011-12).

References:

1. Puri, Sharma and Kalia, Principles of Inorganic Chemistry Mile Stone Publisher and Distributor, New Delhi (2009).
2. R.D. Madan S Chand, Modern Inorganic Chemistry band Co-Ltd., New Delhi (2012).
3. J.D. Lee, Wiley India, Concise Inorganic Chemistry 5th Edition, New Delhi (2009).

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Course Structure – Semester wise CBCS (w.e.f.2019-2020)

Class	**: B.Sc (Physics)**	**Part III**	**: Allied**
Semester	**: III & IV**	**Hours**	**: 02**
Sub code	**: 18UCHAP1**	**Credits**	**: 01**

VOLUMETRIC ANALYSIS (Practical)

Course Outcomes:

CO1 To enable the students to develop skill in Acidimetry and alkalimetry
CO2 To gain knowledge in Permanganometry
CO3 To know about the knowledge of Iodimetry

1. Estimation of Sodium Hydroxide
   (Na_2CO_3 X HCl X NaOH)
2. Estimation of Hydrochloric Acid
   ($H_2C_2O_4$ X NaOH X HCl)
3. Estimation of Oxalic Acid
   ($FeSO_4$ X KMnO4 X $H_2C_2O_4$)
4. Estimation of FAS
   ($FeSO_4$ x $KMnO_4$ X FAS)
5. Estimation of Ferrous Sulphate
   ($H_2C_2O_4$ X KMnO4 X FeSO4)
6. Estimation of KMnO4
   ($K_2Cr_2O_7$ X FAS X $KMnO_4$)
7. Estimation of Sodium Hydroxide
   ($KMnO_4$ X $H_2C_2O_4$ X NaOH)
8. Estimation of $K_2Cr_2O_7$
   ($KMnO_4$ X FAS X $K_2Cr_2O_7$)
9. Estimation of Na_2CO_3
   (NaOH X HCl X Na_2CO_3)
10. Estimation of Iodine
    ($KMnO_4$ x Thio x Iodine)

INTERNAL = 40 MARKS **EXTERNAL** = 60 MARKS