VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.

F. Y. B.Sc. Chemistry - Paper – I Semester- II

Effective from November 2013

Inorganic Chemistry & Physical Chemistry — Total Hrs. 30

UNIT-I (A) CONDUCTANCE AND IONIC EQUILIBRIA — 6 Hrs.

Electrical conductance, specific conductance, equivalent conductance and molar conductance, effect of dilution on concentration, cell constant and its determination, Ostwald's dilution law and its limitations, buffer solutions, acid and basic buffer actions, Numericals.

(B) THERMODYNAMICS — 4 Hrs.

Second law of thermodynamics (in detail), Carnot cycle and its efficiency, Entorpy concept : Change of entropy for reversible, isothermic, isobaric and isophoric processes. Entropy change for ideal gases, Nurnericals.

UNIT II : (A) CO-ORDINATION CHEMISTRY — 7 Hrs.

Shape of d-orbitals, Crystal Fields theory - Basic assumption, splitting of d-orbitals in octahedral, tetrahedral and square planar complexes, Definition of CFSE.

(B) SILVER — 3 Hrs.

Extraction of silver from Argentiferrous ore by cyanide ,pattinson and cupellation process, Purification of silver by Electrolysis, Hypo and Zirvogel's process, its properties and uses, Electroplating of silver and photography.

UNIT III : (A) CHEMICAL BONDING — 5 Hrs.

Molecular Orbital theory ; LCAO method, Bonding molecular orbital, anti Bonding molecular orbital and nonbonding molecular orbital, bond order, magnetic properties and molecular orbital energy level diagram of Heterodiatomic molecules : CO and NO, VSEPR theory.

(B) PHYSICAL PROPERTIES AND CHEMICAL CONSTITUTION — 5 Hrs.

Classification of physical properties,(additive, constitutive, colligative, additive constitutive), atomic volume, molar volume and chemical constitution Kopp’s law, Surface tension, drop number method , parachor, Viscosity , determination of viscosity – Ostwald viscometer method viscosity and chemical constitution with Numerical.

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F. Y. B.Sc. Chemistry - Paper – II Semester- II

Effective from November 2013

Organic Chemistry **Total Hrs. 30**

UNIT – I <u>Reaction mechanism :</u> **10 Hrs.**

(a) Homolylic and Heterolytic fission free radicals carbonium ions (carbocations) and carbanions reactive intermediates carbenes , arynes and nitrenes.
(b) Types of reagents, electrophiles nucleopheles .
(c) Eletromeric, inductive, conjugative effect.
(d) Types of reactions : Addition, substitution, elimination, rearrangments. Addition, and substitution with respect toelectrophilic and nucleophilic, SN_1 SN_2
(e) Mechanism of (i) addition reaction to alkenes and dienes (ii) substitution in benzene ringnitration , sulfonation, alky lation , acy laiion , halogenation., cyanohydrin formation and acetal formation,
(f) Mechanism of Perkin reaction, Hoffman bromamide and Cannizero's reaction.

UNIT – II (A) <u>Alkenes, dienes and alkynes</u> : **7 Hrs.**

(a) Alkenes : Nomenclature, method of preparation, properties and uses of ethylene and propylene Morkwonikoffs rule and Satytzeff rule, polymerization of ethylene styrene and vinyl chloride.
(b) Dienes : nomenclature, classification of dienes methods of formation of Butadiene chemical reactions 1,2 and 1,4 additions, Diel's – Aider reaction.
(c) Alkynes : nomenclature , methods of fonnation, chemical reactions, electrophilic and nucleophilic addition reactions if acetylene.

(B) <u>Oils and fats</u> : **3 Hrs.**

Natural fats, edible and industrial oils of vegetable origin, common fatty acids.Glycerides saponification determination of saponification value, acid value and iodine value of and oil.

UNIT-III **10 Hrs.**

(A) <u>Carbohydrates</u> :

Definition and classification structure of D – glucose and D – fructose Conversion of glucose to fructose and fructose to glucose.

(B) <u>IUPAC nomenlature of organic compounds</u>

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Semester- II

VOLUMETRIC EXERCISE

HNO_3	*NaOH*	*$H_2C_2O_4$, $2H_2O$*
H_2SO_4	$NaHCO_3$	HNO_3
$NaOH + Na_2CO_3$	HCl	
$Na_2CO_3 + NaHCO_3$	H_2SO_4	
$KMnO_4$	$H_2C_2O_4 + H_2SO_4$	NaOH
$KMnO_4$	$H_2C_2O_4$	KOH
$KMnO_4$	$FeSO_4$	$K_2Cr_2O_7$
$K_2Cr_2O_7$	$Fe\text{-}NH_4\text{-}SO_4$	$KMnO_4$
$H_2C_2O_4$	$KMnO_4$	$FeSO_4$
I_2	$Na_2S_2O_3$	$K_2Cr_2O_7$

N. B. Candidate should perform at least 6 volumetric exercises.

ORGANIC SPOTTING

Primary tests, Ignition test, Detection of Elements, Nature of the substance (solubility test), Functional group tests, C. T., Molecular formula, Structural formula & M. P./ B. P. of the given substance.

ACID – Benzoic, Phthalic acid, Succinic acid.

BASE – Aniline, p – Toluidine

PHENOL – Phenol, Resorcinol, a Naphthol, b Naphthol

NEUTRAL –

CARBOHYDRATE – Glucose , Fructose

KETONE – Acetone, Acetophenone

ESTER – Methyl salicylate, Methylacetate

ALCOHOL – Methanol , Ethanol

HYDROCARBON – Benzene, Toluene, p-Xylene

NITRO HYDROCARBON – Nitrobenzene, m-di-nitrobenzene

HALOGENATED HYDROCARBON – Carbon tetrachloride, Chlorobenzene,

AMIDE – Urea

ANILIDE – Acetanilide

N. B. Candidate should perform the analysis of at least 10 substances.