

RAJA SHANKAR SHAH UNIVERSITY, CHHINDWARA (M.P.)

M.Sc. Industrial Chemistry

Semester - IV									
Course Code	Papers	Title	Type	Theory Examination		Internal Assessment		Practical Examination	
				Max.	Mini	Max	Mini	Max	Mini
MICH-401	I	IPR, TQM & Technology Management	Compulsory	40	14	10	4		
MICH-402	II	Organic Chemistry-IV	Compulsory	40	14	10	4		
MICH-403	III	Advance Instrumental Techniques	Compulsory	40	14	10	4		
MICH-404(A)	IV	A. Petrochemicals, Oils & Soaps	Elective	40	14	10	4		
MICH-404(B)		B. Medicinal Chemistry-III	Elective	40	14	10	4		
MICH-405	V	Industrial Training / Internship & Dissertation & Viva	Compulsory					150	75

Grand Total Maximum Marks **350**

*Note: -

1. Industrial Training/ Internship Certificate is compulsory from concerned Industry.
2. Dissertation Title must be related to the Industrial Training/ Internship.

For less

*Approved
25/5/24
(online)*

RAJA SHANKAR SHAH UNIVERSITY, CHHINDWARA (M.P.)
M.Sc. Industrial Chemistry

Semester - IV

Paper -I

MICH-401 : IPR, TOM & TECHNOLOGY MANAGEMENT

UNIT - I :-

Role of patent in the pharmaceutical industries: Pharmaceutical legislation in India, Code of professional Ethics, pharmacy Act 1948, The drugs and cosmetics Act 1940, Drugs and Magic Remedies (Objectionable Advertisement) Act 1954, Narcotic Drugs and Psychotropic Substances Act 1985, Drug Price control order 1995.

UNIT-II :-

IPR, management of IPR, various IPR, Viz. copyrights and traditional knowledge, patents, condition of patentability, steps to obtain a patent, source of patent information, infringement analysis.

UNIT - III :-

Concepts of ISO, Total Quality Management (TQM), Six Sigma, Kaizen, JIT, Total Quality Control (TQC), Total Waste Elimination (TWE), Total Productive Maintenance (TPM).

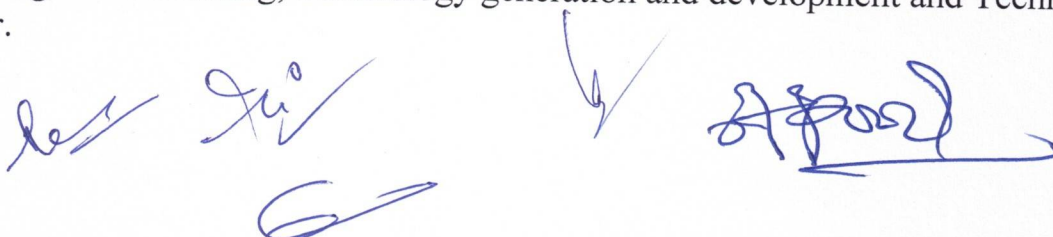
UNIT - IV :-

Concepts and guidelines of USFDA, Good Manufacturing Practices (GMP) guidelines, Good Clinical Practices (GCP) guidelines, International council for Harmonization (ICH) guidelines, research methodology used in CRO

UNIT - V :-

Technology Management: Basic concepts, role and importance to technology management, Technological change, and Technology life cycle, diffusion and growth of Technology, Technology planning, Technology dev. and strategies,

Technological forecasting, Technology generation and development and Technology transfer.



RAJA SHANKAR SHAH UNIVERSITY, CHHINDWARA (M.P.)**M.Sc. Industrial Chemistry****Semester - IV****Paper –II****MICH-402 : ORGANIC CHEMISTRY -IV****UNIT—I:-**

Nitration: nitrating agents, aromatic nitration, kinetics and mechanism of aromatic nitration. Nitration of paraffinic hydrocarbons. Process equipment for technical nitration. Recent reagents used in nitration. Typical industrial nitration process

UNIT- II :-

Halogenations: Halogenating agents, thermodynamics and kinetics of halogenation reactions. Chlorination in the presence of catalyst. Photo halogenation, design and construction of equipment for halogenation. Typical industrial halogenation process.

UNIT — III :-

Sulphonation: Sulphonating agents and their principle applications. Physical and chemical factors in sulphonation. Kinetic, mechanism and thermodynamic. Desulphonation reaction, industrial equipments and techniques. Typical industrial sulphonation process.

UNIT — IV :-

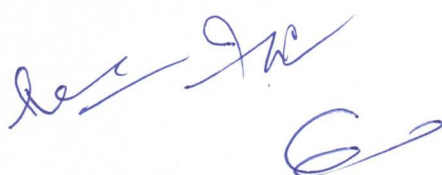
Esterification: Esterification of organic acids. Ester of inorganic acids. Typical industrial esterification reaction.

Hydrolysis: Hydrolysing agents, kinetic mechanism and thermodynamic of hydrolysing equipments for hydrolysis. Typical industrial hydrolytic reaction.

UNIT — V :-

Alkylation: Types of alkylation, alkylating agents, factor controlling alkylation. Kinetics and mechanism, some industrial alkylating process.

Amination: Aminating agents physical and chemical factors affecting aminolyting. Catalyst used in aminating reaction. Kinetics of aminolysis. Design of reactor technical manufacture of amino compounds.



RAJA SHANKAR SHAH UNIVERSITY, CHHINDWARA (M.P.)**M.Sc. Industrial Chemistry****Semester - IV****Paper -III****MICH-403 : ADVANCE INSTRUMENTAL TECHNIQUES****UNIT - I :-**

Thermo analytical Methods: thermo gravimetry, factors affecting thermo gravimetric curves, derivative thermo gravimetry (DTG), thermo balance. Applications of thermo gravimetry, differential thermal analysis, factors affecting DTA curves, instrumentation, application of DTA.

Differential scanning calorimetry (DSC), theory, instrumentation, applications of DSC, thermometric titrations, principal classification. Instrumentation and application of thermo gravimetric titrations and online analysis.

UNIT-II :-

Electro analytical methods:

Electro gravimetric analysis, theory, apparatus cell process, deposition and separation. Electrolytic separation of metals.

Coulometry, apparatus and general techniques controlled potential coulometry. Potentiometry — Fundamentals, reference electrodes (Hydrogen, calomel, silver and silver chloride electrode).

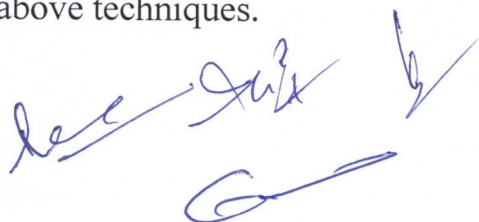
Indicator and ion selective electrode, instrumentation and measurement of cell and emf conductance and conductometric titrations

UNIT -III :-

Diffraction techniques : General theory and instrumentation of neutron diffraction and X-Ray diffraction. Applications of X-Ray diffraction for characterization and structure of materials. Application of neutron diffraction to structure of magnetic materials.

UNIT - IV :-

Refractrometry, Polarimetry, Flourosence and Phosphorance spectrometry. Optical Rotatry dispersion (ORD) and circular dichroism (CD) theory, instrumentation and application of above techniques.



UNIT – V :-

Surface characterization by spectroscopy and microscopy, Introduction, surface scanning electron microscopy, scanning probe microscope.

Supercritical fluids chromatography and extraction.

Properties of super critical fluids, super critical fluids chromatography and super critical fluids extraction.

Dr. Gu

Gu

↓

Agarwal

RAJA SHANKAR SHAH UNIVERSITY, CHHINDWARA (M.P.)**M.Sc. Industrial Chemistry****Semester - IV****Paper -IV(A)****MICH-404(A) : PETROCHEMICALS, OILS & SOAPS****UNIT - I :-**

Petrochemicals: Constituents of Petroleum, Processing or Refining, Petrochemicals, Feedstock's, Preparation of methane, ethylene, propylene, butylenes and cyclic compounds from petrochemical.

UNIT - II :-

Oils: Edible and nonedible oils, chemical composition and physical properties of vegetable oils, Method of extracting oils, Hydrogenation of oils.

UNIT - III :-

Soaps and detergents: Cleaning agents, Soaps, manufacture of soaps, Glycerin, Methods of production of glycerin, Detergents, manufacture of various kinds of detergents, cleaning action of soaps and detergents, Use Pattern, Saponification value, Acid values, Iodine value, Total fatty matter.


UNIT-IV :-

Surfactant & Disinfectant: Surfactants, classification of surfactant, Raw material of surfactants, Different Bleaching agents, Function of bleaching agents.

Disinfectant, classification of disinfectant, and its application, Phenolic derivative as disinfectant, Phenolic coefficient.

UNIT -V :-

Lubricants: Introduction, surface energy, Adsorption, Laws of friction, Theories of wear, Lubrication, Mechanism of Lubrication, Classification of Lubricants, Lubricating emulsions. Properties of lubricants. Flash point, Fire point, Smoke point, Turbidity point.



RAJA SHANKAR SHAH UNIVERSITY, CHHINDWARA (M.P.)**M.Sc. Industrial Chemistry****Semester - IV****Paper –IV(B)****MICH-404(B) : MEDICINAL CHEMISTRY – III****UNIT- I :-****Drugs acting on CNS:**

- (a) Introduction, site and mechanism of action of some neurotransmitters
Dopamine, Acetyl choline, G
- (b) ABA, Histamine.
- (c) General and Local anaesthetics. Classification, pharmacology, mode of action, adverse effects, synthesis of Ether, Halothane, Nitrous Oxide, Chloroform, Thiopentone sodium, Ketamine hydrochloride, Lignocaine hydrochloride, cinchocaine, phenacainieHCl, Ethyl- p-amino benzoate.

UNIT- II :-

- a) Sedatives and hypnotics: Classification, pharmacology, mode of action, adverse effects, synthesis and structure activity relationship of Barbiturates (Barbiton, Phenobarbital, Allobarbital, Thiopental sodium), Benzodiazepines (Diazepan, buspirone) and alcoholic hypnotics.
- b) Tranquilizers or Antianxiety Agents: Classification, pharmacology, mode of action, adverse effects, synthesis and structure activity relationship of Chlorpromazine, Haloperidol, Benzodiazepines.

UNIT- III :-

- (a) Anticonvulsants and Antiepileptic drugs: Classification, pharmacology, mode of action, adverse effects, synthesis and structure activity relationship of Phenobarbital, Phenytoin Sodium, Trimethadione, Phensuximide, Primidone.



- (b) CNS stimulants: Classification, pharmacology, mode of action, adverse effects, synthesis and structure activity relationship of Caffeine, Theophylline, Doxapram, Cocaine.
- (c) Hallucinogens: Classification, pharmacology, mode of action, adverse effects, synthesis and structure activity relationship of Lysergic acids Diethylamide(LSD).

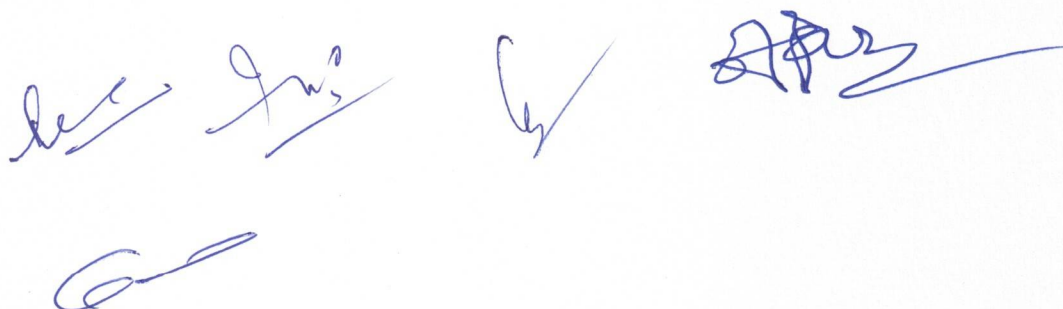
UNIT- IV :-

- a) Antiseptic and Disinfectants: Classification, pharmacology, mode of action, adverse effects, synthesis and structure activity relationship of Potassium permanganate, Hydrogen peroxide, Chlorhexidine, Cetrimide, ethanol, formaldehyde, glutaraldehyde, silver nitrate, silver sulfadiazine, gentian violet, acriflavine.
- b) Ectoparasiticides: Classification, pharmacology, mode of action, adverse effects, synthesis and structure activity relationship of Benzyl benzoate, Lindane.
- c) General Treatment of Poisoning

UNIT – V :-

Anti diabetic drugs and Insulin

Classification, Pharmacology, mode of action, adverse effects of Chlorpropamide (Glipizide, Gliclazide, Glimepiride), Metformin, Nateglinide, Rosiglitazone and Miglitol.
Insulin and its mode of action

The image shows five handwritten signatures in blue ink, arranged in two rows. The top row contains four signatures, and the bottom row contains one signature.

RAJA SHANKAR SHAH UNIVERSITY, CHHINDWARA (M.P.)

M.Sc. Industrial Chemistry

Semester - IV

Paper - V

MICH-405 : Industrial Training / Internship & Dissertation & Viva

[Handwritten signature]

[Handwritten signature]

[Handwritten mark]

[Handwritten mark]