B.Sc. CHEMISTRY

Our Department of Chemistry was established in the year 2003 with UG and PG courses and upgraded as research department with M. Phil and Ph.D. course in the year 2009 and 2013 respectively with a view of imparting scientific temper among the rural society. The department deals with mode of action and satellite mapping of global spray properties. A team of highly qualified and experienced faculty members who contribute their very best with single – minded, innovative methodology, individual and careful grooming, thereby providing the students with ample opportunities to become winning personalities. Our Department has well equipped laboratories with sophisticated apparatus and instruments. Our department has a MoU with Central Leather Research Institute (CLRI), Chennai. Our M.Sc., students have done their project works in Central Electrochemical Research Institute (CECRI), Karaikudi. One of the proudest parts of the department is every year we produce a good number of university rank holders.

I.   SCOPE OF THE COURSE

The uniqueness of the B.Sc. (Chemistry) program is its content and topic coverage, the teaching methodology and the faculty. The program expects a serious commitment of the students to take up challenging study schedules and assignments. The course involves a blend of theoretical education and practical training which run concurrently for a period of three years and equips a student with knowledge, ability, skills and other qualities.

 The teaching methodologies include classroom lectures, industrial visits, orientation and internship. The new syllabus may help the students to understand the newer aspects of chemistry and apply the same to the real life situations. Thus the students turn more relevant and resourceful to the society. It may enable the young minds think differently and forms a link between old ideas and new ideas in chemistry and gives comprehensive approaches to the very learning process and the learners.

II.   SALIENT FEATURES

- ✓ Course is specially designed for a higher level career placement.
- ✓ Special guest lectures from industrialists will be arranged.

- ✓ Exclusively caters to students interested in pursuing higher studies.
- ✓ Special industry orientations and training are parts of the degree course.

III. OBJECTIVES OF THE COURSE

The new syllabus throws light on the recent and emerging areas of chemistry.

- ✓ Enable the students to understand chemistry and make them more relevant to the society.
- ✓ Develop the analytical ability in students so that they are become objective in solving problems.
- ✓ Help the students to learn practical skills in a better way.
- ✓ Inculcate research aptitude among the students.
- ✓ Enable the students to go to higher levels of learning chemistry.
- ✓ Improve the employability of the students.
- ✓ Inspire the students to apply their knowledge gained for the development of society in general and individuals in particular.

IV. ELIGIBILITY FOR ADMISSION

Candidates seeking admission to the first year degree course (B.Sc. Chemistry) shall be required to have passed higher secondary examination with chemistry as one of the subjects conducted by the government of Tamilnadu in +2 or equivalent.

V. DURATION OF THE COURSE

- ➤ The course shall extend over a period of three academic years consisting of six semesters. Each academic year will be divided into two semesters. The first semester will consist of the period from July to November and the second semester from December to April.

- ➤ The subjects of the study shall be in accordance with the syllabus prescribed from time to time by the Board of Studies of Vivekanandha College of Arts and Sciences for Women (Autonomous), Tiruchengode with the approval of Periyar University, Salem.

- ➤ Each subject will have required hours of lecture per week apart from practical training.

VI. CONTINUOUS INTERNAL ASSESSMENT

The performance of the students will be assessed continuously and the Internal Assessment Marks will be as under:

1. Average of two Tests   - 15 Marks

2. Seminar / Assignment   -   5 Marks

3. Attendance   -   5 Marks
              ……………
Total   = 25 Marks
              ……………

PASSING MINIMUM

EXTERNAL

In the End Semester Examinations, the passing minimum shall be 30 out of 75 Marks for theory (40 %) and 24 out of 60 marks for practical (40 %).

VII. ELIGIBILITY FOR APPEARING EXAMINATION

A candidate will be permitted to appear for the End Semester Examination only on earning 75 % of attendance. It shall be open to grant exemption to a candidate for valid reasons subject to the conditions prescribed.

VIII. CLASSIFICATION OF SUCCESSFUL CANDIDATES

1. Successful candidates passing the examination of core and allied papers and securing

   a) 75 % and above shall be declared to have passed the examination in first class with distinction provided they pass all the examinations prescribed for the course at first appearance itself.

   b) 60% and above but below 75 % shall be declared to have passed the examinations in first class.

   c) 50% and above but below 60% shall be declared to have passed the examinations in second class.

   2. All the remaining successful candidates shall be declared to have passed the examinations in third class.

   3. Candidates who pass all the examinations prescribed for the course at the first appearance itself and within a period of three consecutive academic years from the year of admission only will be eligible for ranking purpose.

IX. ELIGIBILITY FOR AWARD OF THE DEGREE

A candidate shall be eligible for the award of the degree only if she has undergone the above degree for a period of not less than three academic years comprising of six semesters and passed the examinations prescribed and fulfiled the conditions prescribed.

X. PROCEDURE IN THE EVENT OF FAILURE

If a candidate fails in a particular subject, she may reappear for the End Semester Examination in the concerned subject in subsequent semesters and shall pass the examination.

XI. COMMENCEMENT OF THESE REGULATIONS

These regulations shall take effect from the academic year 2014-15.

XII. COURSE PATTERN – UG

SEM	PART	PAPER CODE	TITLE OF THE PAPER	NO OF HRS/WK	CREDIT	MARKS		
						INT	EXT	TOTAL
I	I	14U1LT01	Tamil-I	6	3	25	75	100
	II	14U1LE01	English-I	6	3	25	75	100
	III	14U1PHA01	Allied Physics-I	5	3	25	75	100
	III	14U1CHC01	Core-I General Chemistry - I	5	5	25	75	100
	IV	14U1VE01	Yoga	2	2	25	75	100
	III	14U2CHCP01	Core practical-I Volumetric Estimation	3	-	-	-	-
	III	14U2PHAP01	Allied practical - I	3	-	-	-	-
			Total	30	16	25	75	500
II	I	14U2LT02	Tamil-II	6	3	25	75	100
	II	14U2LE02	English-II	6	3	25	75	100
	III	14U2PHA02	Allied Physics-II	5	3	25	75	100
	III	14U2CHC02	Core-II General Chemistry - II	5	5	25	75	100
	IV	14U2ES01	Environmental Studies	2	2	25	75	100
	III	14U2CHCP01	Core practical-I Volumetric Estimation	3	4	40	60	100
	III	14U2PHAP01	Allied practical-I	3	3	40	60	100
			Total	30	23	205	495	700

III	I	14U3LT03	Tamil-III	6	3	25	75	100
	II	14U3LE03	English-III	6	3	25	75	100
	III	14U3MAA01	Allied Maths-I	7	3	25	75	100
	III	14U3CHC03	Core-III General Chemistry - III	6	5	25	75	100
	IV	14U3PHN01	NMEC-I Essentials of Electricity	2	2	25	75	100
	III	14U4CHCP02	Core practical-II Inorganic Qualitative Analysis and preparations	3	-	-	-	-
			Total	30	16	125	375	500
IV	I	14U4LT04	Tamil-IV	6	3	25	75	100
	II	14U4LE04	English-IV	6	3	25	75	100
	III	14U4MAA02	Allied Maths-II	4	3	25	75	100
	III	14U4MAA03	Allied Maths-III	4	3	25	75	100
	III	14U4CHC04	Core-IV General Chemistry-IV	5	5	25	75	100
	IV	14U4PHN02	NMEC-II Physics in Every Day Life	2	2	25	75	100
	III	14U4CHCP02	Core practical-II Inorganic Qualitative Analysis and Preparations	3	4	40	60	100
			Total	30	23	190	510	700

SEM	PART	PAPER CODE	TITLE OF THE PAPER	NO OF HRS/WK	CREDIT	MARKS		
						INT	EXT	TOTAL
V	III	14U5CHC05	Core-V Organic Chemistry – I	4	5	25	75	100
	III	14U5CHC06	Core-VI Inorganic Chemistry - I	4	5	25	75	100
	III	14U5CHC07	Core-VII Physical Chemistry - I	4	5	25	75	100
	IV	14U5CHE01	Elective – I Analytical Chemistry	3	5	25	75	100
	IV	14U5CHS01	SBEC - I Spectroscopy	3	3	25	75	100
	IV	14U5CHS02	SBEC – II Computer Applications in Chemistry	3	3	25	75	100
	III	14U6CHCP03	Core practical-III Physical Chemistry	3	-	-	-	-
	III	14U6CHCP04	Core practical-IV Organic analysis and preparation, Gravimetric Estimations	6	-	-	-	-
Total				30	26	150	450	600
VI	III	14U6CHC08	Core-VIII Organic Chemistry – II	4	5	25	75	100
	III	14U6CHC09	Core-IX Inorganic Chemistry - II	4	5	25	75	100
	IV	14U6CHC02	Core-X Physical Chemistry - II	4	5	25	75	100
	IV	14U6CHE03	Elective – II	3	4	25	75	100

		Medicinal Chemistry					
IV	14U6CHS03	SBEC- III Polymer Chemistry	3	3	25	75	100
IV	14U6CHS04	SBEC – IV Applied Chemistry	3	3	25	75	100
III	14U6CHCP03	Core practical-III Physical Chemistry	3	4	40	60	100
III	14U6CHCP04	Core practical-IV Organic analysis and preparations, Gravimetric Estimations	6	6	40	60	100
	14U6EX01	External activity	-	1	-	-	-
		Total	30	36	230	570	800
		Grand Total	**180**	**140**	**1025**	**2775**	**3800**

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QUESTION PATTERN (UG)

B.Sc., (Chemistry)

Time: 3 Hours   Max.Marks:75

SECTION A (10 X 2 = 20 Marks)

Answer ALL the Questions

- Two Questions from each unit.

SECTION B (5 X 5 = 25 Marks)

Answer ALL the Questions

- Either...Or… Type
- Two Questions from each unit.

SECTION C (3 X 10 = 30 Marks)

Answer any Three Questions

- Open choice
- One Question from each unit.

VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN
(AUTONOMOUS)
DEPARTMENT OF CHEMISTRY
SYLLABUS

Semester-I	**Total Hrs: 60**
Paper Code: 14U1CHC01	**Credit: 5**

GENERAL CHEMISTRY-I

OBJECTIVES

To enable the students to learn about the fundamentals of chemistry and principles of various topics.

Learning Outcome

Students will be known atomic structure and electronic configurations of atom, also to understand the variation of physical and chemical properties.

Students can understand covalent bonding – concept of hybridization and electron displacement effect, etc.

Students will be enhanced their knowledge towards postulates of kinetic theory of gases, liquefaction of gases, quantum theory and atomic spectra.

Students will learn the basics of quantum chemistry.

Students will gain knowledge about titrimetry and qualitative analysis of inorganic mixtures.

UNIT-I: Electronic structure and periodic properties **(12)**

Quantum numbers and their significance, Pauli's exclusion principle, Hund's rule, Aufbau principle, Extra stability of half-filled and completely filled orbital, Electronic configuration of atoms. Modern periodic law, Long form of periodic table, cause of periodicity, division of elements into s, p, d, and f blocks. Variation of atomic radius, ionic radius, ionisation energy, electron affinity and electro negativity along the periods and down the groups- Factors affecting ionisation energy and electro negativity.

UNIT-II: Basic concepts in organic chemistry **(12)**

Covalent bonding – Concept of hybridization – Structure of organic molecules based on sp^3, sp^2 and sp hybridization – Covalent bond properties of organic molecules: bond length, bond angle, bond energy, bond polarity, dipole moment. Electron Displacement effects: Inductive, Mesomeric, Electromeric and

Hyperconjugative effects. Reactive intermediates –carbocations – carbanions – free radicals with examples. Types of reactions: Addition, Substitution, Elimination, Rearrangement.

Types of isomerism in organic compounds.

UNIT-III: Gaseous State   (13)

Postulates of kinetic theory of gases, derivation of kinetic gas equation, ideal gas equation, Boyle's law, Charles law, Graham's law of gaseous diffusion and Dalton's law of partial pressure. Maxwell's distribution of molecular velocities (no derivation), Root mean square, average and most probable velocity, Collision diameter, collision frequency, collision number and mean free path.

Deviations of real gases from ideal behaviour- Derivation of Vander Waal's equation for real gases. Critical phenomena: PV isotherms of real gases, continuity of states, critical constants, relationship between critical and Vander Waal's constants, determination of critical volume, the principle of corresponding states, liquefaction of gases.

UNIT-IV: Basic Quantum Chemistry   (12)

CGS and SI units – Basic units – derived units – subsidiary units –Quantum theory and atomic spectra – Bohr's model of atom – Limitations of Bohr model –Somerfield's model – photoelectric effect -Compton effect – de Broglie equation –Davisson and Germer experiment – Heisenberg's uncertainty principle – Schrodinger's wave equation (statement only) – Eigen values - Eigen function –Significance of ψ and ψ^2 – Radial and angular distribution function – Concept and Shapes of orbital - Differences between orbit and orbital.

UNIT-V: Data Analysis and Titrimetry   (11)

The mean, the median, precision, accuracy, confidence limit. Errors and its types - Significant figure. Definitions of molarity, molality, normality and mole fraction. Titration - Back titration - Equivalence point – Indicator – Standard solution - Primary and secondary standards- Types of titrations - Acid-base, redox, precipitation and complexometric titrations.

Text Books
01. Puri B.R., Sharma L.R., Kalia K.K., Principles of Inorganic Chemistry (50th edition),
     New Delhi, S. Chand &Co., (2011).
02. Puri B.R., Sharma L.R., Pathania M.S., Principles of Physical Chemistry (23[rd]edition)
     New Delhi, S. Chand &Co., (2004).
03. Bahl B.S. and Arun Bahl, Advanced Organic Chemistry, (19th edition), New Delhi,
     S. Chand & Co., (2010).

References

01. Morrison R.T. and Boyd R.N., Organic Chemistry (6th edition), New York, Allyn & Bacon Ltd., (1992).
02. Madan.R.D., Inorganic Chemistry (3rd edition), New Delhi, S. Chand and Co., (2012).
03. Mukherji.S.M, Singh.S.P, Kapoor.R.P, Organic Chemistry volume – I (4th edition) New age International (p) limited (1998).

DEPARTMENT OF CHEMISTRY

SYLLABUS

Semester-II	Total Hrs: 60
Paper Code: 14U2CHC02	Credit: 5

GENERAL CHEMISTRY-II

OBJECTIVES

1. To gain knowledge about shapes of inorganic molecules and metallurgy.

2. Acquire the knowledge about hydrocarbons.

Learning Outcome

Students will learn the basic concepts of ionic and covalent bond.

Students will know about the different metallurgical processes and purification techniques.

Students will gain knowledge regarding preparation and properties of alkanes, cycloalkanes, alkenes and alkynes.

Students will enhance their knowledge towards various properties of liquids.

UNIT-I: Chemical bonding (12)

Ionic bond- factors influencing the formation of ionic bond- characteristics of ionic compounds- lattice energy and its determination by using Born-Haber Cycle. Covalent bond- factors influencing the formation of bond- characteristics of covalent compounds -partial ionic character in covalent compounds- polarization of ions- Fajan's rule and its applications.VSEPR theory- explanation of shapes of simple covalent molecules such as NH_3, H_2O, CH_4. Molecular orbital theory- molecular orbital configuration of homo nuclear diatomic molecules- H_2,He_2,F_2,O_2 and hetero nuclear molecular orbitals- CO and NO.

UNIT-II: Metallurgy (10)

Occurrence of metals-various steps involved in the metallurgical processes. Concentration of ore by froth floatation-gravity separation-magnetic separation processes. Calcination- Roasting- smelting- Alumino thermic process. Purification of metals by electrolysis- zone refining. Extraction of Al, Cu, Fe and U .

UNIT-III: Alkanes and Alkenes (13)

Petroleum source of alkanes – Methods of preparing alkanes – Chemical properties—Mechanism of free radical substitution in alkanes by halogenation - Uses – Conformational study of ethane and n-butane. Cycloalkanes – nomenclature – methods of formation – chemical reactions, Baeyer's strain theory and its limitations. Alkenes- orbital model of double bond, chemical reactions of alkenes- mechanism of Electrophilic and free radical additions- Markownikoff's rule, peroxide effect, hydroboration, ozonolysis and allylic substitution by NBS. Diels-alder reaction . Elimination reactions-mechanisms of E1 and E2 reactions-Hofmann and saytzeff rule.

UNIT-IV: Alkadiene and Alkynes   (12)

Dienes- classification of dienes- isolated, conjugated, cumulated dienes, structure of allene and butadiene, 1,2 and 1,4 addition. Orbital model of triple bond- chemical reactions of alkynes- acidity of alkynes- formation of acetylides- mechanism of Electrophilic and nucleophilic addition reactions of alkynes - hydrogenation, halogenation, hydrohalogenation , hydration, hydroboration, oxidation, metal ammonia reduction, oxidation and polymerization.

UNIT –V: Liquid State   (13)

Structure of liquids-Vapour pressure-Trouton's rule- Determination of Vapour pressure –dynamic and static method –Effect of temperature on vapour pressure -Surface tension-Surface energy surface active reagents-Some effects of surface tension-Viscosity-Effect of temperature on viscosity (Experimental determination of surface tension and viscosity not necessary). Refractive index- Specific refraction-Molar refraction - Optical activity. Liquid crystals (The mesomorphic state) - classification of liquid crystal smectic-nematic and cholestric liquid crystals.

Text Books

01. Puri B.R., Sharma L.R., Kalia K.K., Principles of Inorganic Chemistry (50th edition),

New Delhi, S. Chand &Co., (2011).
02. Puri B.R., Sharma L.R., Pathania M.S., Principles of Physical Chemistry (23rd edition)
New Delhi, S. Chand &Co., (2004).
03. Bahl B.S. and Arun Bahl, Advanced Organic Chemistry, (19th edition), New Delhi,
S. Chand & Co., (2010).

References

01. Morrison R.T. and Boyd R.N., Organic Chemistry (6th edition), New York, Allyn &

Bacon Ltd., (1992).
02. Madan.R.D., Inorganic Chemistry (3rd edition), New Delhi, S. Chand &Co., (2012).
03. Mukherji.S.M, Singh.S.P, Kapoor.R.P, Organic Chemistry volume – I (4th edition)
New age International (p) limited (1998).

Semester- I/II	**Total Hrs: 60**
Paper Code: 14U2CHCP01	**Credit: 4**

CORE PRACTICAL –I
VOLUMETRIC ESTIMATIONS

OBJECTIVES

1. To understand the principles of volumetric analysis.

2. To enable the students to have hands-on training on preparation of simple inorganic complexes.

Learning Outcome

Students will learn how to conduct a process precisely.

Students will plan, conduct, review and report the experiment.

The students will learn the nature, significance, and influence of errors and how they may best be avoided or minimized during quantitative examination of a chemical compound

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I. Acidimetry

1. Estimation of sodium hydroxide-standard sodium carbonate.
2. Estimation of hydrochloric acid- standard oxalic acid.
3. Estimation of Oxalic acid –standard-oxalic acid.

II. Permanganometry

5. Estimation of oxalic acid-std-Mohr's salt or ferrous sulphate.
6. Estimation of sodium nitrite-standard oxalic acid.
7. Estimation of ferrous ion.

III. Iodometry

8. Estimation of copper-standard Potassium dichromate.
9. Estimation of Potassium dichromate-standard potassium dichromate.

IV. Dichrometry

10. Estimation of ferric ion using diphenyl amine/N-Phenylanthranilic acid as indicator.

REFERENCES

1. V. Venkateswaran, R. Veeraswamy and A.R.Kulandaivelu, Basic Principles of Practical Chemistry, New Delhi, S.Chand & Co, (1995).
2. Pandey.O.P, Bajpai.D.N., Giri.S., Practical Chemistry, New Delhi, S.Chand & Co, (2012).

VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN

(AUTONOMOUS)

DEPARTMENT OF CHEMISTRY

B.Sc. DEGREE EXAMINATION - I SEMESTER

MODEL QUESTION- GENERAL CHEMISTRY – I

Time: 3 hrs   **Max Marks: 75**

PART - A
Answer all the questions.   **10 X 2=20**

1. Which of the following is correct? Give reason. $Cr – 3d^5 4s^1$ & $Cr – 3d^4 4s^2$

2. Which of the following has high atomic radius? Give reason. F, Cl, Br & I
3. Which of the following is more stable? Give reason. $(CH_3)_3C^+$ & $(CH_3)_2CH^+$
4. Define and identify the functional isomers from the following. CH_3CH_2OH & CH_3OCH_3, $CH_3CH_2CH_2OH$ & $CH_3CH(OH)CH3$, $CH_3CH_2CH_2CH_3$ & $CH_3CH(CH_3)CH3$
5. Define Dalton's law.
6. Define the principle of corresponding states.
7. What is photoelectric effect?
8. Define Heisenberg's uncertainity principle.
9. Define molarity.
10. What are primary standards? Give an example.

PART - B
Answer all the questions.   **5 X 5 = 25**

11. (a) Explain the variation of atomic & ionic radius along the periods & groups. (OR)

    (b) Explain the division of elements into s, p, d & f block elements.
12. (a) Explain sp^2 & sp hybridisation with examples. (OR)
    (b) Explain briefly about carbocations with examples.
13. (a) Define root mean square, mean & probable velocities with equation. (OR)
    (b) How will you determine critical volume?
14. (a) What are the differecnces between orbit & orbitals? (OR)
    (b) Explain Davisson Germer experiment.
15. (a) Explain the types of errors. (OR)
    (b) Write short note on complexometric titrations.

PART - C
Answer ANY three questions.   **3 X 10 = 30**

16. Discuss the factors affecting ionization energy.

17. Explain in detail about hyper conjugative effect with examples.
18. Derive vander waal's equation of real gases.
19. Explain the shapes of orbitals in detail.
20. Explain in detail about acid base titrations.

VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN
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DEPARTMENT OF CHEMISTRY
B.Sc. DEGREE EXAMINATION - II SEMESTER
MODEL QUESTION- GENERAL CHEMISTRY – II

Time: 3 hrs   **Max Marks: 75**

PART - A

Answer all the questions.   **10 X 2=20**

1. Define covalent bond.
2. Draw the MO diagram of He_2. Calculate the bond order.
3. What do you meant by calcinations?.
4. List out the uses of copper.
5. Write the preparation of Alkanes ?
6. State Hoffman Rule with example.
7. Write the classification of dienes with example.
8. Write any one reaction for oxidation reaction.
9. State Trouton's rule.
10. Define optical activity.

PART - B

Answer all the questions.   **5 X 5 = 25**

11. a) Draw MO diagram for O_2 molecule. (OR)

     b) Define ionic bond. Explain their characteristics.
12. a) Write a note on magnetic separation process. (OR)
     b) Explain the extraction of Iron.
13. a) Write note on conformational study of n-butane. (OR)
     b) Explain Markownikoff's rule with example .
14. a) Explain the acidity of alkynes. (OR)
     b) Explain the formation of acetylides.
15. a) Define viscosity .Explain the effect of temperature on viscosity . (OR)
     b) Explain the determination of vapour pressure by dynamic method.

PART - C

Answer ANY THREE questions.   **3 X 10 = 30**

16. Define Lattice energy. How it's determined by using Born-Haber cycle.

17. Explain the extraction of Aluminium and its properties, uses.
18. a) Explain Elimination reaction and their mechanism of E1 and E2 reactions.
     b) Write a note on Diels- alder reaction.
19. a) Explain metal ammonia reduction.
     b) Write a note on 1, 4 addition of butadiene with example.
20. a) Explain liquid crystal & its classifications.
     b) Define refractive index and molar refraction.

VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN
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DEPARTMENT OF CHEMISTRY
SYLLABUS

Semester-I/III	**Total Hrs: 60**
Paper Code: 14U1CHA01/14U3CHA01	**Credit: 3**

ALLIED CHEMISTRY-I

OBJECTIVES

1. To gain a knowledge of molecule formation from their atomic orbital and various organic reaction mechanism.

2. To know how chemistry is applied in the field of pharmaceutical and agriculture.

Learning Outcome

Students will know the details of bonding, anti bonding and non bonding and Interhalogen compounds.

Students gain the knowledge of various organic reaction mechanism.

Students accquire the knowledge of errors, concentration solution and different type of titrations.

Students will gain the information regarding terms used in pharmacology, antibiotics and sulpha drugs.

Students will study natural and artificial fertilizers.

UNIT-I :Molecular Orbital Theory and InterHalogen Compounds (12)

1.1 Chemical Bonding - Molecular orbital theory- bonding, anti bonding and non-bonding molecular orbital - Bond order - MO configuration of H_2, N_2, O_2, F_2 and CO.

1.2 Inter halogen Compounds- Types of Inter halogen Compounds. Preparation, properties, uses and structures of ICl, BrF_3 and IF_5.

UNIT-II :Organic Reactions (12)

2.1 Classification of reactions- substitution, addition, elimination reactions – explanation. Only definition of isomerisation, polymerization, condensation with examples.

2.2 Hybridization –definition, classification and explanation of methane, acetylene, ethyne.

2.3 Aromaticity- Huckel's rule. Electrophilic substitution in benzene - Mechanism of nitration, halogenation, alkylation.

UNIT-III: Electrochemistry-I (12)

17

Introduction- Electrolysis- Faraday's law-Conductance of electrolytes- Specific conductance, equivalent conductance, molar conductance- variation of conductance with dilution-Kohlrausch law- Applications. Transport number-definition and its determination by Hittorf method. Common ion Effect-Conductometric titrations. pH definition- determination by Colorimetric (indicator) method- Buffer solutions- Definition, Determination of pH of buffer solutions -Henderson equation – Derivation - Buffer solutions in living systems.

UNIT-IV: Pharmaceutical Chemistry-I   (12)

Antibiotics - Definition, classification –broad and narrow spectrum antibiotics. penicillin, chloramphenical and erythromycin - structure and mode of action (structure elucidation not needed). Sulpha drugs- preparation of sulphaguanine and sulphathiazole. Mechanism and mode of action of sulpha drugs.

UNIT-V: Industrial Chemistry-I   (12)

Corrosion- Types of corrosion- Prevention of corrosion. Paints – Requirements of good paint, primary constituents of paints and their functions, dispersion medium(solvent), thinner, binder, pigments, oil-based paints, manufacture of paints and special paints. Varnishes – Constituents, characteristics of good varnish, types and uses, basic concept of lacquers and enamels.

References

01. Puri B.R., Sharma L.R., Kalia K.K., Principles of Inorganic Chemistry (50th edition),

   New Delhi, S. Chand &Co., (2011).
02. Puri B.R., Sharma L.R., Pathania M.S., Principles of Physical Chemistry (23[rd]edition)
   New Delhi, S. Chand &Co., (2004).
03. Bahl B.S. and Arun Bahl, Advanced Organic Chemistry, (19th edition), New Delhi,
   S. Chand & Co., (2010).
04. Jayashree Ghosh .S, Fundamental concepts of Applied Chemistry, New Delhi, S. Chand & Co.,
   (2008)
05. Sharma.B.K., Industrial chemistry including chemical engineering (16th), Meerut,
   Krishnaprakasam media., (2011).

VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN
(AUTONOMOUS)
DEPARTMENT OF CHEMISTRY
SYLLABUS

Semester-II/IV	**Total Hrs:60**
Paper code: 14U2CHA02/14U4CHA02	**Credit: 3**

ALLIED CHEMISTRY-II

OBJECTIVES

1. To familiarize students with various chromatography techniques and its applications towards industries and research laboratories.

2. Students will know the chemistry of bio-organic and bio-inorganic compounds.

3. To edify the students about the various kinds of drugs and its uses.

4. To educate the students about the qualitative analysis of organic compounds.

Learning Outcome

Students will be able to understand the concept of various chromatographic techniques.

Students will know the details of bio organic compounds and bio inorganic compounds.

Students will gain knowledge of antipyretics, analgesic, antiseptics, disinfectants and anesthetics

Students will gain knowledge about analysis of organic compounds.

UNIT-I: Coordination compounds **(12)**

Addition compounds- double salts and complexes. Complexes (Mononuclear complexes only) General aspects- central metal atom, Ligand- types of ligands. Coordination number of central metal atom, oxidation number of central metal atom- Nomenclature (IUPAC system). Theories of Complexes- Werner's theory, Sidgwick theory, EAN rule, Pauling's theory-its applications with four and six coordination complexes- Chelation- Meaning, examples- EDTA applications.

UNIT-II :Amino acids and Carbohydrates **(12)**

2.1 Aminoacids- Preparation- Gabriel method, Strecker synthesis- Isoelectric point, Reactions of glycine. Polypeptide- Proteins- Classification- primary structure and its functions.

2.2 Carbohydrates-definition, Classification, Preparation and Reactions of glucose and fructose- Inter conversion of glucose to fructose and vice versa- sucrose and starch (structure only)

UNIT-III: Electrochemistry-II (12)

Cells- Galvanic cell with examples. Electrode potential - single electrode potential, sign of single electrode potential and electrode potential - Standard electrode potential - EMF and its measurements, electrochemical series and its significance, reference electrodes- hydrogen electrode and calomel electrode. Principles of electroplating and its uses, Batteries and its types.

UNIT-IV: Pharmaceutical Chemistry-II (12)

Structure and mode of action: Analgesics and Antipyretics-salicylic acid derivatives-aspirin, p-aminophenol derivatives- para acetamol and ibuprofen.Antiseptic and disinfectants-definition and distinction, crystal violet, acridine. Anaesthetics-definition, classification- local and general, preparation ,properties and uses of cocaine and benzo cocaine.

UNIT-V: Industrial Chemistry-II (12)

Dyes- definition- requisites of a true dye, classification of dyes-based on structure and mode of application, colours and chemical constitution-Witt's theory, Bayer theory. Dyeing forces-ionic interactions, hydrogen bonds, vander-waals interaction, covalent bonds with examples, cross dyeing-principle only Basic operations in dyeing process-preparation of fiber and dye bath, applications of dye and finishing.

References

01. Puri B.R., Sharma L.R., Kalia K.K., Principles of Inorganic Chemistry (50th edition),
    New Delhi, S. Chand &Co., (2011).
02. Puri B.R., Sharma L.R., Pathania M.S., Principles of Physical Chemistry (23rdedition)
    New Delhi, S. Chand &Co., (2004).
03. Bahl B.S. and Arun Bahl, Advanced Organic Chemistry, (19th edition), New Delhi,
    S. Chand & Co., (2010).
04. Jayashree Ghosh .S, Fundamental concepts of Applied Chemistry, New Delhi, S. Chand & Co.,
    (2008)
05. Sharma.B.K., Industrial chemistry including chemical engineering (16th) Meerut,
    Krishnaprakasam media. (2011).

VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN
(AUTONOMOUS)
DEPARTMENT OF CHEMISTRY
SYLLABUS

Semester-I,II /III, IV	**Total Hrs: 60**
Paper code:14U2CHAP01/14U4CHAP01	**Credit: 3**

ALLIED PRACTICAL –I
VOLUMETRIC ESTIMATIONS AND QUALITATIVE ORGANIC ANALYSIS
OBJECTIVES

1. To understand the principles of volumetric analysis.

2. To enable the students to have hands-on training on qualitative analysis of organic compounds.

Learning Outcome

Students will learn how to conduct a process precisely.

Students will plan, conduct, review and report the experiment.

I.VOLUMETRIC ESTIMATIONS

I.Acidimetry

  1. Estimation of sodium hydroxide-standard sodium carbonate.
  2. Estimation of Oxalic acid –standard-oxalic acid.
  3. Estimation of Hydrochloric acid – standard oxalic acid

II.Permanganimetry

  4.Estimation of oxalic acid-std-Mohr's salt or ferrous sulphate.
  5.Estimation of sodium nitrite-standard oxalic acid.
  6.Estimation of ferrous ion.

II.QUALITATIVE ORGANIC ANALYSIS

Systematic analysis of organic compounds:
    Characterization of Organic compounds by their functional groups and confirmation by preparation of derivative.

Functional groups that may be studied:
    Aldehydes, Ketones, carboxylic acids, aromatic primary amines, phenol,
amide, diamide, nitro compounds and monosaccharides.

REFERENCES

1. V. Venkateswaran, R. Veeraswamy and A.R.Kulandaivelu, Basic Principles of Practical
   Chemistry, New Delhi, S.Chand & Co, (1995).
2. Pandey.O.P, Bajpai.D.N., Giri.S., Practical Chemistry, New Delhi, S.Chand & Co, (2012).

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)
DEPARTMENT OF CHEMISTRY
B.Sc. DEGREE EXAMINATION
MODEL QUESTION- ALLIED CHEMISTRY – I

Time: 3 hrs **Max Marks: 75**

PART - A

Answer all the questions. **10 X 2=20**

1. Define MO.
2. What is meant by inter halogen compounds?
3. Define Huckel's rule with examples.
4. What is meant by addition reaction with examples?
5. Define Specific conductance and equivalent conductance.
6. Write a note on Buffer solution with examples.
7. Define antibiotics and condition for antibiotics.
8. Draw a structure and molecular formula of chloramphenicol.
9. What is meant by corrosion?
10. Write a note on basic concept of lacquers & Enamels.

PART - B

Answer all the questions. **5 X 5 = 25**

11. (a) Explain preparation, properties & uses of BrF_3. (Or)
    (b) Make a Difference between bonding & antibonding orbital.
12. (a) Write a note on hybridization of methane. (Or)
    (b) Explain electrophilic substitution in Benzene.
13. (a) (i)Explain common ion effect with examples.
        (ii)Define pH. (Or)
    (b) Describe Kohlrausch's law and its application.
14. (a) (i)Write a note on properties & uses of pencillin.
        (ii)Write a note on preparation & properties of sulphathiazol. (Or)
    (b) (i) Describe types of antibiotics.
        (ii)Write a note on properties, uses of sulphaguanine.
15. (a) Describe types of corrosion and prevention of corrosion. (Or)
    (b) (i) Explain paints & requirement of paints (ii) How to prepare Varnish.

PART - C

Answer ANY three questions. **3 X 10 = 30**

16. Draw MOT for carbon monoxide & F_2
17. What is meant by aromaticity? & explain the mechanism for Halogenation & Friedal-Craft alkylation.
18. Explain conductometric titration and its types in detail.
19. Explain properties, uses of Erythromycin and draw its structure and molecular formula.
20. Explain (i)Paints (ii) Thinner (iii)Binder (iv)Pigments

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DEPARTMENT OF CHEMISTRY
B.Sc. DEGREE EXAMINATION
MODEL QUESTION- ALLIED CHEMISTRY – II

Time: 3 hrs   **Max Marks: 75**
PART - A

Answer all the questions.   **10 X 2=20**
1. Define EAN rule.
2. Write any two application of ETDA.
3. Define iso-electric point.
4. Write the structure of glucose and fructose.
5. Define Batteries.
6. What are Galvanic cells?
7. Define anesthetics.
8. Draw the structure of aspirin.
9. Define dyes.
10. Give notes on vanderwaals interactions

PART - B
Answer all the questions.   **5 X 5 = 25**

11. (a) Write about the meanings of EDTA and its applications. (OR)

    (b) Explain Werner's theory
12. (a) Explain the preparation of amino acids by Gabriel method. (OR)
    (b) Write the preparation of glucose.
13. (a) Write the principle of Electroplating & its uses. (OR)
    (b) Explain the terms batteries
14. (a) State the mode of Action of paracetamol & ibuprofen. (OR)
    (b) Explain the analgesics
15. (a) Explain the classification of dye based on structure. (OR)
    (b) Explain the basic operations in dyeing process.

PART - C
Answer ANY three questions.   **3 X 10 = 30**

16. Explain the nomenclature of complexes IUPAC names.

17. Explain primary structure of proteins &its function
18. Explain electrochemical series.
19. Write the classification & Explain Anesthetics.
20. Write the preparation of Malachite Green & Crystal Violet.

VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN
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DEPARTMENT OF CHEMISTRY
SYLLABUS

Semester-III	**Total Hrs: 60**
Paper Code: 14U3CHC03	**Credit: 5**

CORE PAPER - III

GENERAL CHEMISTRY-III

OBJECTIVES

　　To enable the students to learn about the characteristics of transition elements, and the concept of thermodynamics.

Learning Outcome

Students will learn the general characteristics of transition elements and the extraction of various elements.

Students can understand the chemistry of hydrides and their uses.

Students will be enhanced their knowledge towards alcohols, phenols and aromatic hydrocarbons.

Students will learn the nature and reactions of carbonyl compounds.

Students will gain knowledge about basic terms involved in thermodynamics.

UNIT – I : Transition elements:　　　　　　　　　　　　　　　　　**(12)**

　　The d- block elements – Position in the periodic table - Electronic configuration - General characteristics of d - block elements. Occurrence- extraction, properties and uses of Ti, V and Pt. Chemistry of Titanium dioxide, Titanium Trichloride, TitaniumTetraChloride. Chemistry of Vanadium pentaoxide . Barium platino cyanides, Potassium Platino cyanides.

UNIT– II : Hydrides　　　　　　　　　　　　　　　　　　　　　　**(10)**

Hydrides – Classification of hydrides - Ionic Hydrides: LiH, NaH - preparation, properties, uses. Covalent Hydrides: Silanes - Chemistry of Mono and Disilanes - Boron hydrides - preparation properties and structure of Diborane. Complex Hydrides: $NaBH_4$, $LiAlH_4$ – structure, preparation properties and uses.

UNIT–V:Alcohols,phenols　　and　　aromatic hydrocarbons (13)

Aliphatic alcohols : Introduction – Nomenclature – Preparation, properties and distinguish between 1° , 2° and 3° alcohols -Aromatic alcohols: Introduction - preparation and properties of benzyl alcohol.

Phenol and its types : Introduction – acidity – preparation, properties and uses of phenol – Dihydric phenols: Introduction - preparation of catechol, resorcinol and quinol – Trihydric phenols: Introduction - preparation of pyrogallol, phloroglucinol - Houben-hoesch reactions.
Aromatic hydrocarbons
Aromatic hydrocarbons :The Huckel's rule - Electrophilic substitution reactions in aromatic compounds - general mechanism only.

UNIT– IV :Carbonyl compounds   (13)

        Introduction-Structure of carbonyl compounds-Nomenclature-Preparation and properties of aldehydes and ketones -Chemical property: Addition reactions, reactions involving Alkyl groups, Reduction and oxidation reactions and their some important reactions(Haloform, Cannizarro, Reformatsky, Wittig Reactions) – Chemistry of Acetone and acetaldehyde.

UNIT– V Thermodynamics – I   (12)

    Thermodynamic terms - system, surrounding and boundary -homogenous and heterogenenous system-types of thermodynamic system-state of system-equilibrium and non equilibrium state-Nature of Work and heat -law of conservation of energy - First law of thermodynamics -Enthalpy of a system – Heat capacity of a system - work done in reversible isothermal compression - work done in reversible adiabatic expansion - Joule Thomson effect, Joule Thomson coefficient – inversion temperature – zeroth law of themodynamics – absolute temperature scale

TEXT BOOKS

1) Madan.R.D., Inorganic Chemistry (3rd edition), New Delhi, S. Chand &Co., (2012).

2) Puri B.R., Sharma L.R., Pathania M.S., Principles of Physical Chemistry (23rdedition) New Delhi, S. Chand &Co., (2004).

3) Bahl B.S. and Arun Bahl, Advanced Organic Chemistry, (19th edition), New Delhi, S. Chand & Co., (2010).

REFERENCE BOOKS

4) Morrison R.T. and Boyd R.N., Organic Chemistry (6th edition), New York, Allyn & Bacon Ltd., (1992).

5) Puri B.R., Sharma L.R., Kalia K.K., Principles of Inorganic Chemistry (50th edition), New Delhi, S. Chand &Co., (2011).

6) Mukherji.S.M, Singh.S.P, Kapoor.R.P, Organic Chemistry volume – I (4th edition) New age International (p) limited (1998).

VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN

(AUTONOMOUS)

DEPARTMENT OF CHEMISTRY

SYLLABUS

Semester-IV	**Total Hrs: 60**
Paper Code: 14U4CHC04	**Credit: 5**

CORE PAPER - IV
GENERAL CHEMISTRY – IV

OBJECTIVES

To gain knowledge about nuclear chemistry, carboxylic acids, amines and second law of thermodynamics.

Learning Outcome

Students will learn the basic concepts of nuclear chemistry.

Students will know about the carboxylic acids and its derivatives .

Students will gain knowledge regarding preparation and properties of aliphatic and aromatic amines.

Students will enhance their knowledge towards entropy and free energy.

Students will acquire knowledge about enthalpy and their related concepts.

UNIT – I :Nuclear Chemistry (12)

Constitution of the nuclei – stable and unstable nuclei and their relationship to (n/p) ratio. Nuclear force's – . Natural radioactivity – modes of decay – Nuttal rule and average life – Radioactive equilibrium – Numerical problems. Mass defect and binding energy – Artificial transmutation and artificial radioactivity. Nuclear fission and nuclear fusion –Nuclear reactor-Hydrogen bomb-Application of radioactive isotopes- C^{14} dating, rock dating – Numerical problems – Isotopes as tracers – study of reaction mechanism in analytical chemistry, Medicinal Application.

UNIT– II :Carboxylic acids and derivatives (13)

General preparation and reactions of Monocarboxylic acid-Typical reactions of Dicarboxylic acid-Succinic,Maleic and Fumaric acid-hydroxyl acids-Lactic acid,Malic acid ,Tartaric and Citric acid-Aromatic acid-Phthalic acid.
Acid derivatives-preparations of Acid chlorides,Anhydrides,Esters and amides.

UNIT– III :Organic Nitrogen Compounds (13)

Aliphatic Amines:Nomenclature-Isomerism-Separation of amines by Hinsberg's and Hoffmann methods-General methods of Preparation and Properties of Amine.-Distinction between 1^0, 2^0 and 3^0 amines

Aromatic Amines:Basicity of Aromatic amine- Derivatives of aniline-Acetanilide-preparation properties. Diazonium compounds – Diazotization mechanism, Diazonium ion as weak electrophile-preparation & properties of diazoacetic ester .

UNIT– IV :Thermodynamics – II   (12)
Limitations of first law – Need for second law – Spontaneous process – cyclic process – Carnot cycle – efficiency – Carnot theorem –thermodynamic scale of temperature. Concept of Entropy – Units of Entropy-entropy a state function – entropy change in isothermal expansion of an ideal gas – Calculation of entropy changes of an ideal gas with changes in P, V & T. Entropy of mixture of ideal of ideal gases – physical significance of entropy. Work & free energy functions – partial molar free energy – Gibbs Duhem equation - Gibbs-Helmholtz equation - Clapeyron – Clausius equation. Applications of Clapeyron – Clausius equation. Third law of thermodynamics .

UNIT– V :Thermo chemistry   (10)
        Introduction – Change of enthalpy in a chemical reaction – Exothermic and endothermic reactions – Relation between heats of reaction at constant volume and pressure – Standard Enthalpy – Determination of enthalpies - Kirchoff's equation.– Hess's Law and its applications – measurement of enthalpy – Bond energy and its applications - Nernst Heat theorem-Standard free energy change- Vant Hoff reaction isotherm- Temperature dependence of the equilibrium constant-Vant Hoff Equation –Integrated form of Vant Hoff Equation.

TEXT BOOKS
1) G P Tuli, S. K Basu, R.D Madan Advance inorganic chemistry - Volume – I sathya prakash – S Chand company limited 2010
2) K.N Upadhyaya A text book of inorganic chemistry –-3rd edition.
3) S M Mukharji & S. P singh Reaction mechanism in organic chemistry -
4) Macmillan India limited – 2008
5) Essentials of Physical Chemistry-Arun Bahl,B.S.Bahl,G.D.Tuli S Chand company limited 2010

REFERENCE BOOKS
6) IL finar Organic chemistry volume – I sixth edition pearson Education- 1973.
7) Bahl & Arun Bahl Advance organic chemistry — S.Chand – 2010
8) B K Puri & Sharma, Pathania Principle of physical chemistry– 37th edition-
9) Nagin chand & Co – 1997.
10) J Rajaram & J C Kuriacose Thermodynamic for students of chemistry — Lal Nagin Chand – 1986.
11) P.S.Kalsi Organic Reaction and Their Mechanism -2010 New Age international   Publisher
12) P.L. Soni A text book of inorganic chemistry 1997 Sultan Chand and sons.

Semester- III/IV	**Total Hrs: 60**
Paper Code: 14U4CHP02	**Credit:5**

CORE PRACTICAL- II
MAJOR CHEMISTRY PRACTICAL-II
[INORGANIC QUALITATIVE ANALYSIS]

OBJECTIVES

1 .To understand the principles of qualitative analysis.

2. To enable the students to understand the techniques to remove interfering from non interfering radicals.

Learning Outcome

Students will learn how to separate the cations and anions systematically.

Students will gain the knowledge about group separation of various cations.

The students will enable to acquire knowledge about interfering and non interfering ions.

I. ANALYSIS OF INORGANIC MIXTURE HAVING ONE INTERFERENCE AND ONE NON-INTERFERENCE ACID RADICALS, TWO BASIC RADICALS.

ANIONS TO BE ANALYSED: Carbonate, Sulphate, Nitrate,Chloride, Bromide, Fluoride Chromate, Borate, Oxalate, Phosphate radicals.

CATIONS TO BE ANALYSED: Lead, Bismuth, Copper, Cadmium, Chromium, Aluminium, Manganese, Cobalt, Nickel, Zinc, Barium, Strontium, Calcium, Magnesium, Ammonium radicals.

II. INORGANIC PREPARATIONS

1. Micro-Cosmic salt.
2. Potassium trioxalatochromate(III)
3. Ferrous Ammonium sulphate.
4. Tetramminecopper sulphate(II)
5. Tris thiourea copper chloride(I)

TEXT BOOKS & REFERENCE BOOKS

1) G.Suehla, Vogel's qualitative Inorganic analysis VI edition Orient Longmann, 1987.

2) V.V.Ramanujam Inorganic Semimicro qualitative analysis, National Publishing Co Chennai, 1971.

3) Basic Principles of Practical chemistry V.Venkateswaran, R.Veeraswamy.A.R.Kulandaivelu, S.Chand and Sons, NewDelhi,2004.

VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN
DEPARTMENT OF CHEMISTRY
(AUTONOMOUS)
SYLLABUS

Semester-III	**Total Hrs: 30**
Paper Code: 14U3CHN01	**Credit: 2**

NON MAJOR ELECTIVE COURSE-I
INDUSTRIAL CHEMISTRY – I

OBJECTIVES

To enable the students to learn about the various industries and their applications.

Learning Outcome

Students will be known the various methods involved in water quality analysis.

Students can understand the manufacture of soap and detergents.

Students will be enhanced their knowledge towards manufacture of glass.

Students will learn the basic concepts involved in lubricants.

Students will gain knowledge about petroleum products.

UNIT –I :Fertilizer (6)

Fertilizer- need for Fertilizer- Classification of fertilizer -Organic and Inorganic Fertilizers. Nitrogeneous Fertilizer-Ammonium nitrate-Urea,CAN (calcium ammonium nitrate) Phosphate Fertilizers-Super Phosphate,Triple Super Phosphate, NPK.

UNIT-II :Soaps and detergents (6)

Soaps: manufacture- toilet and transparent soaps- metal soaps, cleansing action of soap. Detergents:Manufacture of synthetic detergents-anionic detergents-cationic detergents and amphoteric detergents.

UNIT–III :Agrochemicals (6)

Insecticides-Herbicides –Fungicides -Rodenticides –Nematicides with examples each, Bordeaux mixture and sulphur compounds –methods of using pest control -pest control chemicals.

UNIT–IV :Sugar Industry (6)

Introduction- manufacture of cane sugar- extraction of juice purification of juice- defection-sulphitation and carbonation- concentration- crystallization- separation of crystals-drying-refining-grades-recovery of sugar from molasses-Sugar industries in India.

UNIT–V :Petroleum and Petrochemicals (6)

Cracking –mechanism,changes occurring during cracking-types-applications- synthetic petrol-Hydrogenation of coal (Bergius process)- Fischer tropsch process- knocking and anti knocking agents -octane number.

TEXT BOOKS

1. Industrial chemistry by B.N.Chakrabarty, Oxford and IBH publishing Co, NewDelhi,1981.

2. Industrial chemistry by B.K.Sharma,Goel Publishing House,Meerut.

REFERENCE BOOKS

3. College Industrial chemistry by P.P.Singhn, T.M.Joseph, R.G.Dhanvale, Himalaya Publishing house, Bombay 4th edition,1983
4. Applied chemistry by Jayashree Ghosh ,S.Chand Publication Reprint 2013

Semester – IV	Total Hrs: 30
Paper Code: 14U4CHN02	Credit: 2

NON MAJOR ELECTIVE COURSE-II
INDUSTRIAL CHEMISTRY – II

OBJECTIVES

To enable the students to learn about the various industries and their applications.

Learning Outcome

Students will be known various non conventional energies such as solar energy , wind energy etc.,

Students can understand synthetic rubber and polymers

Students will be enhanced their knowledge towards conversion of hard water into soft water.

Students will learn the basics of dairy chemistry.

Students will gain knowledge about various types and manufacture of cement.

Unit-I: Non-Conventional Energy Sources & Storage Devices : **(6)**

Introduction of solar energy–solar cell-advantage and disadvantages-solar energy programme in India-Lead Acid Storage cell- uses of lead acid storage cell-battery-types - characteristics of a battery-wind energy-generation of electricity through wind mills- advantage and disadvantages wind mills.

Unit-II :Polymer and rubber **(6)**

PVC-preparation, properties and uses--Teflon-preparation, properties and uses. Rubber-natural rubber-vulcanisation of rubber-advantages of vulcanization-synthetic rubber - Elastomers. Buna-s - preparation, properties and uses-applications of rubber.

Unit-III :Water technology **(6)**

Introduction –hard and soft water-units of hardness, sofenting of hardwater-zeolite/permutit process, ion-exchange, electrodialysis-boiler compounds-desalination of brackish water-reverse osmosis-Recycling of Effluent water.

Unit –IV: Dairy Chemistry **(6)**

Composition of milk- physical properties of milk - Pasteurisation-effect of heat -types and uses of dry milk-milk product –Ice cream and butter.

Unit-V :Cement Industry **(6)**

Lime: Types –Manufacture-Properties, Cement: Types –Manufacture of Portland cement. Setting and hardening of Portland cement-Gypsum –Plaster of Paris- Grading of cement, Adhesives-Definition-Types-advantages-disadvantages.

TEXT BOOKS
   1. B.N.Chakrabarty, Industrial Chemistry, Oxford & IBH Publishing Co, New Delhi, 1981.
2. B.K.Sharma, Industrial Chemistry, Goel Publishing House, Meerut.
   3. P.P.Singh, T.M.Joseph, R.G.Dhanvale, College Industrial Chemistry, Himalaya
      Publishing House, Bombay,4th Ed., 1983
   4 .Dr.P.Kamaraj ,M.Arthanareeswari,Second Edition 2003,Sudhanandhira Publications
RFERENCE BOOKS
   1.A.Ravikrishnan, Engineering Chemistry -1 ,Sri Krishna Publications., 2008
   2.Jayashree ghosh, Applied chemistry

VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN
(AUTONOMOUS)
DEPARTMENT OF CHEMISTRY
B.Sc. DEGREE EXAMINATION - III SEMESTER
MODEL QUESTION- GENERAL CHEMISTRY – III

Time: 3 hrs   **Max Marks: 75**

PART - A

Answer all the questions   10 X 2=20

1. What are the ores of Titanium?
2. How is Vanadium pentoxide prepared?
3. Define Hydrides? Give on example
4. Write the uses of Lithium Aluminium Hydride
5. State Huckel's rule
6. Differentiate any two reactions of Phenol and alcohol.
7. Define Joule Thomson effect.
8. State Law of conservation of energy.
9. Define standard free energy.
10. Write Vant Hoff of equation and explain its terms.

PART - B

Answer all the questions   5 X 5 = 25

11. (a) Write the preparation & properties of TiO_2 (OR)
    (b) How will you prepare Barium Platino cyanide? Mention the properties.
12. (a) Write short note on monosilanes.   (OR)
    (b) Write the preparation, properties & structure of $LiAlH_4$.
13. (a) How will you distinguish primary , Secondary and tertiary alcohols.   (OR)
    (b) Write the preparation, properties and uses of pyrogallol & hydroxyl quinol.
14. (a) Explain the Chemical properties of Aldehydes .   (OR)
    (b)Explain mechanism of Haloform reactions.
15.a)Explain the Work done in Reversible Isothermal Compression.   (OR)
    (b) Explain Joule Thomson Effect and Joule Thomson coefficient.

PART - C

Answer ANY three questions.   3 X 10 = 30

16. Discuss the extraction of Molybdenum.
17. Explain the structure of diborane.
18. Explain the preparation and properties of dihydric Phenol.
19. Compare the chemistry of Acetone and Acetaldehyde.
20. Derive Kirchoff Equation.

VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN
(AUTONOMOUS)
DEPARTMENT OF CHEMISTRY
B.Sc. DEGREE EXAMINATION – IV SEMESTER
MODEL QUESTION- GENERAL CHEMISTRY – IV

Time: 3 hrs **Max Marks: 75**
PART - A
Answer all the questions. **10 X 2=20**
1. Why is $_{92}U^{238}$ not suitable for chain reaction?
2. What is mass defect?
3. Write any two chemical reaction of Tartaric acid.
4. Write any two derivative preparation of acid.
5. Why benzene diazonium ion a weak electrophile?
6. Give the two preparation of aniline.
7. List the Limitations of first law of thermodynamics.
8. Write the Units of Entropy.
9. Define Standard free energy.
10.State Hess's Law.

PART - B
Answer all the questions. **5 X 5 = 25**
11.(a) Explain Geiger-Nuttal rule with examples. (OR)
    (b) Explain nuclear stability with respect to n/p ratio.
12.(a)Give the preparation and properties of Succinic acid. (OR)
    (b). Give the preparation and properties of Citric acid .
13.(a) How are aliphatic amines separated by Hofmann's and Hinsberg's methods . (OR)
    (b). Explain the mechanism of diazotisation .
14. a). Derive the Gibb's Duhem equation. (OR)
    (b) Explain the Entropy.
15. a) Write the determination methods of enthalpy .(OR)
    b) Derive Van't Hoff reaction isochore .

PART - C
Answer ANY three questions. **3 X 10 = 30**
16. Write note on nuclear fusion , nuclear fission and stellar energy.
17. (i) Explain with mechanism of ester hydrolysis?
    (ii) Give the preparation and properties of Lactic acid.
18. Give the synthetic uses of diazoacetic ester and state why the diazonium ion as weak
     Electrophile.
19. Derive Gibbs-Helmholtz equation.
 20. Explain the followings (i) bond energy and its applications.
                                    (ii) Kirchoff's equation.

B.Sc. DEGREE EXAMINATION – III SEMESTER
MODEL QUESTION- NON MAJOR ELECTIVE COURSE-I
INDUSTRIAL CHEMISTRY-I

Time: 3 hrs   **Max Marks: 75**
PART - A
                              Answer all the questions.   **10 X 2=20**

1. Define Fertilizer with example.

2. Write the structure of CAN.
3. What are detergents?
4. Mention the uses of detergents.
5. Give some examples for herbicides and insecticides.
6. Define rodenticides.
7. What you mean by molasses?
8. Write the manufacture of sugar (steps only).
9. Write the different types of cracking.
10. What do you meant by synthetic petrol.?

PART - B
Answer all the questions.   **5 X 5 = 25**

11. (a) Write the composition and uses of triple super phosphate.   (OR)

     (b) Write the uses of urea and CAN.
12. (a) Write short notes on detergents.   (OR)
     (b) Write a note on cleaning action of soap.
13. (a) Write short note on herbicide and insecticides   (OR)
     (b) Briefly discuss about Bordeaux mixture and sulphur compounds.
14. (a) Explain the crystallization process of sugar.   (OR)
     (b) Explain the process of manufacture of sugar.
15. (a) Explain the changes occur during cracking.   (OR)
      (b) Explain the application of petroleum in cracking.

PART - C
                              Answer ANY three questions.   **3 X 10 = 30**

16. Explain organic and inorganic fertilizers in detail.
17. Explain soaps& detergents in detail.
18. Explain the methods of using pest control chemicals and pest control.
19. Explain the history of sugar industry in India.
20. Explain Bergius process and Fischer Tropsch process of petroleum.

14U4CHN02

(AUTONOMOUS)
DEPARTMENT OF CHEMISTRY
B.Sc. DEGREE EXAMINATION – IV SEMESTER
MODEL QUESTION- NON MAJOR ELECTIVE COURSE-II
INDUSTRIAL CHEMISTRY-II

Time: 3 hrs   **Max Marks: 75**
PART - A
                          Answer all the questions.   **10 X 2=20**

1. Write the uses of lead acid storage cell.
2. Define wind energy.
3. Write the uses of Teflon.
4. Write the properties of rubber.
5. Define reverse osmosis.
6. What do you mean by electro-dialysis
7. Write any two physical properties of milk.
8. Write the uses of dry milk.
9.   List out the types of Cement.
10. Define Adhesives

PART – B
Answer all the questions.   **5 X 5 = 25**

11. (a) Explain the advantages and disadvantages of solar cell.   (OR)

(b) Write the types of battery and its characterisitics in detail
   12. (a) Write the preparation, properties and uses of PVC .   (OR)
(b) Explain vulcanization of rubber.
   13. (a) Explain Desalination of brackish water.   (OR)
      (b) Explain softening of hard water.
   14. (a) Write short notes on effect of heat on milk.   (OR)
        (b)Write short notes on pasteurization
   15. (a) Explain the process of setting of cement .   (OR)
      (b)What are Advantages and Disadvantages of adhesives.

PART - C
                          Answer ANY three questions.   **3 X 10 = 30**   .

 16. Explain solar energy programme in India.
 17. Explain the preparation, properties and uses of Buna-s rubber
 18. Explain hard and soft water in detail
 19. Explain the types and uses of dry milk.
 20. Explain the manufacture process of Portland Cement

VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN
(AUTONOMOUS)
DEPARTMENT OF CHEMISTRY
SYLLABUS

Semester- V	**Total Hrs: 60**
Paper Code: 14U5CHC05	**Credit: 5**

CORE PAPER - V
ORGANIC CHEMISTRY

OBJECTIVES

1. To gain knowledge about optical and geometrical isomerism.

2. Acquire the knowledge about heterocycles.

3. To understand the reaction mechanism and reagents in organic synthesis.

Learning Outcome

Student will be able to get an insight into basic concept of optical isomerism .

Students will have a firm foundation in the fundamentals of heterocyclic chemistry, methods of synthesis and

application of those methods for the preparation of specific groups of heterocyclic systems.

Students will be skilled in solving the problems related to isomerisms.

Students will have a clear understanding of mechanisms in organic reactions.

Students will be skilled enough to choose a reagent to carry out organic reactions.

UNIT – I (12)
1.1 **Stereo Isomerism** - Definition- classification- optical and geometrical isomerism.
1.2 **Optical isomerism**- optical activity-specific rotations- condition for optical activity- asymmetric centre-chirality-chiral molecules-meaning of (+) and (-) and D and L notations-elements of symmetry.
1.3 Projection formula -Fischer, Flying wedge, Saw Horse and New Mann projection formula-notation of optical isomers- Cahn – Ingold - Prelog rules - R-S notation for optical isomers with one and two asymmetric carbon atoms-erythro and threo representations.
1.4 Racemisation – Methods racemisation (by substitution and tautomerism) - Resolution – methods of resolution (mechanical, seeding, biochemical and conversion to diastereoisomers). Asymmetric synthesis (partial and absolute synthesis), Walden inversion.
1.5 Optical activity of allenes, spiranes and biphenyls.

UNIT – II (12)
2.1 **Geometrical isomerism –** cis-trans, syn-anti and E-Z notations- geometrical isomerism in maleic and fumaric acids and unsymmetrical ketoximes-methods of distinguishing geometrical isomers using melting point,dipole moment,dehydration,cyclisation and heat of hydrogenation.
2.2 **Conformational analysis** - Conformationl analysis of cyclohexane (chair, boat and skew boat forms) - axial and equatorial bonds-ring flipping showing axial and equatorial interconversions-

conformers of mono and disubstituted cyclohexanes-1:2 and 1:3 interactions-conformation and stereochemistry of cis and trans decalines.

UNIT – III (12)
UV-VIS spectroscopy

Theory-Instrumentation-Beer-Lamberts Law – bands in UV-VIS spectrum – possible electronic transitions – types of electronic transitions based on selection rules – characteristic absorption (λ_{max} and ε_{max}) of carbonyl , isolated double bond, conjugated double bond systems and aryl groups – factors influencing the absorption – Spectroscopic terms: Chromophore, Auxochrome, Bathochromic shift, Hypsochromic shift, Hypochromic shift, Hyperchromic shift.

UNIT – IV (12)
Heterocyclic compounds
4.1 General classification-aromatic and non-aromatic heterocyclics.
4.2 Molecular orbital picture,aromatic character, preparation, properties and uses of pyrrole,furan,thiophene and pyridine.
4.3 Condensed five and six membered heterocyclics-preparation and properties of indole,benzofuran,quinoline and Isoquinoline.

UNIT – V (12)
Reagents in Organic Chemistry

Important reagents and their applications in organic chemistry - $LiAlH_4$, $NaBH_4$, $Na/liq.NH_3$, $Zn/Hg-HCl$, $H_2N.NH_2/EtONa$, HIO_4, Aluminium isopropoxide, NBS, $Pb(OAc)_4$ and OsO_4.

TEXT BOOKS
1. Finar I.L, Organic chemistry Vol I sixth edition, ELBS, Pearson Education Ltd.,2004
2. Finar I.L, Organic chemistry Vol II fifth edition, ELBS, Pearson Education Ltd.,2012
3. O.P.Agarwal, Reactions and Reagents, Krishna prakashan media (p) Ltd., 1975
4. Y.R.Sharma, Elementary Organic Absorption Spectroscopy – principles and chemical applications, S.Chand and Co., 2006.
5. Kalsi.P.S, Stereochemistry, Conformation and Mechanism, New Age International (p) Ltd, VIIth, 2008.
6. Nasipuri. D, Stereochemistry of organic compounds, second edition, Wiley Eastern Ltd., 1994.
7. Bhal B.S and Arun Bhal- a text book of organic chemistry, S.Chand & company ltd, 1948.
8. V.K.Ahluwalia, Rakesh kumar, Parashar.R.K, Organic reaction and mechanism, IVth edition, Narosa publishing house pvt Ltd., 2011.

REFERENCES
1. K.S.Tewari, and N.K.Vishoni, Organic Chemistry, Vikas Publishing House.
2. Soni.P.L and Chawla.H.M. Text book of organic chemistry, 26th revised edition, Sultan chand and sons, 1995.
3. R.T.Morrison and Boyd, Organic Chemistry, VIth edition, PHI Learning Pvt Ltd., 2008.

VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN
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DEPARTMENT OF CHEMISTRY
SYLLABUS

Semester- V	**Total Hrs: 60**
Paper Code: 14U5CHC06	**Credit: 5**

CORE PAPER - VI
INORGANIC CHEMISTRY – I

OBJECTIVES

1. To help the student to understand the basic concepts in inorganic chemistry and to develop their critical thinking.

2. To learn the basics and applications of the inorganic compounds.

Learning Outcome

Students will master the basics in inorganic chemistry of acids & bases, solvents and coordination complexes.

Students will have basic understanding on the chemistry of inorganic complexes.

Students will be able to interpret the applications of inorganic compounds in day to day life.

UNIT-I: Modern Concepts of Acids and Bases (12)
   Acids and Bases – Arrhenius concept – Bronsted - Lowry concept - Luxflood concept - Lewis concepts of acids and bases - Usanovich concept - Conjugate acid - base pairs – Relative strength of acids and bases: Hydracids & Oxyacids – Levelling & Differentiating solvents - Solvent system concept.
   Hard and Soft Acids and Bases - Classification of acids and bases as hard and soft – examples - Pearson's HSAB Principle and its applications.

UNIT – II: Non-Aqueous Solvents (12)
   Classification of solvents – General Characteristics of a solvent, Reaction in non aqueous solvents with reference to liq NH_3, Solutions of alkali metals in ammonia, liq SO_2, liq. N_2O_4, anhydrous H_2SO_4, liq.HF, and molten salts.

UNIT-III: Chemistry of f-Block Elements (12)
   Position in the periodic table - general characteristics of Lanthanides and Actinides- Lanthanide contraction and its consequences - Isolation of Lanthanides from monazite including the Ion exchange resin methods – Actinides - occurrence and preparation - Chemistry of thorium and uranium – important compounds – preparation, properties and uses of Uranyl nitrate, Uranium hexa fluoride, Thorium dioxide and Thorium nitrate - Comparison of Lanthanides and Actinides.

UNIT-IV: Coordination Chemistry-I (12)
   Definition and classification of ligands - Nomenclature of mononuclear and poly nuclear complexes - chelating ligands – chelate effect - coordination number and stereochemistry of

complexes - Isomerism in complexes - structural isomerism - stereo isomerism – geometrical isomerism and optical isomerism in 4 and 6 coordinated complexes - Werner's theory & its evidences - Sidgwick theory – EAN rule and its applications.

UNIT-V: Coordination Chemistry-II (12)

Theories of bonding in complexes: VB theory – postulates - Hybridization and Geometries of complexes - Outer orbital and inner orbital octahedral complexes - Square planar - tetrahedral complexes - Magnetic properties of complexes - limitations of VB theory.

Crystal Field Theory – postulates - d orbital splitting in octahedral, tetrahedral and square planar complexes - strong and weak field ligands - Spectro chemical series - High spin and Low spin complexes – Colour and Magnetic properties of complexes - CFSE and its uses - Limitations of CFT-Comparison between VBT and CFT.

TEXT BOOKS

1. Puri, Sharma, Kalia, Principles of Inorganic Chemistry 32nd Edition (2014), Milestone Publishers and Distributor, New Delhi.
2. Wahid. U. Malik, G. D. Tuli, R. D. Madan, Selected topics in Inorganic Chemistry, S.Chand & company, New Delhi.
3. R. D. Madan, Satyaprakash's Modern Inorganic Chemistry (1987), S. Chand Publishing, New Delhi.

REFERENCE BOOKS

1. Satya Prakash, G.D. Tuli, S.K. Basu and R.D. Madan, Advanced Inorganic Chemistry – Vol – I (2006), S. Chand Publishing, New Delhi.
2. Satya Prakash, G.D. Tuli, S.K. Basu and R.D. Madan, Advanced Inorganic Chemistry – Vol – II (2006), S. Chand Publishing, New Delhi.

VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN
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DEPARTMENT OF CHEMISTRY
SYLLABUS

Semester- V	**Total Hrs: 60**
Paper Code: 14U5CHC07	**Credit: 5**

CORE PAPER – VII
PHYSICAL CHEMISTRY

OBJECTIVES

Facilitate the students to study about the nature of solutions, kinetics of reactions and learn the concepts of chemical equilibrium.

Learning Outcome

Students will learn the laws of solutions and deviations of solution w.r.t. pressure, temperature and volume.

Students can understand fundamental concepts of chemical equilibrium.

Students will have enhanced knowledge towards advanced conception of chemical equilibrium.

Students will able to understand and explain the theories of chemical kinetics.

Students will be skilled in solving the problems of Kinetics.

UNIT-I   Solutions (12)
- 1.1. Solutions of gases in liquids- Henry's law- solutions of liquids in liquids- Raoult's law.
- 1.2. Ideal solution- Binary liquid mixture- -deviation from ideal behavior-Thermodynamics of ideal solutions-V-P- composition curves, V-P- temperature curves- Azeotropic distillation.
- 1.3. Nernst's distribution law- Thermodynamic derivations, applications.
- 1.4. Thermodynamic derivation of elevation of boiling point and depression of freezing point- Van't Hoff factor- Abnormal molecular mass.

UNIT-II   Chemical Equilibrium- I   (12)
- 2.1. Reversible reactions-nature of chemical equilibrium: definition-Characteristics of chemical equilibrium – Law of mass action.
- 2.2. Equilibrium Law - Derivation-equilibrium constant expression in terms of general and equilibrium constant expression in terms of pressure- Heterogeneous equilibrium – Related problems.
- 2.3. Standard free energy change - Thermodynamic derivation of law of chemical equilibrium- K_p, K_c and K_x- Relations between K_p, K_c and K_x - Problems related to K_p and K_c.

UNIT-III   Chemical Kinetics-I (12)
- 3.1. Chemical kinetics and its scope - rate of a reaction, factors influencing the rate of the reaction.
- 3.2. Order and molecularity of a reaction: Definition, types – difference between order and molecularity - Derivation of rate constant and half life period for zero, first order

reactions - Derivation of rate constant and half life period for second and third order reactions (when the reactants are taken at the same and different initial concentrations).

      3.3. Methods to determine the order of the reaction – Isolation and half life methods.

      3.4. Kinetics of complex reactions.

UNIT-IV   Chemcial Kinetics-II (12)

      4.1. Theories of chemical kinetics : Arrhenius equation, effect of temperature on rate of reaction, concept of activation energy.

      4.2. Collision theory of reaction rates- introduction, Derivation of rate constant for bimolecular reaction from collision theory, Failures of CT.

      4.3. Lindemann theory- introduction, Derivation of rate constant for unimolecular reaction.

      4.4. Theory of absolute reaction rates- introduction, Thermodynamic derivation of rate constant for bimolecular reaction based on ARRT.

UNIT-V   Photochemistry (12)

      5.1. Interaction of radiation with matter - difference between thermal and photochemical processes.

      5.2. Laws of photochemistry – Beer-lambert's Law, Grothus - Draper law, Stark-Einstein law.

      5.3. The Jablonski diagram depicting various photo physical processes occurring in the excited state- Radioactive (Fluorescence and Phosphorescence) and non-radioactive (Internal Conversion and Inter system crossing) processes.

      5.4. Quantum yield – Definition, determination – law of photochemical equivalence.

      5.5. Photochemical reactions - Kinetics of hydrogen-bromine reaction-decomposition of HI.

TEXT BOOKS

1. Arun bahl, B.S.bahl and G.D.tuli, Essentials of physical chemistry, Revised edision, S.Chand publication New Delhi, 2010.
2. B.R.Puri, L.R.Sharma and M.S. Pathania, Principles of Physical Chemistry, Vishal Publishing Co, Jalandhar, 2008.
3. N.Kundu and S.K.Jain, Physical Chemistry, S.Chand & Company Ltd, New Delhi, 1990.

REFERENCE BOOKS

1. Peter Atkins and Julio de Paula, Physical Chemistry, 7th Edn, Oxford University Press, New York, 2002.
2. J Rajaram and JC kuriacose, kinetics and mechanisms of chemical transformations, First edision, Macmillan publishers india ltd New Delhi, 2011.
3. RP rastogi and RR misra, an introduction to chemical thermodynamics, 6 th revised edision, vikas publishing house pvt ltd new Delhi 2005.
4. KK rohatgi-mukherjee fundamentals of photochemistry, revised edision, new age international pvt ltd New Delhi 2003.

Semester-V   **Total Hrs: 60**
Paper Code: 14U5CHE01   **Credit: 5**

ELECTIVE COURSE-I
ANALYTICAL CHEMISTRY

OBJECTIVES

1.   To help the student to develop the habit of accurate manipulation and an attitude of

critical thinking.

2.   To learn the basic analytical methods and appreciate what is involved in an analysis.

Learning Outcome

Students will utilize the learned analytical skills in handling various chemical and biochemical instruments.

Students will have basic understanding on purification and separation techniques.

Students will have a thorough understanding of thermal and electro analytical techniques.

Students will be able to interpret the results of quantitative experiments and interpret the data in meaningful

way.

UNIT-I: Laboratory Hygiene and safety (12)
1.1 Storage and handling of corrosive, flammable, explosive, toxic, carcinogenic and poisonous
    chemicals.
1.2 Simple first aid procedures for accidents involving acids, alkalies, bromine, burns and cut by
    glass. Threshold vapour concentration - safe limits. Waste disposal**.**

UNIT-II: Gravimetric Analysis (12)
2.1 Principle-theories of precipitation-solubility product and precipitation-factors affecting
    solubility product-Condition of precipitation-Co-precipitation &post-precipitation, Reduction of
    errors. Precipitation from homogeneous solution-washing and drying of precipitate.
2.2 Choice of the precipitant-specific and selective precipitant, Anthranilic acid, Cupferon, DMG,
    ethylenediamine, 8-hydroxyquinoline, salicylaldoxime-use of masking and demasking agent.
2.3 Crucibles-types, care and uses. Calculation in gravimetric analysis-use of gravimetric factor.

UNIT-III: Purification Techniques (12)
3.1 Dessicant: Types of dessicant: Relative efficiencies of dessicant, drying power and temperature,
    Regeneration of dessicant, choice of dessicants - Technique of drying: Drying of solids.
3.2 Distillation: Theory of distillation; Technique; fractional distillation, Steam distillation,
    Azeotropic,Vaccum – Recrystallisation - Sublimation.

UNIT-IV: Chromatographic Techniques-I (12)

4.1 TLC –Principle, Choice of adsorbent and solvent, preparation of chromatoplates, Rf-value, factors affecting the Rf values. Significance of Rf value.

4.2 Introduction - Adsorption Chromatography - Partition Chromatography - Column Chromatography - principle, types of adsorbents, preparation of the Column, elution, recovery of substances and applications.

4.3 Ion-exchange chromatography-principle-types of resins-requirements of a good resin – action of resins- experimental techniques-separation of Na-K, Ca-Mg, Co-Ni, and Chloride Bromide.

UNIT-V: Chromatographic Techniques-II (12)

5.1 Paper chromatography-principle, solvents used, development of chromatogram- ascending, descending and radial paper chromatography. paper electrophoresis- separation of amino acid and other applications.

5.2 Gas Chromatography (GC)-principle-types-experimental techniques-instrumentation and applications.

5.3 High pressure liquid chromatography (HPLC)-principle-experimental techniques – instrumentation and advantages

TEXT BOOKS

1. Bassett.J, Denney, R.C,Jaffery.G.H and Mendhan.J, Vogel s Hand Book of Qualitative in organic Analysis ELBS-Longman.
2. Gopalan.R, Subramaniaam.P.S, and Rengarajan.K,Elemants of Analytical chemistry-Sultan Chand &Sons.
3. B.K. Sharma, Analytical Chemistry, Krishna Prakashan media (p) ltd.

REFERENCE BOOKS

1. Janarthanam.P.B, Physico-Chemical Techniques of Analysis Vol I & II- Asian Publishing House Bombay.
2. Ramachandra Sastry.A,Analytical Chemistry – K.C.S.Desikan &Co.
3. Walter E Harris Brgron Kratochvil-An introduction to chemical Analysis.
4. Douglas A,Skoog and Donal M. West Hort, Fundamentals of analytical chemistry, Rinechan and Winston inc., Newyork.

Semester-V	**Total Hrs: 30**
Paper Code: 14U5CHS01	**Credit: 3**

SKILL BASED ELECTIVE COURSE-I
SPECTROSCOPY

OBJECTIVES

Students acquire the knowledge about the fundamentals and different types of spectroscopy .

Learning Outcome

Students know principle, instrumentation and applications of Rotational spectroscopy.

Students can able to learn theory, laws, types of band and applications of IR Spectroscopy.

Knowledge of students will be developed in the field of Raman spectroscopy by the learning of Scattering, stokes and

anti stokes line etc.

To understand the concept of NMR spectrum and its applications.

Students have an idea of different types of peak, Nitrogen rule and fragmentation of Mass spectroscopy.

UNIT – I
Spectroscopy (6)

Fundamental concepts electromagnetic spectrum -type of changes induced by the interaction of radiation with matter. **Rotational Spectroscopy** - Principle-Instrumentation-Selection rules for rotational spectroscopy - Molecular rotation-diatomic molecule as rigid rotor-diatomic molecule as non-rigid rotor-. Applications of rotation spectra: bond length-isotopic substitution.

UNIT – II
IR spectroscopy (6)

Theory-Instrumentation- Hooke's Law – bands in IR spectrum - Number and types of fundamental vibrations-Modes of vibrations and their energies- Factor affecting the frequency of absorption-Conjugation, inductive effect and hydrogen bonding.

UNIT – III
Raman spectroscopy (6)

Rayleigh scattering and Raman scattering - Stokes and anti-stokes lines in Raman spectra - Raman frequency - condition for a molecule to be Raman active - Comparison of Raman and IR spectra.

UNIT – IV
NMR spectroscopy (6)

Nuclear spin and conditions for a molecule to give rise to NMR spectrum- Theory of NMR spectra-Instrumentation- Number of NMR signals - shielding, de-shielding, chemical shift, TMS & its applications, peak area and number of protons –splitting of signals-spin-spin coupling.

UNIT – **V**
Mass spectroscopy (6)

Basic Principles – Molecular ion peak, metastable peak, base peak and isotopic peak – their uses- Nitrogen rule-Ring rule–Fragmentation of alkanes, alkenes, cycloalkane and alcohol – McLafferty rearrangement.

TEXT BOOKS
1. Chatwal Anand, Instrumental methods of chemical analysis, Himalaya Publishing, 1980.
2. Y.R.Sharma, Elementary Organic Absorption Spectroscopy – principles and chemical applications, S.Chand and Co., 2006.
3. K.V.Raman, R.Gopalan and P.S.Ragavan, Molecular spectroscopy, K.V.Raman, R.Gopalan and P.S.Ragavan Thomson Publications, 2004.

REFERENCE BOOKS

1. Collin N.Banwell, Mc Cash and M.Elaine, Fundamentals of Molecular Spectroscopy, Tata Mc.Graw Hill Publishing, New Delhi, 1994.
2. Jag Mohan, Organic Analytical Chemistry, Narosa Publishers, 2003.
3. William Kemp, Organic Spectroscopy, 3 rd Edition, Palgrave publishers, 2007.
4. Robert M. Silverstein, Francis X.Webster, David J. Kiemle, David L. Bryce, Spectrometric Identification of Organic Compounds, 8th Edition, 2015.
5. G. Aruldhas, Molecular Structure and Spectroscopy, PHI Learning Pvt. Ltd., 2004.

Semester- **V**	**Total Hrs:30**
Paper Code: 14U5CHS02	**Credit: 3**

SKILL BASED ELECTIVE COURSE- II
DYE CHEMISTRY

UNIT – I (6)

Colour and Constitution - Relationship of colour observed to wavelength of light absorbed – Terms used in colour chemistry – chromophores, Auxochromes – Bathochromic shift, Hypsochromic shift. Quinonoid theory

UNIT – II (6)

Chemistry of organic intermediates used in dye manufacture – Benzene, Naphthalene and Anthraquinone intermediates– Nitro dyes, Nitroso dyes, Azo dyes – principles governing azo coupling – mechanism of diazotization coupling with amines, coupling with phenols– Classification according to the number of azo groups and application – Tautomerism in azo dyes.

UNIT – III (6)

Structure, Properties and Uses -Acid dyes – malachite green, crystal violet, Eriochrome Black T, Metanil Yellow, Congo red, Basic dyes – picric acid, eosin, methylene blue, Neutral dyes – neutral red, Indigo, Alizarine, Sulphur black – T.

UNIT – IV (6)

Synthesis, reactions and applications of xanthene dyes – Cyanine dyes, Acridine dyes, Sulphur dyes – Anthraquinone dyes: Anthraquinone mordant dyes, Anthroquinone acid dyes and Anthraquinone disperse dyes.

UNIT – V (6)

Pigments – Introduction - Requirements of organic pigments Types of Pigments – Applications. Fluorescent. Brightening agents – application of dyes in other areas – Leather, paper, medicine, chemical analysis, cosmetics, colouring agents.

TEXT BOOKS

1. K. Venkataraman, The chemistry of synthetic dyes volume I, II, III, IV by Third and fourth edition.

2. Gurdeep R. Chatwal, Synthetic Dyes, Himalaya publishing house, Reprint 2009.

REFERENCE BOOKS

1. B.K. Sharma, An introduction to industrial chemistry, Chemical engineering 16th Meerut, Krishnaprakasam media, 2011.

14U5CHC05

VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN
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DEPARTMENT OF CHEMISTRY
B.Sc. DEGREE EXAMINATION - V SEMESTER
MODEL QUESTION- ORGANIC CHEMISTRY - I

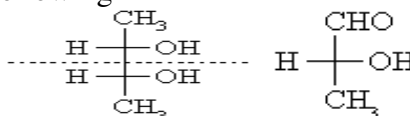**Time: 3 hrs**   **Max Marks: 75**

PART - A
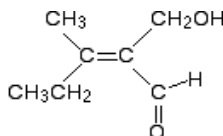### Answer all the questions.   10 X 2=20

1. Write the Fischer projection formula for tartaric acid.
2. Find R (or) S Notation of the following

3. Find E or Z of the following

4. What is Torsional strain?
5. State Beer Lamberts law.
6. What is meant by Hyperchromic shift?
7. Pyridine is more basic than aliphatic amines-Why?
8. Compare Aromaticity of pyrrole with Pyridine
9. Write any uses of Na/liq. NH_3.
10. Write the importance of NBS.

PART - B
Answer all the questions.   5 X 5 = 25

11. a) Write a note on Cahn – Ingold – Prelog rules**.** (or)
    b) Explain Asymmetric synthesis.
12. a) Discuss Geometrical isomerism of maleic and fumaric acids. (or)
    b) Explain conformational analysis of ethylene glycol.
13. a) Discuss the types of transitions in electronic spectroscopy. **(OR)**
    b) Define the terms : i) chromophore ii) auxochrome iii) bathochromic shift.
14. a) Explain molecular orbital structure of thiophene. (or)
    b) Write Fischer Indole Synthesis
15. a) Explain the preparation and applications of $LiAlH_4$. (or)
    b) Discuss the applications of $Pb(OAc)_4$.

PART - C
Answer ANY three questions.   3 X 10 = 30

16. Briefly explain optical activity of i)Allenes ii)Spiranes.
17. Discuss the conformational analysis of 1,2 and 1,3 disubstituted cycloalkanes.
18. Explain the factors affecting absorption spectra.
19. Explain the preparation and properties of Furan.
20. Discuss the applications of i) HIO_4 ii)OsO_4.

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VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN
(AUTONOMOUS)
DEPARTMENT OF CHEMISTRY
B.Sc. DEGREE EXAMINATION - V SEMESTER
MODEL QUESTION- INORGANIC CHEMISTRY - I

Time: 3 hrs   Max Marks: 75

PART - A
Answer all the questions.   **10 X 2=20**

1. What are the hard and soft acids and bases?
2. Write two examples of Lewis acids and bases.
3. Solution of alkali metal in ammonia acts as a good reducing agent. Why?
4. Write the autoionisation reactions for liq. N_2O_4 & SO_2.
5. What is meant by lanthanide contraction?
6. Write the uses of uranyl nitrate.
7. What is meant by chelate? Give an example.
8. Write the IUPAC Name of the following complexes
     (a) $[Co (NH_3)_5Cl] SO_4$ (b) $Na_3 [Cu(CN)_4]$
9. Write the hybridization and geometry of the complex.
10. Calculate the CFSE for d^4 high spin octahedral and tetrahedral complexes.

PART - B
Answer all the questions.   **5 X 5 = 25**

11. (a) Write a short note on Leveling effect.   **(OR)**
      (b) Which of the following is more acidic? Explain
                          $HClO_4, HClO_3, HClO_2, HClO$
12. (a) What are the characteristics of a solvent?   **(OR)**
      (b) Explain the reactions takes place in liq. SO_2.
13. (a) Give a brief account of Lanthanide contraction.   **(OR)**
      (b) Explain the preparation properties and uses of Uranyl nitrate, Thorium dioxide.
14. (a) Discuss the optical isomerism in square planar complexes.   **(OR)**
      (b) State and explain EAN rule.
15. (a) Explain the type of hybridization, geometry and magnetic properties for the following
          complex using VBT: $[Cu (NH_3)_4]^{2+}$ and $[Fe(CN)_6]^{3-}$.   **(OR)**
      (b) Explain crystal field splitting in octahedral complexes.

PART - C
Answer ANY three questions.   **3 X 10 = 30**

16. Explain the applications of HSAB concept.
17. Explain the solutions of alkali metal in liq. NH_3.
18. (i) Compare lanthanides and actinides (ii) Explain the isolation of lanthanides from monazite.
19. Explain Werner's theory. How it explain structure of co-ordination compounds?
20. (i) Discuss the postulates of VBT (ii) Explain CFSE & their uses?

14U5CHC07

Time: 3 hrs   **Max Marks: 75**

PART - A
Answer all the questions.   10 X 2=20

1. State Henry's law
2. Define Nernst distribution law
3. State Law of Mass action
4. When K_p becomes equal to K_x?
5. Define order of the reaction
6. What is half life period?
7. What is energy of activation?
8. Write the failures of CT
9. State Grothus-Draper law
10. A sample of gaseous HI was irradiated by light of wave length 253.7nm, when 307J of energy was found to decompose 1.30×10^{-3} mole of HI. Calculate the quantum yield for the dissociation of HI

PART - B
Answer all the questions.   5 X 5 = 25

11. (a) Write a note elevation of boiling point with an example
                                        (OR)
    (b) Explain Azeotropic distillation
12. (a) Write the Characteristics of Chemical Equilibrium
                                        (OR)
    (b) Write the relationship between K_p and K_c
13. (a) Derive the rate constant for the first order reaction
                                        (OR)
    (b) Explain isolation method.
14. (a) Write a short note on collision theory
                                        (OR)
    (b) Derive Lindemann theory
15. (a) Write a note non-radiative process   **(OR)**
    (b) Give an account of decomposition of HI

PART - C
Answer ANY three questions.   3 X 10 = 30

16. Explain the V-P compostion and V-P temperature curves
17. Explain thermodynamic derivation for the law of chemical equilibrium
18. Derive the rate constant of third order reaction with same and different initial concentration
19. Explain the ARRT theory
20. Explain the Jablonski diagram with respect to various process.

VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN
(AUTONOMOUS)
DEPARTMENT OF CHEMISTRY
B.Sc. DEGREE EXAMINATION - V SEMESTER
MODEL QUESTION- ANALYTICAL CHEMISTRY

Time: 3 hrs   **Max Marks: 75**

PART - A
Answer all the questions.

1. Write any two name of expolsive chemicals.
2. What are the first aids of accident involving acids.
3 What is co-precipitation?.
4. What are the priciples of precipitation.
5. What is regeneration of crucible.
6. What is distillation
7. Write the principe of adsorption chromatography
8. What is Rf value?
9. What are the types of paper chromatography?
10. Write any two applications of Gas chromatography?

PART - B
Answer all the questions.   5 X 5 = 25

11. (a) Explain waste disposal methods. **(OR)**
    (b) Discuss first aid procedure for accidents involving bromine, burns and cut by glass
12. (a) Write the application of solubility product principle in gravimetric analysis. **(OR)**
    (b)What are the conditions of precipitation?
13. (a) Discuss the choice of desiccant? **(OR)**
    (b) Explain detailed about fractional distillation
14. (a) Write the important solvent in chromatography techniques. **(OR)**
    (b) Write the principles of TLC.
15. (a) Explain paper electrophoresis. **(OR)**
    (b)Explain the experimental techniques of HPLC
.

PART - C
Answer ANY three questions.   3 X 10 = 30

16. (a) Write a note on storage and handling of flammable and toxic chemicals
    (b) Give a note on Threshold vapour concentration .
17. (a) Discuss the choice precipitant in gravimetric analysis.
    (b) Write briefly about organic precipitant-DMG, 8-OH quinolineand anthranilic acid.
18. (a) Write the technique involved in drying of solids.
    (b) What are the types of desiccant and relative effiicencies of desiccant?
19. Write in detail about TLC chromatography .
20. Explain the principle and experimental techniques of Gas chromatography

Time: 3 hrs   **Max Marks: 75**

PART - A
Answer all the questions.   10 X 2=20

1. Calculate the energy of the radiation of wavelength 20nm.
2. Write the selection rule for rotational spectra.
3. What is the condition for a molecule to be Raman active
4. What is Hook's law?
5. Define Stokes and anti stokes lines.
6. Write the selection rule for IR spectra.
7. What are the uses of TMS in NMR spectroscopy?
8. What is chemical shift?
9. Define nitrogen rule.
10. What is molecular ion peak?

PART - B
Answer all the questions.   5 X 5 = 25

11. (a) Explain the various types of regions in electromagnetic spectrum.
(OR)
    (b) Explain the rotational spectra of diatomic molecules (rigid rotor).
12. (a) Explain the types of fundamental vibrations.
(OR)
    (b) Explain the Modes of vibrations and their energies

13. (a) What are the difference between Rayleigh scattering and Raman scattering
(OR)
    (b) Explain the quantum theory of Raman effect.
14. (a) Explain the theory of NMR spectroscopy.
(OR)
    (b) Explain shielding and deshielding in NMR spectra.
15. (a) Explain the principles of mass spectroscopy.
(OR)
    (b) Explain isotopic peak in detail.

PART - C
Answer ANY three questions.   3 X 10 = 30

16. Explain the rotational spectra of diatomic molecules (non rigid rotor).
17. Explain the theory and Instrumentation of IR Spectrascopy
18. Compare IR and Raman spectra.
19. Explain the instrumentation of NMR Spectra and spin – spin coupling in NMR.
20. Explain the fragmentation of Alkanes and alkenes.

VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN
(AUTONOMOUS)
DEPARTMENT OF CHEMISTRY
B.Sc. DEGREE EXAMINATION - V SEMESTER
MODEL QUESTION- DYE CHEMISTRY

Time : Three hours   **Maximum : 75 Marks**

PART-A

10 x2=20

(Answer All Questions)

1.Define bathochromic effect.
2.Define auxochrome .
3.What is azo dyes with example?
4.Write the preparation of nitroso dyes with example.
5.Write the structure of metanil yellow.
6.Write any two uses of crystel Violet.
7.Write the preparation of sulphur dyes with example.
8.Draw the structure of anthranquinone dyes with example.
9.What is pigments ?
10. What is colouring agent?

PART-B   5X5=25
(Answer All Questions)
11.(a) How the wavelength of absorption changes to naked eye ?Explain . **(OR)**
  (b) Explain dependent Chromophores.
12. (a) Write the classification of azo groups and application .**(OR)**
   (b) Explain the Tautomerism in azo dyes.
13. (a) Write short notes on Eriochrome Black T **(OR)**
   (b) Illustrate Congo red with suitable examples.
14. (a) Give an brief account on methylene blue dye.**(OR)**
   (b) Give an brief account on Indigo dye.
15. (a) Write the requirements of organic pigments. **(OR)**
   (b)Explain anionic & cationic dyes with suitable examples.

PART - C   3X10=30
Answer any three of the following
16. Explain the quinonoid theory of dye Chemistry
17. Explain the mechanism of diazotization coupling with amines.
18. Write note on the structure ,properties and uses of malachite green .
19. Explain the Synthesis, reactions and applications of xanthene dyes .
20. Write the types & applications of Pigments.

Semester- VI	Total Hrs: 60
Paper Code: 14U6CHC08	Credit: 5

CORE PAPER - VIII
CHEMISTRY OF NATURAL PRODUCTS

OBJECTIVES

1.   To gain knowledge about optical and geometrical isomerism.

2.   Acquire the knowledge about heterocycles.

3.   To understand the reaction mechanism and reagents in organic synthesis.

Learning Outcome

To gain an insight into basic concept of optical isomerism .

To providing theoretical understanding of heterocyclic chemistry which includes various methods of synthesis and

application of those methods for the preparation of specific groups of heterocyclic systems.

To understand geometric isomerism and conformational isomerism

To acquire basic knowledge of mechanism of organic reactions.

To understand the reagents in organic synthesis

Unit – I (12) Fats, Oils and Wax
     Occurrence, properties - hydrogenation, drying of oils, hydrogenlolysis, Rancidity. Analysis of oils and fats – saponification, iodine number –occurrence Synthetic detergents –classification , Occurrence of wax,difference between wax and lipds, phosphoglycerides, phosphate esters, phosphate ester acids, cell membrane.

Unit – II (12) Terpenes
     Introduction – Isoprene rule, classification, isolation and general properties. General methods of Structural determination, structural elucidation and synthesis of monoterpenoids – Geraniol, menthol and α-Terpineol.
Alkaloids
     Introduction – Occurrence- General methods for determination of structure – classification – structural elucidation of coniine, piperine and nicotine.

Unit – III (12) Steroids, Hormones and Vitamins
        Steroids – definition – Cholesterol and Ergosterol (structure only). Steroidal Harmones – Androsterones, Testrosterone, Progestrone and Oestrone (structure only). Vitamin – Introduction, Classification, occurrence and deficiency of vitamins – Structures of water and fat soluble vitamins. Synthesis of Retinol, Thiamine and Ascorbic acid.

Unit – IV (12) Aminoacids, Peptides and Proteins

Classification and Synthesis of aminoacids –Zwitter ions – Isoelectric point – Peptides – N-terminal and C-terminal amino acid residues – determination of structure of peptides by end group analysis – Proteins – classification – structure of proteins – $1^°$, $2^°$, $3^°$ and quarternary structure, Denaturation of proteins, synthesis of a tripeptide.

Unit – V (12) Carbohydrates

Introduction – occurrence – classification – interconversion of glucose to fructose, fructose to glucose. D and L designation, Muta rotation. Chemical properties of glucose and fructose, evidence for open chain and cyclic structure of glucose and fructose, evidence for existence of α and β forms of glucose. Disaccharides – structural elucidation of sucrose & maltose. Polysaccharides – Starch and cellulose (structure only).

TEXT BOOKS
1. Finar I.L. Organic chemistry vol I & II- ELBS, Pearson Education Ltd., 2008.
2. O.P.Agarwal- Reactions and Reagents- Krishna prakashan media (p) Ltd., 1975
3. Bhal B.S and Arun Bhal- a text book of organic chemistry, S.Chand & company Ltd,1948.

REFERENCES

1. Kalsi.P.S Stereochemistry Conformation and Mechanism-, New Age International (p) Ltd, VIIth ,2008.
2. Nasipuri. D.Stereochemistry of organic compounds , second edition,Wiley Eastern Ltd., 1994.
3. K.S.Tewari, and N.K.Vishoni, Organic Chemistry, Vikas Publishing House.
4. Soni.P.L and Chawla.H.M. Text book of organic chemistry,26th revised edition, Sultan chand and sons, 1995.
5. V.K.Ahuluwalia, Rakesh kumar, Parashar.R.K, Organic reaction and mechanism,IVth edition, Narosa publishing house Pvt Ltd., 2011.
6. R.T.Morrison and Boyd, Organic Chemistry, VIth edition., PHI Learning Pvt Ltd., 2008.

Semester- VI	**Total Hrs: 60**
Paper Code: 14U6CHC09	**Credit: 5**

CORE PAPER - IX
INORGANIC CHEMISTRY - II

OBJECTIVES

1. To gain knowledge about the geometry of crystals and its significance.

2. Acquire the knowledge about the different oxidation states of halogens.

Learning Outcome

To gain an insight into characterization of inorganic compounds.

To acquire basic knowledge on electronegativity of different halogens and their resulting interhalogen compounds.

To enable the students to design and synthesis pharmaceutically valuable complexes.

UNIT – I:
Solid State Chemistry (12)

Crystalline and Amorphous solids – Differences – Symmetry in crystals – Basic crystal systems – Space lattice and unit cell – Bravais lattices – Miller indices – Types of crystals - Radius ratio rule and its applications – Structure of Sodium Chloride, Cesium Chloride, Zinc blende and Wurtzite. Defects in ionic crystals: Schottky, Frenkel, Metal excess and metal deficiency defects.

UNIT – II:
Inter Halogens and Pseudohalogens (12)

Definition - similarities and dissimilarities between halogen and pseudohalogen - preparation, properties, structure and uses of cyanogen and thiocyanogen - Naming of the interhalogens - types, preparation, properties, structure and uses of ICl, BrF_3, IF_5, and IF_7. Basic properties of iodine.

UNIT – III:
Electron Deficient Compounds (12)

Definition – Borides: structure, properties and uses – Boranes: Diborane – preparation, properties and uses - bonding in boranes – B_2H_6, B_4H_{10}, B_5H_9, B_5H_{11}, B_6H_{10} and $B_{10}H_{14}$ – Carboranes – Wade's rule – compounds of boron with nitrogen: preparation, properties and uses – borazine: preparation, properties and uses

UNIT – IV:
Coordination Chemistry – III (12)

Stability of complexes - Thermodynamic and kinetic stability - stepwise and overall stability constant - Factors affecting the stability of complexes.

Ligand substitution reactions in square planar complexes: The trans effect – Trans effect series – uses of trans effect – theories of trans effect – electrostatic polarization theory – π – bonding theory – mechanism of substitution reactions – factors affecting the rates of substitution reactions in square planar complexes.

UNIT-V:
Organometallic Compounds (12)

Organometallic compounds: Definition – Classification based on nature of C-M bond: Ionic, σ bonded and non classically bonded. Organometallic compounds of Lithium and Boron - preparation, properties, structure and uses. Olefin complexes - Zeise's salt - synthesis and structure Cyclopentadienyl complexes - Ferrocene- preparation, properties, bonding and uses.

TEXT BOOKS
1. Puri, Sharma, Kalia, Principles of Inorganic Chemistry 32nd Edition (2014), Milestone Publishers and Dustributor, New Delhi.
2. Wahid. U. Malik, G. D. Tuli, R. D. Madan, Selected topics in Inorganic Chemistry, S.Chand & company, New Delhi.
3. R. D. Madan, Satyaprakash's Modern Inorganic Chemistry, S. Chand Publishing, New Delhi.

REFERENCE BOOKS
1. Satya Prakash, G.D. Tuli, S.K. Basu and R.D. Madan, Advanced Inorganic Chemistry – Vol – I (2006), S. Chand Publishing, New Delhi.
2. Satya Prakash, G.D. Tuli, S.K. Basu and R.D. Madan, Advanced Inorganic Chemistry – Vol – II (2006), S. Chand Publishing, New Delhi.

VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN
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SYLLABUS

Semester- VI	**Total Hrs: 60**
Paper Code: 14U6CHC10	**Credit: 5**

CORE PAPER - X
PHYSICAL CHEMISTRY-II

OBJECTIVES

Encourage the students to study about the phases of compound, conductance of electrolytes and learn the theory of photo-physical processes.

Learning Outcome

Students will learn the formation of metal alloy systems.

Students can understand fundamental concepts of electrochemistry and method of determinations.

Students will be improved their knowledge towards dissociation of acids, bases and salts.

Students will learn the various types of cells and electrodes.

Students will gain knowledge about the radiative and non-radiative transitions in photochemistry.

UNIT- I
Chemical Equilibrium- II (12)
1.1   Equilibrium law for ideal gases – Effect of inert gas on reaction equilibrium.
1.2   Le Chatelier's principle – effect of change in concentration, pressure and temperature.
1.3   Derivation of van't Hoff reaction isotherm. de -Donder's treatment of chemical equilibria-concept of chemical affinity.
1.4 Temperature dependence of equilibrium constant- van't Hoff Isochore - Pressure dependence of equilibrium constant.

UNIT- II
 Phase Rule (12)
2.1 Statement, Explanation of terms involved, Derivation of phase rule.
2.2 One component system-water and sulphur systems-two component system - Solid – liquid equilibria – CST Lower and upper systems - simple eutectic system – Ag-Pb and KI-H_2O systems.
2.3 Compound formation with congruent melting points - $FeCl_3$. H_2O and Zn-Mg systems and compound formation with incongruent melting points –K-Na alloy system.
2.4   Freezing mixtures

UNIT- III
Electrochemistry –I (12)
3.1   Faraday's law, Electrical energy, Ohm's law, Electrolytic conductance -   specific conductance-

equivalent conductance- molar conductance- variation of molar conductance and conductance with dilution.

3.2 Transport number- Determination of transport number by Hittorf's method and moving boundary method. Effect of dielectric constants of solvents – Ionic mobilities – definition, determination. Kohlrausch's law – applications.

3.3 Conductometric titrations- introduction, types- strong acid vs strong base, weak acid vs strong base.

UNIT- IV
Electrochemistry-II (12)

4.1 Debye – Huckel Theory – Ionic atmosphere –dissociation of weak acids and bases – Ionic product of water — common ion effect.

4.2 pH and its determination – Hydrolysis of different types of salts – determination of degree of hydrolysis (Bredig's method).

4.3 Buffer solution – pH of Buffer solution – Henderson's equation.

4.4 Solubility products- relation between solubility product and molar solubility- Applications of solubility products.

UNIT- V
Electrochemistry-III (12)

5.1. Cell reaction and half cell reaction-cell representation- Electrochemical cells –Galvanic cell.

5.2. EMF - measurements , applications- Standard emf- emf series -   Reversible and Irreversible cells – types of reversible electrodes.

5.3. standard cell- single electrode potential –Types of electrode- Standard Hydrogen electrode and calomel electrode – Quinhydrone electrode and glass electrode – over voltage – LJP conjunction

5.4. Potentionmetric titration – principle, types of titrations and advantages.

TEXT BOOKS

1. Arun bahl, B.S.bahl and G.D.tuli, Essentials of physical chemistry, Revised edition 2010, S.Chand publication New delhi.
2. B.R.Puri, L.R.Sharma and M.S. Pathania, Principles of Physical Chemistry, Vishal Publishing Co, Jalandhar, 2008.
3. D.R.Crow,Principles and Applications of Electrochemistry, 4th Edition, CRC Taylor and Francis Group, 1994

REFERENCE BOOKS
1. Gurdeep Raj, Advanced Physical Chemistry, Krishna prakashan Media Pvt.Ltd, 35th edition,2009.
2. Peter Atkins and Julio de Paula, Physical Chemistry, 7th Edn, Oxford University Press, New York, 2002.
3. M.S.Yadhav, Electrochemistry, Anmol Publications Pvt Ltd, Revised Edition, 2001.

VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN
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DEPARTMENT OF CHEMISTRY
SYLLABUS

Semester-VI	**Total Hrs: 30**
Paper Code: 14U6CHE02	**Credit: 4**

ELECTIVE COURSE – II
MEDICINAL CHEMISTRY

OBJECTIVES

1. To help the student to understand the basic concepts in medicinal chemistry and to develop their critical thinking.

2. To learn the basics and applications of the chemical compounds as drugs in pharmaceutical industry.

3. To understand the importance of the constituents of blood and cancer chemotheraphy.

Learning Outcome

Students will learn the basic principles of chemistry involved in life sciences.

Students will have basic understanding on cancer chemotherapy and haemetology.

Students will be able to incorporate the causes of various diseases and proper usage of medicines.

Students will be able to know the different types of drugs being used in drug industry.

UNIT – I (6)
Study of Drugs

Definition of the terms – Drug, Pharmacophore, Pharmacodynamics, Pharmacopoeia, pharmacology, pharmacokinetics, Bacteria, Virus, Fungus, Actinomycetes, Metabolites, Metabolism of drug, Antimetabolites, L_{D50}, E_{D50}. Classification of drugs, Assay of drugs – Specific methods.

UNIT – II (6)
Antibiotics

Antibiotics – definition – classification as broad and narrow spectrum antibiotics -.Structure , properties, mode of action and uses of penicillin, chloramphenicol, streptomycin, tetracycline, novobiocin, puromycin .

UNIT – III (6)
Sulphonamides

Sulphonamides – preparation, properties and uses of sulphanilamides – mechanism and action of sulpha drugs – preparation, properties and uses of sulphadiazine, sulphapyridine, prontosil and sulphathiazole

UNIT – IV (6)
Blood and Haematological Agents

Blood – composition of blood – pH of blood –blood Serum – blood grouping and matching – physiological function of plasma protein – role of blood as oxygen carrier with haemoglobin– cyctochrome. Blood pressure, hypertension, clotting of blood and haemotological agents.

UNIT – V (6)
Cancer Chemotherapy

Types of neoplasms – sarcoma, carcinoma, carcinosarcoma, teratoma, leukemia and polycythemia. Causes of cancer – virus and chemicals. Treatment of cancer – surgery, radiation therapy and medical therapy. Cytotoxic anticancer drugs – alkylating agents –Bis-chloroethylamines, Cyclophosphamide, Mechlorethamine, Ethyleneimines, Alkyl Sulfonates, Nitrosoureas – Miscellaneous of alkylating agents – Mode of action of Alkylating agents.

TEXT BOOKS
1. S.Lakshmi, Pharmaceutical Chemistry, S.Chand & Sons ,New Delhi,2004.
2. V.K.Ahluwalia and Madhu Chopra, Medicinal Chemistry ,Ane Books,New Delhi,Reprint 2009.

REFERENCE BOOKS
1. Graham Patrick, Medicinal Chemistry ,VIVA Books Private Ltd , New Delhi ,2002 .
2. Rama Rao Nadendla , Principles of Organic Medicinal Chemistry New Age International Private Ltd Publishers, New Delhi Reprint 2007.
3. P.Parimoo, A Text Book of Medicinal Chemistry,CBS Publishers,New Delhi,2006.

VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN
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DEPARTMENT OF CHEMISTRY
SYLLABUS

Semester-VI	**Total Hrs: 30**
Paper Code:14U6CHS03	**Credit: 3**

SKILL BASED ELECTIVE COURSE – III
POLYMER CHEMISTRY

OBJECTIVES

To impart the students the knowledge of polymer materials, their formation mechanisms,

properties and uses.

Learning Outcome

Students will be able to gain knowledge about the properties and classification of polymers.

Students will be able to estimate the number- and weight-average molecular masses of polymers given the degree of polymerisation and mass fraction of chains present.

Students will enhance their knowledge towards the commercially important polymers, their preparation and applications.

UNIT-I (6)
1.1   Classification of polymer - Natural, Synthetic, Organic and Inorganic Polymers - Nomenclature of polymers- Degree of polymerization – Funtionality - Tacticity of Polymers (Isotactic, Syndiotactic and Atactic) - Physical properties of polymers - Elasticity, Tensile strength, Chemical Resistant, Melting , Boiling point and Glass Transition Temprrature.
1.2   General methods of preparation of polymer-Emulsion,Solution,Suspension and Precipitation Polymerization.

UNIT –II (6)
2.1   Mechanism of polymerization. Cationic- anionic-free radical and Coordination polymerization.
2.2   Types of Polymerization – Condensation and Addition Polymerization
2.3   Individual Polymers-Polyacrylates, Polystyrene, Polyethylene, Polyvinylchoride, Polyester, Polyamides- (Nylon-6, Nylon 66), Kevlar-Preparation and Uses.

UNIT – III (6)
3.1 Molecular weight and its determination: concept of Molecular weight-Number average Molecular weight-Weight average molecular weight. Methods of determining molecular weight by Osmometry, Viscometry and sedimentation.

UNIT –IV (6)

4.1 Polymer degradation-Definition- Types of degradation- Thermal degradation-Mechanical degradation, Hydrolytic degradation, Photodegradation and Biodegradation.

4.2 Tyes of Rubber - Natural Rubber and synthetic process – Vulcanization.

4.3 Compounding Materials of Polymers-Plastics-Fillers-Plasticizers-Colorants-Antioxidants-Stabilizers and Lubricants. Thermoplastic and Thermosetting Plastic – Definition,   examples and Differences

UNIT-V (6)

5.1 Industrially important polymers-Fibre Reinforced Plastic (FRP)-Foamed Plastics-Electrically Conducting Polymers, polymers in biological application.

TEXT BOOKS:

1. V,R.Gowarikar.,N.V.Viswanathan: Polymer Science-Wiley Eastem limited,New Delhi.1986.
2. Textbook of Polymer Science –FW Billmeyer,Wiley-1984.
3. Dr.M.S.Bhatnagar, A Text Book Polymers, S.Chand & Company Ltd, Ram Nagar,New Delhi. Volume-II-2004

REFERENCES :

1. P.Bahadur, N.V.Sastry : Principles of Polymer Science, Narosa Publishing House, New Delhi, Second Edition ,
2. R.B.Seymour ,Introduction to Polymer Chemistry,Craw Hill,New York 1971.
3. S.S.Dara,A Text Book in Engineering Chemistry, S.Chand & Company Ltd,New Delhi. Third Edition,1992.
4. M.P.Stevens, Polymer Chemistry an introduction, Oxford-1990.

Semester-VI	Total Hrs: 30
Paper Code: 14U6CHS04	Credit: 3

SKILL BASED ELECTIVE COURSE – IV
APPLIED CHEMISTRY

UNIT –I:
Water Quality Measurements (6)

Quality of Water-Parameters-pH,Alkalinity,Hardness,COD, BOD,CDS, TS, TDS, DO, Organic and Inorganic compounds,Impurities in water - hardness of water - Estimation of hardness by EDTA method ,Water quality standard-ISI,EPA,WHO

UNIT II :
Water Treatments (6)

Methods of Treatment of water for domestic purposes: Sedimentation, Coagulation, Filtration, Sterilization, Break point chlorination ,Reverse Osmosis, Sand filtering - disadvantages of hard water, Softening methods - lime soda process, zeolite process and ion exchange method - removal of suspended impurities -removal of micro organisms.

UNIT –III:
Fuels (6)

Energy sources: Introduction of Renewable sources. Non-renewable, classification of fuels, solid, liquid and gaseous. Calorific value of fuels and its determination. Solid fuels: Coal: types, properties and uses of lignite, coal. Coking and non-coking coal. Liquid fuels: Refining of crude petroleum and uses of fractions. Cracking: thermal and catalytic. Octane number. Gaseous fuels: Natural gas and gobar gas: production, composition and uses.

UNIT IV:
Fertilisers, Pesticidies and Insecticides (6)

Discussion on ammonium nitrate, urea, superphosphate, triple superphosphate, diammonium phosphate, potassium nitrate, uses of mixed fertilizers, micronutrients and their role. Classification of pesticides with examples, Advantages and disadvantages of pesticides. Stomach poisons, contact insecticides, fumigants, manufacture and uses of insecticides.

UNIT V: (6)

Paints – Requirements of good paint, primary constituents of paints and their functions, dispersion medium(solvent), thinner, binder, pigments, oil-based paints, manufacture of paints and special paints. Varnishes – Constituents, characteristics of good varnish, types and uses, basic concept of lacquers and enamels

TEXT BOOKS:

1. Biswas A.K., Frontiers in Applied Chemistry, Narosa publishing house., (1989)
2. J. C. Kuriacose and J. Rajaram, Engineering Chemistry , Tata McGraw-Hill Co. New-Delhi.
3. Sharma. B.K., Industrial chemistry including chemical engineering (16th), Meerut, Krishnaprakasam media. (2011).

REFERENCES:

1. B.S Bahl and Arun Bahl, Text Book of Organic Chemistry, S.Chand. & Company Ltd., New Delhi, Revised Edition, 2012.
2. S. S. Dara, A text book of Engineering Chemistry ., S. Chand & Co. New Delhi.
3. M. M. Uppal & S.C. Bhatia .,Engineering Chemistry ., Khanna Publishers, New Delhi.
4. C.P. Murthy, C. V. Agarwal and A. Naidu .,Chemistry of Engineering Materials ., B. S. Publication, Hyderabad

Semester- V & VI	**Total Hrs: 3**
Paper Code:14U6CHCP03	**Credit: 4**

CORE PRACTICAL- III
PHYSICAL CHEMISTRY PRACTICAL

OBJECTIVES

To verify the some important principles in physical chemistry and to determine various

physical properties using simple instruments like conductivity meter, potentiometer, etc.

Learning Outcome

To develop skills in doing experiments in kinetics, Potentiometry and phase rule.

To make students capable of understanding and verifying principles of physical chemistry practically.

Students will gain an understanding of how to keep records of instruments, parameters, and experimental

observations.

A) Kinetics

1. Rate constant determination for first order reaction-Hydrolysis of an ester in acidic medium.(Ethyl acetate or Methyl acetate)

2. Rate constant determination for second order reaction-Reaction between Potassium persulphate and Potassium iodide.

B) Conductivity

1. Determination of cell constant

2. Determination of dissociation constant for weak acid.(Acetic acid)

3. Determination of Equivalent conductance at infinite dilution for strong electrolyte.(Potassium chloride)

4. Conductometric titration-Strong acid vs Strong base-

5. Weak acid vs Strong base.

C) Potentiometry

Potentiometric titration- Strong acid vs Strong base- Weak acid vs Strong base.

D) Heterogenous Equilibrium

1. Binary system-naphthalene/biphenyl

2. Phenol/water system-determination of CST and study of effect of impurity (NaCl) on CST.

3. Determination of transition temperature for hydrated salts-sodium thiosulphate, sodium acetate, strontium chloride, manganous chloride.

4. Determination of K_f of a solvent by Rast method

TEXT BOOKS AND REFERENCE BOOKS

1. Basic Principle of Practical chemistry – V.Venkateswaran, R.Veeraswamy and A.R. Kulandaivelu,S.Chand and Sons ,NewDelhi,2004.

2. Experimental Physical chemistry V.D.Athawale,Parulmathur,Newage international publishers,2001.

**VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN
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DEPARTMENT OF CHEMISTRY
SYLLABUS**

Semester- V & VI	**Total Hrs: 10**
Paper Code:14U6CHCP04	**Credit: 6**

CORE PRACTICAL- IV
ORGANIC ANALYSIS, PREPARATIONS AND GRAVIMETRIC ESTIMATIONS
OBJECTIVES

1. The students will get training in the quantitative analysis of metal ions using gravimetric method.

2. The students will get training for systematic qualitative analysis and preparation of simple organic compounds.

Learning Outcome

Students will learn to predict the outcome of organic reactions using a basic understanding of the general reactivity of functional groups and mechanism.

Enable the students to work effectively as a member of a team and tocCommunicate productively with lab mates, teaching assistant and instructor.

Students will learn to maintain a detailed scientific notebook.

(I) Organic Qualitative analysis:
Analysis of Organic Compounds

Characterization of organic compounds by their functional group and confirmation by preparation of derivatives. The following functional groups may be studies: Carboxylic Acids (mono and di), Phenols, Aromatic Esters, Aldehydes, Ketones, Monosaccharides, Amides, Diamides, Aromatic primary amines and Nitro compounds.

(II) Organic Preparations:
Preparations involve the following reactions:

1. Oxidation – Preparation of Benzoic acid from Benzaldehyde

2. Hydrolysis – Preparation of Methyl salicylate from Salicylic acid

3. Nitration- Preparation of *p* - Nitroacetanilide from Acetanilide

4. Bromination – Preparation of *p* - Bromoacetanilide from Acetanilide

5. Bromination – Preparation of *sym* - Tribromophenol from Phenol

6. Benzoylation – Preparation of Benzanilide from aniline

(III) Gravimetric Estimations
(1) Estimation of Nickel as Nickel DMG Complex
(2) Estimation Barium as Barium Chromate
(3) Estimation of Lead as Lead Chromate

NOTE:
>   Practical procedures will be supplied by the department.

TEXT BOOKS AND REFERENCE BOOKS
1. Dr. N.S Gnanapragasam, Organic chemistry Lab manual.
2. V. Venkateswaran, R. Veeraswamy and A.R. Kulandaivelu, Basic Principle of Practical chemistry, S. Chand and Sons, New Delhi, 2004.
3. Raj .K. Bansal, Laboratory Manual of Organic chemistry, 3rd Edition, New Age Internal Publication
4. B.S. Furniss, A.J.Hannaford, P.W.D Smith and A.R. Tatchell, Vogel's Practical Organic chemistry, 5th Edition. ELBS (1989)

VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN
(AUTONOMOUS)
DEPARTMENT OF CHEMISTRY
B.Sc. DEGREE EXAMINATION - VI SEMESTER
MODEL QUESTION- CHEMISTRY OF NATURAL PRODUCTS

Time: 3 hrs   **Max Marks: 75**

PART - A
Answer all the questions.   **10 X 2=20**

1. Define the term iodine number.
2. What is meant by rancidity?
3. Define isoprene rule.
4. Draw the structure of nicotine.
5. Write the deficiency diseases of Retinol, Thiamine & Ascorbic acid.
6. Draw the structure of Cholesterol.
7. What is denaturation of protein?
8. What are peptides?
9. Draw the Haworth structure for D-Glucose & L-Fructose.
10. Write the structure of starch.

PART - B
Answer all the questions.   **5 X 5 = 25**

11. (a) Write the differences between wax and lipids. **(OR)**
    (b) What are the methods to analyse oils and fats.
12. (a) Write a note on the classification of terpenoids. **(OR)**
    (b) Explain the structural elucidation of Geraniol.
13. (a) Write the structure of Androsterone, Testosterone, Progesterone and Oestrone. **(OR)**
    (b) Explain the vision process takes place in Retinol.
14. (a) Define Zwitter ion and Isoelectric point. **(OR)**
    (b) Write a notes on N-terminal and C-terminal aminoacids
15. (a) How do you interconvert glucose into fructose? **(OR)**
    (b) Discuss the chemical properties of D - Glucose.

PART - C
Answer ANY three questions.   **3 X 10 = 30**

16. Explain the classification of synthetic detergents.
17. Explain the structural elucidation of α - Terpineol.
18. How do you synthesize retinol and ascorbic acid?
19. Explain the structure of protein
20. Discuss in detail about cyclic structure of fructose.

VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN
(AUTONOMOUS)
DEPARTMENT OF CHEMISTRY
B.Sc. DEGREE EXAMINATION - VI SEMESTER
MODEL QUESTION- INORGANIC CHEMISTRY - II

Time: 3 hrs   **Max Marks: 75**

PART - A
Answer all the questions.   **10 X 2=20**

1. Define the term space lattice and unit cell.
2. How many Cl^- ions are surrounded by Na^+ ion in NaCl?
3. $(CN)_2$ is a pseudohalogen. Why?
4. Draw the structure of IF_5 and IF_7.
5. How many 2c-2e and 3c-2e bonds in diborane?
6. Define Wade's rule.
7. What is meant by trans effect?
8. How do you prepare cis - diamminedichloroplatium (II)ion?
9. What is meant by organometallic compound? Give an example.
10. Draw the structure of zeise's salt.

PART - B
Answer all the questions.   **5 X 5 = 25**

11. (a) Write a note on the applications of radius ratio rule. **(OR)**
    (b) Write a brief note on metal excess and metal deficiency defects.
12. (a) What are the similarities and differences between halogens and pseudohalogens. **(OR)**
    (b) Explain the preparation, properties and uses of IF_5 and BrF_3.
13. (a) Why borazine is said to be inorganic benzene? **(OR)**
    (b) Explain the preparation properties and uses of boron nitride.
14. (a) Discuss the uses of trans effect. **(OR)**
    (b) Write a note on trans effect series.
15. (a) Explain the preparation and structure of Zeise's salt. **(OR)**
    (b) What is meant by non – classically bonded organometallics? Explain using examples.

PART - C
Answer ANY three questions.   **3 X 10 = 30**

16. Explain the structure of NaCl crystal.
17. Explain the preparation, properties and structure of cyanogen.
18. Describe the structure of diborane.
19. Explain electrostatic polarization and pi-bonding theories of trans effect.
20. Discuss the properties and bonding in ferrocene.

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DEPARTMENT OF CHEMISTRY
B.Sc. DEGREE EXAMINATION - VI SEMESTER
MODEL QUESTION- PHYSICAL CHEMISTRY - II

Time: 3 hrs **Max Marks: 75**

PART - A
Answer all the questions. **10 X 2=20**

1. Write Le Chatelier's principle
2. Define chemical affinity.
3. Define the term degrees of freedom.
4. What is meant by eutectic system.
5. Define equivalent conductance.
6. Define Ionic mobility.
7. What is buffer solution?
8. What is Ionic product of water?
9. Write a short notes on Cell reaction.
10. State EMF series.

PART - B
Answer all the questions. **5 X 5 = 25**

11. (a) Explain Effect of change in concentration using Le Chatelier's principle.

(OR)

(b) Derive Vant-Hoff reaction isotherm.

12. (a) Derive phase rule equation.

(OR)

(b) Explain the phase diagram of water system.

13. (a) Explain the terms i) Effect of Dielectric constant of solvents ii) Molar conducatance

(OR)

(b) Explain conductometric titration of Weak acid Vs Strong base.

14. (a) Determination of degrees of hydrolysis by Bredig's method.

(OR)

(b) Calculate the pH before and after addition of 0.01mole of NaOH to 1litre of a buffer solution that is 0.1M in sodium acetate. The dissociation constant of acetic acid is 1.75×10^{-5}.

15. (a) Explain the types of reversible electrodes.

(OR)

(b) Explain briefly on glass electrode.

PART - C
Answer ANY three questions. **3 X 10 = 30**

16. Explain briefly De-Donder's treatment of chemical equilibrium.
17. Explain the phase diagram of ferric chloride system.
18. Determine transport number by Hittorf's and moving boundary method.
19. Derive Henderson equation for weak acid and weak base.
20. Explain potentiometric titrations.

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DEPARTMENT OF CHEMISTRY
B.Sc. DEGREE EXAMINATION - VI SEMESTER
MODEL QUESTION- MEDICINAL CHEMISTRY

Time : Three hours   **Max Marks: 75**

SECTION A – (10 x 2 = 20 marks)
Answer ALL Questions

1. Define the term pharmacokinetics.
2. What do you meant by pharmacophore.
3. Write the preparation of penicillin.
4. Write any two uses of chloramphenicol.
5. Mention the chemical properties of sulphadiazine.
6. Write the preparation of sulphapyridine.
7. Define the term blood pressure.
8. Write the composition of blood.
9. Write the causes of cancer.
10. Write down the ranges of normal, hypo and hyper pressure.

SECTION B – (5 x 5 = 25 marks)
Answer ALL Questions

11. (a) Explain drug metabolism with suitable example.

(OR)

  (b) Write short note on pharmacology and pharmacodynamics.

12. (a) Write the preparation & properties of tetracycline.

(OR)

  (b) Write the preparation & properties of streptomycin.

13. (a) Write short note on prontosil .

(OR)

  (b) Write short note on sulphathiazole

14. (a) Write short note on blood pressure.

(OR)

  (b) Explain the physiological functions of plasma protein.

15. (a)Write short notes on treatment of cancer .

(OR)

(b)Explain the Cytotoxic anticancer drugs .

SECTION B – (3 x 10 = 30 marks)
Answer any THREE Questions

16. Explain the assay of drugs.
17. Explain the action of penicillin.
18. Write the preparation, properties and uses of sulphanilamides.
19. Briefly explain the role of blood as oxygen carrier.
20. Explain the mode of action of alkylating agents.

VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN
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DEPARTMENT OF CHEMISTRY
B.Sc. DEGREE EXAMINATION – IV SEMESTER
MODEL QUESTION - SKILL BASED ELECTIVE COURSE-II
POLYMER CHEMISTRY

Time: 3 hrs   **Max Marks: 75**

PART - A
Answer all the questions.   10 X 2=20

1. Define polymers?
2. What do you mean by Degree of Polymerization?
3. What do you mean by Ionic Polymerisation?
4. How can you distinguish addition and condensation Polymerisation?
5. What is number average molecular weight polymer?
6. Define Polymer drgradation.
7. What do you mean by Vulcanization?
8. Define thermosetting plastic.Give examples.
9. Give any three importance of foamed plastic?
10. Mention any four uses of FRP?

PART - B
Answer all the questions.   5 X 5 = 25

11. (a) Define Polymers and its physical properties.   **(OR)**
    (b) Write note on Emulsion Polymerization.
12. (a) Sketch the mechanism of Addition Polymerization.
            (OR)
    (b) Write any two example by condensation Polymerization.
13. (a) Write short note on Osmometry methods.
            (OR)
   (b) Give an accont on viscometry method.
14. (a) Give an account on one type of Polymer degradation.
            (OR)
   (b) Write note on the types of Rubber?
15. (a) Write note on Electrically Conducting Polymers?
            (OR)
   (b) Write the importance of FRP?

PART - C
Answer ANY three questions.   3 X 10 = 30

16. Explain the Following polymerization
        a)Suspension Polymerization   b)Precipitation Polymarization
17. Explain the mechanismof Polymerization?
18. How will determine molecular weight by sedimentatiom method?
19. Give a detail on the types of degradation.
20. Describe the Industrially Application Polymrs.

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VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN
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DEPARTMENT OF CHEMISTRY
B.Sc. DEGREE EXAMINATION - V SEMESTER
MODEL QUESTION- APPLIED CHEMISTRY

Time: 3 hrs   **Max Marks: 75**

PART - A
Answer all the questions.   .   **10 X 2=20**

1. Define COD.
2. Define BOD.
3. What is Coagulaton?
4. Define Reverse Osmosis?
5. Define Octane number.
6. What is Cracking?
7. Define micronutrients.
8. Write disadvantages of pesticides.
9. Define varnish.
10. Write the constitutents of paint

PART - B
Answer all the questions.   **5 X 5 = 25**

11. (a) Explain the estimation of hardness by EDTA method.   **(OR)**
   (b) Explain organic and inorganic impurities present in water.
12. (a) Write the disadvantages of hard water.

(OR)

   (b) Explain (i) Lime soda process (b) Zeolite process
13. (a) Explain Calorific value of fuels and its determination.

(OR)

   (b) Explain Refining of crude petroleum and uses of fractions.
14. (a) Write the manufacture and uses of Insecticides.

(OR)

   (b) Describe in detail the classification of Pesticides.
15. (a) What are the requirements of a good paint?

(OR)

   (b) Explain varnish and its types.

PART - C
Answer ANY three questions.   **3 X 10 = 30**

16. Discuss the parameters to check quality of water.
17. Describe in detail the following methods (a) Sedimentation (b) Sterilization (c) Breakpoint chlorination (d) Filteration
18. Explain Natural gas and gobar gas including their production, composition and uses.
19. Write in detail for the following (a) ammonium nitrate (b) superphosphate (c) triple superphosphate (d) diammonium phosphate (e) potassium nitrate
20. Explain the manufacture of paints.