VIVEKANANDHA

COLLEGE OF ARTS AND SCIENCES FOR WOMEN [AUTONOMOUS]

An ISO 9001:2008 Certified Institution,
Affiliated to Periyar University, Salem,
(Approved by AICTE and Re-Accredited with 'A' Grade by NAAC,
Recognized Under 2(f) and 12(b) of UGC Act, 1956).
Elayampalayam, Tiruchengode - 637 205, Namakkal Dt., Tamilnadu, INDIA.

DEPARTMENT OF CHEMISTRY

BACHELOR OF SCIENCE (B.Sc.)

VICAS

CHEMISTRY

B.Sc., CHEMISTRY

REGULATIONS AND SYLLABUS

[FOR CANDIDATES ADMITTED FROM 2018-19 ONWARDS UNDER AUTONOMOUS – CHOICE BASED CREDIT SYSTEM (CBCS) & OUTCOME BASED EDUCATION (OBE) PATTERN]

SPONSORED BY

ANGAMMAL EDUCATIONAL TRUST

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About the College

Vivekanandha College of Arts and Sciences for Women (Autonomous) was established and hailed into Women's Educational Service in the Year 1995. Angammal Educational Trust Chaired by the great Educationalist 'Vidhya Rathna' Prof. Dr. M. KARUNANITHI, B.Pharm., M.S., Ph.D., D.Litt., sponsors this college and other institutions under the name of the great Saint Vivekanandha. Our institutions are situated on either side of Tiruchengode-Namakkal Main Road at Elayampalayam, 6 kms away from Tiruchengode. This is biggest women's college in India with more than 7500 girl students and more than 18 departments. The strength of the college was just 65 at the time of its establishment. With the dedication, work, sacrifice and long vision of the chairman, this institution has grown into a Himalaya stage. As a result of which UGC, New Delhi, awarded 2f and 12b, extended Autonomous status for second cycle. The National Assessment and Accreditation Council reaccredited with grade 'A' for its successful performance.

As an Autonomous Institution, academic professionals of the college framed Curriculum and Syllabi in consultation with all its stakeholders to cater the needs of the young women to fulfill the women empowerment and present Industrial needs to the local benefits. The students are empowering with confidence and required skills to face the society.

Quality Policy

To provide professional training by establishing a high level center of learning that provides quality education at par with the international standards and Provide excellence education with well equipped infrastructure to all the rural women.

Our Vision

To be an academic institution exclusively for women, in dynamic equilibrium with the social and economic environment, strive continuously for excellence in education, research and technological service to the nation.

Our Mission

The mission of our institution is to discover, teach and apply knowledge for the intellectual, cultural, ethical, social and economic growth of women students.

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6	English I - Foundation English I	
7	Core I – General Chemistry – I	
9	Allied I – Physics - I	
10	Allied Practical I – Physics	
11	Value Education I – Yoga	
1	COURSE PATTERN WITH PAPERS	
2	Language II - Tamil II	
3	Malayalam II	
4	Hindi II	
5	French II	
6	English II - Foundation English II	
7	Core II - General Chemistry – II	
8	Core Practical I – Volumetric Estimations & Inorganic Preparations	
9	Allied II - Physics	
10	Allied Practical II - Physics	
11	Value Education II – Environmental Studies	

S. No.	TOPICS	P. No.
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1	COURSE PATTERN WITH PAPERS	
2	Language III - Tamil III	
3	Malayalam III	
4	Hindi III	
5	French III	
6	English III - Foundation English III	
7	Core III – General Chemistry - III	
8	Core Practical II – Inorganic Qualitative Analysis	
9	Allied III - Maths	
10	Allied Practical I- Maths	
11	NMEC I – Essentials of Electricity	
SYLLABUS FOR YEAR II (Semester IV)		
1	COURSE PATTERN WITH PAPERS	
2	Language IV- Tamil IV	
3	Malayalam IV	
4	Hindi IV	
5	French IV	
6	English IV - Foundation English IV	
7	Core IV - General Chemistry - III	
8	Core Practical II – Inorganic Qualitative Analysis	
9	Allied IV – Maths	
10	Allied Practical I- Maths	
11	NMEC II – Physics in Everyday Life	
SYLLABUS FOR YEAR III (Semester V)		
1	COURSE PATTERN WITH PAPERS	
2	Core V- Organic Chemistry - I	
3	Core VI - Inorganic Chemistry - I	
4	Core VII – Physical Chemistry - I	
5	EC I- Analytical Chemistry	
6	SBEC I- Spectroscopy	
7	Core Practical III – Physical Chemistry	
8	Core Practical IV – Organic Analysis & Preparations , Gravimetric Estimations	
SYLLABUS FOR YEAR III (Semester VI)		
1	COURSE PATTERN WITH PAPERS	
2	Core VIII- Organic Chemistry - II	
3	Core IX - Inorganic Chemistry – II	
4	Core X - Physical Chemistry – II	
5	EC II- - Medicinal Chemistry	
6	SBEC II- Polymer Chemistry	
7	Core Practical III – Physical Chemistry	
8	Core Practical IV – Organic Analysis & Preparations , Gravimetric Estimations	

REGULATIONS

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. To have academic flexibility we have chosen and implemented Choice Based Credit System (CBCS) in our syllabus. To enhance the quality of students from 2018-2019, we have implemented Outcome Based Education (OBE) education system for I UG students. The OBE pattern will be extended for the II UG and III UG students forth coming years.

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

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 themselves prepared 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

A candidate who has passed Higher secondary examination of Tamil nadu Higher secondary board or an examination of some other board accepted by the syndicate as equivalent there to with Chemistry and Physics and any one of the subjects namely Maths, Botany, Zoology or Biology, Home science shall be eligible for admission into B.Sc., course in chemistry.

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 ASSESSMENT

Assessment of the students would be made through Continuous Internal Assessment (CIA) and External Assessment (EA) for passing each subject both theory and practical papers.

A candidate would be permitted to appear for the External Examination only on earning 75 % of attendance and only when her conduct has been satisfactory. It shall be open to grant exemption to a candidate for valid reasons subject to conditions prescribed.

A. CONTINUOUS INTERNAL ASSESSMENT (CIA)

The performance of the students will be assessed continuously by the teacher concern and the Internal Assessment Marks will be as follows:

Distribution Of Continuous Assesment Marks (Theory-25/Practical-40)

Activity (Theory)	**Period (WD)**	**Marks (25)**	**Activity (Practicals)**	**Marks (40)**
Attendance	90	5	Attendance	5
CA Test I	30 to 35	2.5	Review I	5
CA Test II	60 to 65	2.5	Review II	5
Model	After 90	10	Model Practical Examination	10
Assignment	15 to 20	1	Observation note	10
Poster	30 to 35	1	Results in lab/Work	5
PowerPoint	45 to 50	1		
Skit	60 to 65	1		
Group discussion	65 to 70	1		
Total		**25**		**40**

Distribution of attendance mark

S. No.	**Percentage**	**Marks**	
		Theory	**Practical**
1	76-80	1	2
2	81-85	2	4
3	86-90	3	6
4	91-95	4	8
5	96-100	5	10

B. EXTERNAL ASSESSMENT (EA)

The performance of the students would be assessed by examination at the end of each semester with a written test for theory for three hours and practical examination at the end of even semesters for six hours. Question papers would be set by the selected external examiners in the prescribed format and valuated by the external examiners with the help of the teacher concern.

The pattern of assessment is as follows:

Distribution Of Final Assesment Marks (75/60)

Section	Activity	Marks (75)	Activity	Marks (60)
A	One mark (20)	20	Record work	5
B	Five marks (Either or)	25	Viva Voce	5
C	Ten marks (3/5)	30	Spotter	20
			Major (Performance)	5
			Major (Result)	5
			Major (Writeup)	10
			Minor (Performance)	2
			Minor (Result)	3
			Minor (Writeup)	5
Total		**75**	**Total**	**60**

VII. PASSING MINIMUM

INTERNAL

There is no passing minimum for CIA

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 %).

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 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 2017-18.

XII. COURSE PATTERN

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)
SYLLABUS FRAME WORK

Subjects	Inst. Hour/Week	Credit	Exam Hours	Internal	External	Total Marks	Subjects	Inst. Hour/Week	Credit	Exam Hours	Internal	External	Total Marks
YEAR I													
Semester I							**Semester II**						
Language I & 18U1LT01	4	3	3	25	75	100	Language II & 18U2LT02	4	3	3	25	75	100
English I & 18U1LE01B	4	3	3	25	75	100	English II & 18U2LE02B	4	3	3	25	75	100
Core I & 18U1CHC01	5	5	3	25	75	100	Core II & 18U2CHC02	4	5	3	25	75	100
Core I Practical & 18U2CHCP01	4	0	3	40	60	100	Core I Practical & 18U2CHCP01	4	4	3	40	60	100
Allied I & 18U1PHA01	5	5	3	25	75	100	Allied II & 18U2PHA02	4	5	3	25	75	100
Allied I Practical & 18U2PHAP01	4	0	3	40	60	100	Allied I Practical & 18U2PHAP01	4	4	3	40	60	100
Valued added course & 18U1VE01	2	2	3	25	75	100	Valued added course &18U2ES01	4	4	3	25	75	100
Library	1	0	0	0	0	0	Library	1	0	0	0	0	0
Sports	1	0	0	0	0	0	Sports	1	0	0	0	0	0
Total	**30**	**18**	**21**	**205**	**495**	**700**	**Total**	**30**	**28**	**21**	**205**	**495**	**700**
I YEAR TOTAL									**46**	**42**	**410**	**990**	**1400**
YEAR II													
Semester III							**Semester IV**						
Language III & 18U3LT03	4	3	3	25	75	100	Language IV & 18U4LT04	4	3	3	25	75	100
English III & 18U3LE03B	4	3	3	25	75	100	English IV & 18U4LE04B	4	3	3	25	75	100
Core III & 18U3CHC03	5	5	3	25	75	100	Core IV & 18U4CHC04	5	5	3	25	75	100
Core II Practical & 18U4CHCP02	4	0	3	40	60	100	Core II Practical & 18U4CHCP02	4	4	3	40	60	100
Allied III & 18U3MAA01	5	5	3	25	75	100	Allied IV & 18U4MAA02	5	5	3	25	75	100
Allied II Practical & 18U4MAAP01	4	0	3	40	60	100	Allied II Practical & 18U4MAAP01	4	4	3	40	60	100
NMEC I & 18U3PHN01	2	2	3	25	75	100	NMEC II & 18U4PHN02	2	2	3	25	75	100
Library	1	0	0	0	0	0	Library	1	0	0	0	0	0
Sports	1	0	0	0	0	0	Sports	1	0	0	0	0	0
Total	**30**	**18**	**21**	**205**	**495**	**700**	**Total**	**30**	**26**	**21**	**205**	**495**	**700**
II YEAR TOTAL									**90**	**84**	**820**	**1980**	**2800**

YEAR III													
Semester V							**Semester VI**						
Core V & 18U5CHC05	5	5	3	25	75	100	Core VIII & 18U6CHC08	5	5	3	25	75	100
Core VI & 18U5CHC06	5	5	3	25	75	100	Core IX & 18U6CHC09	5	5	3	25	75	100
Core III Practical & 18U6CHCP03	3	0	3	40	60	100	Core III Practical & 18U6CHCP03	3	4	3	40	60	100
Core IV Practical & 18U6CHCP04	5	0	3	40	60	100	Core IV Practical & 18U6CHCP04	4	5	3	40	60	100
Core VII & 18U5CHC07	5	5	3	25	75	100	Core X & 18U6CHC10	5	5	3	25	75	100
EC I & 18U5CHE01	3	3	3	25	75	100	Elective II & 18U6CHE02	4	3	3	25	75	100
SBEC I & 18U5CHS01	3	2	3	25	75	100	SBEC II & 18U6CHS02	3	2	3	25	75	100
Library/Sports	1	0	0	0	0	0	Library/Sports	1	0	0	0	0	0
							Extension work	0	1	0	0	0	100
Total	**30**	**20**	**29**	**245**	**555**	**800**	**Total**	**30**	**30**	**23**	**21**	**205**	**495**
TOTAL CREDIT FOR THE COURSE									**140**	**126**	**1230**	**2970**	**4200**

Distribution Of Duration And Credit Under Different Papers

Part	Paper	Hours/Week	Weeks/Semester	Hour/Paper	No. of Papers	Credit/Paper	Total Hours	Total credit
I	**Language**	4	15	60	4	3	240	12
II	**English**	4	15	60	4	3	240	12
III	**Core paper**	5	15	75	10	5	600	50
III	**Core practical**	4	15	75	4	4/5	600	17
III	**Allied**	5	15	60	4	5	240	20
III	**Allied practical**	4	15	60	2	4	240	8
IV	**Value Education**	6	15	15	2	3	30	6
IV	**SBEC**	3	15	30	3	2	120	6
III	**Elective**	4	15	60	1	4	120	4
IV	**NMEC**	2	15	30	2	2	60	4
IV	**Extension work**	1	15	15	1	1	15	1
TOTAL								**140**

XIII. BLOOM'S TAXONOMY BASED ASSESSMENT PATTERN

K1-Remember; **K2**- Understanding; **K3**- Apply; **K4**-Analyze; **K5**- Evaluate

1. Theory: 75 Marks

(i)Test - I & II and ESE:

Knowledge Level	Section	Marks	Description	Total
K1	A (Answer all)	20 x 01 =20	MCQ/Define	75
K2	B (Either or pattern)	05 x 05=25	Short Answers	
K3& K4	C (Answer 3 out of 5)	03 x 10=30	Descriptive/ Detailed	

Programme Outcomes

P01: To make the students to meet the needs of the region, state and nation to have an edge to compete globally with their adequate knowledge in basic chemistry.

P02: To help the students to think, react and work in innovative ways stimulated by a higher degree of disciplinary synergies that will promote transdisciplinary innovation and divergent thinking.

Programme Specific Outcomes

PS01: To foster a theoretical and practical knowledge on chemistry and its applications and to make responsible citizenships.

PS02: To deliver core and advanced courses on the applied chemistry.

PS03: To deepen learner-capacity for productive scientific thinking both within and beyond the classroom through extensive programmes.

PS04: To cultivate problem solving skills through chemical knowledge to address environmental problems, and to complement and reflect on social needs.

PS05: To develop innovative thinking, generate creative ideas towards scientific knowledge through well-structured seminars and assignments.

SEMESTER I

Programme code	B.Sc.,	**Programme Title**	Bachelor of Science (Chemistry)	
Course Code	18U1CHC01	**Title**	**Batch**	2018-2021
		Part III	**Semester**	I
Hrs/Week	6	Core I – General Chemistry - I	**Credits**	05

Course Objective

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

Course Outcomes (CO)

K1	CO1	To gain an insight into basic chemical concepts.
K2	CO2	To understand the periodic properties and electronic configurations of s, p, d and f block elements.
K3	CO3	To apply the different chemical concepts to different related systems and real time problems.
K4	CO4	To analyze the various atom models.
K5	CO5	To evaluate the magnitude of various possible errors in volumetric analysis.

UNIT–I Electronic structure and periodic properties (12 Hours)

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, ionization energy, electron affinity and electro negativity along the periods and the groups- Factors affecting ionization energy and electro negativity.

SELF-STUDY: Various scales of electronegativity
*PRACTICAL WORK:*List out elements having half filled and completely filled orbital

UNIT–IIBasic concepts in organic chemistry (12 Hours)

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.

SELF-STUDY: Acid character of different acid on the basis of inductive effect.
*PRACTICAL WORK:*Find out the hybridization and geometry of benzene and ethane.

UNIT–IIIGaseous State (12 Hours)

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 behavior - 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.

SELF-STUDY: Work out problem on collosiondiameter ,frequency and number.
*PRACTICAL WORK:*Write gas equations for real gas other than Van der Waals equation.

UNIT–IVBasic Quantum Chemistry (12 Hours)

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.

SELF-STUDY: Practice to write Electronic configuration
*PRACTICAL WORK:*Write the expression for particle in 1D & 3D box.

UNIT–VError Analysis (12 Hours)

Errors and its types - Significant figure, Definitions of molarity, molality, normality and mole fraction. Titration - Back titration - Equivalence point – Indicator – Standard solution - Primary and secondarystandards- Types of titrations - Acid-base and redox. Analysis of basic radicals: Group separation and confirmatory tests for basic radicals.

SELF-STUDY: Basics of volumetric titrations
PRACTICAL WORK: How to prepare 0.1M HCl and 0.5N NaOH.

TOTAL: **75 Hrs.**

Power point Presentations, Seminar ,Quiz, Assignment

TEXT BOOKS

1. Puri B.R., Sharma L.R., Kalia K.K., Principles of Inorganic Chemistry (33rdedition),Vishal publishing co.,(2017).
2. Puri B.R., Sharma L.R., Pathania M.S., Principles of Physical Chemistry, (47thedition), Vishal publishing co.,(2017).
3. Bahl B.S. and ArunBahl, Advanced Organic Chemistry, (22ndedition), New Delhi,S.Chand & Co., (2016).

REFERENCE BOOKS

1. Morrison R.T. and Boyd R.N., Organic Chemistry (7th Edition), Pearson Education,India (2010).
2. Madan.R.D., Inorganic Chemistry (3rd edition), New Delhi, S. Chand and Co., (2012).
3. Mukherji.S.M, Singh.S.P, Kapoor.R.P, Organic Chemistry volume – I (4th edition) New age International (p) limited (1998).

WEB SOURCES:

1. https://chem.libretexts.org/Core/Inorganic_Chemistry/Descriptive_Chemistry/Periodic_Trends_of_Elemental_Properties/Periodic_Properties_of_the_Elements.
2. unicorn.ps.uci.edu/M3LC/lectures/LectureWeek1.pdf

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓

SEMESTER – II

Programme code	B.Sc.,	**Programme Title**		Bachelor of Science (CHEMISTRY)
Course Code	18U2CHC02	**Title**	**Batch**	2018-2021
		Part III	**Semester**	II
Hrs/Week	6	Core II – General Chemistry - II	**Credits**	05

Course Objective

1. To gain knowledge about shapes of inorganic molecules and metallurgy.
2. Acquire the knowledge about hydrocarbons.

Course Outcomes (CO)

K1	CO1	To remember the basic terms, nomenclature, chemical bonding and metallurgy in chemistry and their uses in day to day life.
K2	CO2	To understand the nomenclature, chemical bonding and metallurgy in chemistry further with suitable examples.
K3	CO3	To apply the studied topics for different molecules and compounds.
K4	CO4	To analyze the various extraction techniques
K5	CO5	To evaluate the orbital model of double and triple bond.

UNIT–IChemical bonding (12 Hours)

Ionic bond- factors influencing the formation of ionic bond- characteristics of ionic compounds- lattice energy and its determination 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 orbital - CO and NO.

SELF-STUDY: Study geometry of molecules which is deviated from regular geometry.
PRACTICAL WORK: How to find out bond order, para- and dia-magnetic molecules.

UNIT IIMetallurgy (12 Hours)

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.

SELF-STUDY: Terms of metallurgy like ore ,minerals ,Slag,matte etc..
PRACTICAL WORK: To study the chemical properties of Al, Cu and Fe.

UNIT – IIIAlkanes and Alkenes (12 Hours)

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- Markovnikoff'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.

SELF-STUDY: Draw and practice conformational isomers of substituted alkanes.
PRACTICAL WORK: Write markovnikoff's addition product of hydroboration

UNIT–IVAlkadiene and Alkynes (12 Hours)

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, Oxymercuration– Demercuration, metal ammonia reduction, oxidation and polymerization.

SELF-STUDY: Discuss the reaction of aliphatic diene and aromatic diene
PRACTICAL WORK:Alkynes are show acid nature-Why?

UNIT–V Liquid State (12 Hours)

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.

SELF-STUDY: Basics of boillingpoint,freezing point and melting point.
PRACTICAL WORK: To know Effect of temperature on vapour pressure and Surface tension of different liquids.

TOTAL: 75 Hrs.

Power point Presentations, Seminar ,Quiz, Assignment

TEXT BOOKS

1. Puri B.R., Sharma L.R., Kalia K.K., Principles of Inorganic Chemistry (33rdedition),Vishal publishing co.,(2017).
2. Puri B.R., Sharma L.R., Pathania M.S., Principles of Physical Chemistry, (47thedition), Vishal publishing co.,(2017).
3. Bahl B.S. and ArunBahl, Advanced Organic Chemistry, (22ndedition), New Delhi,S.Chand & Co., (2016).

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1. Morrison R.T. and Boyd R.N., Organic Chemistry (7th Edition), Pearson Education,India (2010).
2. Madan.R.D., Inorganic Chemistry (3rd edition), New Delhi, S. Chand and Co., (2012).
3. Mukherji.S.M, Singh.S.P, Kapoor.R.P, Organic Chemistry volume – I (4th edition) New age International (p) limited (1998).

WEB SOURCES:

1. https://www.khanacademy.org/science/biology/chemistry--of-life/chemical-bonds-and-reactions/v/ionic-covalent-and-metallic-bonds
2. https://www.cliffsnotes.com/study-guides/chemistry/organic-chemistry-i/structure-and-properties-of-alkanes/alkanes-physical-properties
3. https://chem.libretexts.org/
4. http://www.chem.tamu.edu/class/fyp/mcquest/mcquest.html
5. http://nptel.ac.in/courses/104103069/15

Mapping

PSO / CO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓

SEMESTER - II

Programme code	B.Sc.,	**Programme Title**	Bachelor of Science (Chemistry)	
Course Code	**18U2CHCP01**	**Title**	**Batch**	2018-2021
		Part III	**Semester**	II
Hrs/Week	3	Core Practical - I	**Credits**	05

Course Objective

1. To understand the principles of volumetric analysis.
2. To enable the students to have hands-on training on preparation of simple inorganic complexes.

Course Outcomes (CO)

K1	CO1	Students will learn how to make solutions and do the titrations with different kinds.
K2	CO2	Students will understand reactions taking place during the experiment.
K3	CO3	The students will be able to apply the knowledge about nature, significance, and influence of errors and to be avoided or minimized during quantitative examination of experiment.
K4	CO4	Students will analyze the given samples volumetrically
K5	CO5	To evaluatethe known techniques to prepare, recrystallize and finding melting point of simple inorganic compound.

VOLUMETRIC ESTIMATIONS

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

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.

III. Iodometry

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

dichromate.

IV. Dichrometry

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

INORGANIC PREPARATIONS

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

CONTENT BEYOND THE SYLLABUS

1. Estimate the hardness of water using EDTA.
2. Estimation of sulphuric acid- standard oxalic acid

TEXT BOOK

1. V. Venkateswaran, R. Veeraswamy and A.R.Kulandaivelu, Basic Principles of Practical Chemistry, New Delhi, S.Chand& Co, (1995).

REFERENCE BOOKS

1. PandeyO. P, BajpaiD. N., GiriS., Practical Chemistry, New Delhi, S.Chand& Co, (2012)

ONLINE SOURCES

1. https://byjus.com/chemistry/volumetric-analysis/
2. https://chem.libretexts.org

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓

SEMESTER – I

Programme code	B.Sc.,	**Programme Title**	Bachelor of Science (Biochemistry)	
Course Code	**18U1CHA01**	**Title**	**Batch**	2018-2021
		Part III	**Semester**	I
Hrs/Week	5	Allied Chemistry - I	**Credits**	05

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.

K1	CO1	Students will learn of bonding, anti bonding and non bonding and Interhalogen compounds, various organic reaction mechanism, paramaceutical and soil chemistry.
K2	CO2	Students will understand the mechanism of various organic reactions, basics of volumetric analysis.
K3	CO3	The students will be able to apply the knowledge to prepare various conccentration solution.
K4	CO4	Students will analyze the properties of portable water
K5	CO5	Students will evaluate bond order, magnetic properties and types of bond of hetero molecules with the knowledge of homo molecules.

UNIT-I : Chemical bonding and Aromaticity(12 Hours)

1.1.Chemical Bonding –Definition- types -Ionic bond and covalent bond, hydrogen bond -formation and characteristics properties -bond order- magnetic properties.

1.2. Structure of NaCl, CaF_2

1..3 MO theory--bonding in H_2, O_2, N_2 using MO theory -bonding -bond order- magnetiic properties.

1..4Aromaticity –Huckels rule-types –Examples.

SELF-STUDY: discuss chemical bonding types and aromatic characters
PRACTICAL WORK: bond order changes – why

UNIT-II: Acid and Base theory (12 Hours)

2.1.Arrhenius concept - Lowry-bronsted theory -Lewis acid and base theory – Conjugated Acid and base-Strength of an Acid and base.

2.2.Principle and Classification of Hard acid and Base –Soft Acid and base (HSAB) .

2.3 Acidity of water – Alkalinity-PH –hardness of water- types of hardness -methods RO and Zeolite process.

SELF-STUDY:concepts of acid and base
PRACTICAL WORK: water analysis

UNIT-III: Volumetric analysis (12 Hours)

3.1.Law of Volumetric analysis- Definitions of molarity, molality, normality and mole fraction.

3.2.Titration - Back titration - Equivalence point – Indicator – Standard solution - Primary and secondarystandards- Types of titrations - Acid-base and redox.

SELF-STUDY: fundamentals of titrations

PRACTICAL WORK: standard solution preparation

UNIT-IV: Pharmaceutical Chemistry-I (12 Hours)

4.1.Definition of the terms – Drug, Pharmacy, Pharmacophore, Pharmacodynamics and Pharmacopoeia.

4.2.Antibiotics - Definition, classification – broad and narrow spectrum antibiotics. penicillin, chloramphenical and erythromycin - structure and uses (structure elucidation not needed).

4.3.Sulpha drugs- preparation of sulphaguanine and sulphathiazole. Mechanism and mode of action of sulpha drugs.

SELF-STUDY: antibiotics structures

PRACTICAL WORK: medical treatment

UNIT-V:**AgriculturalChemistry (12 Hours)**

5.1.Soil types-red soil, black soil, alluvial soil, desert soil, red soil; role of humus: Manures and their importance.

5.2.Chemical fertilizers: Natural and synthetic fertilizers: Classification of NPK fertilizer- Preparation of Urea, Ammonium sulphate, Triple super phosphate potassium nitrate; role of macronutrients and micronutrients.

5.3.Pesticides: classification-insecticides, herbicides and fungicides; Structure of important pesticides: DDT, BHC.

SELF-STUDY: soil and fertilizers details

PRACTICAL WORK: analysis of natural

CONTENT BEYOND THE SYLLABUS

1. Discuss the factors affecting electophilic and nucleophilic substitutionreaction.
2. List out various acid base indicator.
3. List out some other applicaations of chloramphenical and erythromycin.

TEXT BOOKS

1. Puri B.R., Sharma L.R., Kalia K.K., Principles of Inorganic Chemistry (33rd edition), Vishal publishing co.,(2017).
2. JayashreeGhosh .S, Fundamental concepts of Applied Chemistry, New Delhi, S. Chand & Co., (2008).
3. Sharma B.K., Industrial chemistry including chemical engineering (16th), Meerut, Krishnaprakasam media., (2011).
4. Bahl B.S. and ArunBahl, Advanced Organic Chemistry, (22nd edition), New Delhi, S. Chand & Co., (2016).
5. Dr.R.D.Madan,Modern inorganic chemistry,(3rd edition), New Delhi,S. Chand & Co., (2014).
6. Puri B.R., Sharma L.R., Pathania M.S., Principles of Physical Chemistry (23rdedition)

   New Delhi, S. Chand &Co., (2004).

REFERENCE BOOKS

1. Puri B.R., Sharma L.R., Pathania M.S., Principles of Physical Chemistry , (47th edition), Vishal publishing co.,(2017).
2. JayashreeGhosh, Text Book of Pharmaceutical Chemistry, S. Chand, New Delhi, (1999).
3. Puri B.R., Sharma L.R., Kalia K.K., Principles of Inorganic Chemistry (50th edition), New Delhi, S. Chand &Co., (2011).

ONLINE SOURCES

1. http://www.sparknotes.com/chemistry/bonding/molecularorbital/section1.rhtm
2. http://www.organic-chemistry.org/namedreactions/nucleophilic-substitution-sn1-sn2.shtm
3. http://www.soest.hawaii.edu/oceanography/courses/OCN633/Fall%202013/Titrimetry.pdf
4. https://chem.libretexts.org/

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓

SEMESTER II

Programme code	B.Sc.,	**Programme Title**	Bachelor of Science (Biochemistry)	
Course Code	**18U2CHA02**	**Title**	**Batch**	2018-2021
		Part III	**Semester**	II
Hrs/Week	5	Allied Chemistry - II	**Credits**	05

OBJECTIVES

1. To familiarize students with various chromatographytechniques 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.
3. To educate the students about the qualitative analysis of organic compounds.

K1	CO1	Students will be able to understand the concept of various chromatographic techniques.
K2	CO2	Students will know the details of bio organic compounds and bio inorganic compounds.
K3	CO3	Students will gain knowledge of antipyretics, analgesic, antiseptics, disinfectants and anesthetics
K4	CO4	To analyze the structure of different haem proteins.
K5	CO5	Students will evaluate the different pharmaceutically important compounds and their uses in real life.

UNIT-I: Chromatography (12 Hours)

1.1 Chromatography –definition-types- column, paper, thin layer –method of separation application-Difference between paper chromatography and thin layer chromatography.

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

SELF-STUDY: Chromatography techniques

PRACTICAL WORK: layers working

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

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).

SELF-STUDY: peptides and glucose
PRACTICAL WORK: analysis of carbohydrates

UNIT-III: Bio-inorganic Chemistry (12 Hours)

Structure of chlorophyll, phorphyrin unit and photosynthesis.Nitrogen fixation, carbon cycle.structure of haem proteins: haemoglobin, myoglobin. Oxygen transport and respiration.Metallo enzymes, vitamins containing metals.

SELF-STUDY: iron compounds
PRACTICAL WORK: enzymes studies

UNIT-IV: Pharmaceutical Chemistry-II (12 Hours)

Structure and mode of action: Analgesics and Antipyretics-salicylic acid derivatives-aspirin, p-aminophenol derivatives- paraacetamol 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.

SELF-STUDY: antiseptics formation
PRACTICAL WORK: pharmacy details

UNIT-V: Organic Analysis (12 Hours)

Qualitative analysis of organic substances: test for saturation and unsaturation; aliphatic & aromatic; acidic and basic nature of organic compound; elements test for N, S and halogens: functional groups like acid, phenol, aldehyde, ketone, carbohydrate, amine, ester, amide and diamide.

SELF-STUDY: qualitative analysis
PRACTICAL WORK: estimations

CONTENT BEYOND THE SYLLABUS

1. List out stationary and mobile phases used in HPLC and TLC.
2. Make the discussion of secondary,tertiary and quaternary structure of protein
3. Write conformation tests for nitro compound and phenol.

TEXT BOOKS

1. Puri B.R., Sharma L.R., Kalia K.K., Principles of Inorganic Chemistry (50th edition), New Delhi, S. Chand & Co., (2011).
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 ArunBahl, Advanced Organic Chemistry, (19th edition), New Delhi, S. Chand & Co., (2010).
4. V. Venkateswaran, R. Veeraswamy and A.R.Kulandaivelu, Basic Principles of Practical Chemistry, New Delhi, S.Chand& Co, (1995).
5. Pandey.O.P, Bajpai.D.N.,Giri.S., Practical Chemistry, New Delhi, S.Chand& Co, (2012).

REFERENCE BOOKS

1. JayashreeGhosh .S, Fundamental concepts of Applied Chemistry, New Delhi, S. Chand & Co., (2008).
2. Sharma.B.K., Industrial chemistry including chemical engineering (16th) Meerut, Krishnaprakasam media. (2011).

ONLINE SOURCES

1. https://www.khanacademy.org/test-prep/mcat/chemical-processes/separations-purifications/a/principles-of-chromatography.
2. https://en.wikipedia.org/wiki/Carbohydrate.
3. https://chem.libretexts.org/

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓

SEMESTER – II

Programme code	B.Sc.,	**Programme Title**	Bachelor of Science (Biochemistry)	
Course Code	**18U2CHAP01**	**Title**	**Batch**	2018-2021
		Part III Group-A. Allied Chemistry Practicals–I	**Semester**	II
Hrs/Week	3		**Credits**	05

Course Objective

To understand the principles of volumetric analysis.

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

Course Outcomes (CO)

K1	CO1	Students will learn how to conduct a volumetric estimation process precisely. .
K2	CO2	Students will understand reactions taking place during the experiment.
K3	CO3	Students will plan, conduct, review and report the experiment.
K4	CO4	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. Students will gain knowledge about analysis of organic compounds.
K5	CO5	Students will evaluate the reactivity of various functional groups.

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. Permanganometry

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.

CONTENT BEYOND THE SYLLABUS

1. Estimate the hardness of water using EDTA.
2. Estimation of sulphuric acid- standard oxalic acid

TEXT BOOKS

1. V. Venkateswaran, R. Veeraswamy and A.R.Kulandaivelu, Basic Principles of Practical Chemistry, New Delhi, S. Chand & Co, (1995).

REFERENCE BOOKS

1. Pandey O. P, Bajpai D. N., Giri S., Practical Chemistry, New Delhi, S.Chand& Co, (2012).

ONLINE SOURCES

1. http://wwwchem.uwimona.edu.jm/lab_manuals/c10expt25.html
2. http://vlab.amrita.edu/?sub=2&brch=191&sim=345&cnt=1
3. http://amrita.olabs.edu.in/?sub=73&brch=8&sim=116&cnt=1

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓

VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN

(AUTONOMOUS)

DEPARTMENT OF CHEMISTRY

B.Sc. DEGREE EXAMINATION - II SEMESTER

MODEL QUESTION- GENERAL CHEMISTRY – I

Time: 3 Hours Max. Marks: 75

PART – A (20 x1 = 20 Marks)
Answer all the questions

1. Which of the following has half fiiledstability
   a)Fe b)Cr c)Mn d)Zn
2. Which of the following has the electronic configuration of $1s^2\ 2s^2\ 2p^6\ 3d^5\ 4s$
   a)Mn b)Fe c)Co d)Cr
3. Which has the highest Ionisationpotential
   a)Na b)Mg c)Si d)P
4. For n=1,Write the values of l,m and s.
   a) 1,0,±1/2 b)0,0, ±1/2 c)0,1, ±1/2 d)1,1,±1/2
5. Which is having SP^3Hybridisation.
   a)C_4H_4 b)CH_2 c)C_2H_2 d)CH_4
6. Select the strong acid of the followings.
   a)CH_3COOH b)$Cl_2CHCOOH$ c)Cl_3CCOOH d)$ClCH_2COOH$
7. which is the polar covalent bond.
   a)H-H b)Cl-Cl c)H-F d)O=O
8. Choose the most stable carbocation.
   a)CH_3^+ b)$CH_3CH_2^+$ c)$CH(CH_3)_2$ d)$C^+(CH_3)_3$
9. At STP 10 gm of a gas occupy 2 lit at what temp will volume become double.
   a)273K b)-273^0C c)546K d)546^0C
10. For a gas having n molecules per unit volume moving with a average speed of c m/sec
and diameter σm the mean free path is
   a)$\sqrt{2}\pi\sigma^2N$ b) $\sqrt{2}\pi\sigma^2CN$ c)$1/\sqrt{2}$ *$\pi\sigma^2CN$ d)$1/\sqrt{2}\pi\sigma^2N$
11. If the mean free path of a gas at 760 torr is λ. What will be its value at 5 atmpressure.
   a) λ/5 b) 5 λ c) 5 λ /760 d) λ^2.
12. The diameter of molecule B is half that of molecule A. The ratio of mean free path (λ_A/λ_B) will be
   a)1/2 b)1/4 c) 4 d) 2
13. The wave character of an electron was experimentally verified by
   a) Einstein b)de droglie c) Germer d)Planck
14. Heisenberg's uncertainity principle precludes the exact simultaneous measurement of

a) charge density and probability b) position and momentum
c)position and direction d) velocity and energy

15.The de broglie relationship can be expressed as
a) h = λ/mv b) λ = h/mp c) λm = v/h d) λ = h/mv

16. The dumb- bell was the shape of
a) p- orbital b) s- orbital c) d-orbital d) f-orbital

17. Write the significant figure of 0.000274
a) 2.74×10^{-5} b) 2.74×10^{-4} c) 2.74×10^{-2} d) 2.74×10^{-3}

18. Normal solutions can be prepared with
a) molecular weight in grams b) molecular weight in litre
c) equivalent weight in grams d) atomic weight in grams

19.Give an example for acid-base titration
a) HClvsNaCl b) NH_4OH vsNaOH C) HClvsNaOH d)NH_3vsHCl

20.What is the colour of phenolphthalein in basic medium.
a) orange b) yellow c)pink d)colourless

PART – B (5 x 5 = 25 Marks)

Answer all the questions

21. (a) Explain the extra stability of half filled and completely filled orbitals.
(OR)
(b) Discuss the factors affecting Ionisation Energy.

22. (a) Explain sp^3&sphybridisation with examples (OR)
(b) Explain covalent bond properties of organic molecules.

23. (a) Drive ideal gas equation
(OR)
(b) Explain the terms collision diameter, collision frequency, collision number

24. (a) What are the differecnces between orbit & orbitals?
(OR)
(b) Explain Davisson Germer experiment.

25. (a) Explain the types of errors.
(OR)
(b) Write short note on complexometric titrations.

PART – C (3 x 10 = 30 Marks)

Answer ANY three of the following questions

26. Discuss Quantum numbers and their significance.
27. Explain in detail about inductive effect with examples.
28. Drive Vander waals equation for real gases.
29. Discuss i)photoelectric effect ii)Compton effect .
30. Explain different type of titrations

18U2CHC02

VIVEKANANDHA COLLEGE OF ARTS & SCIENCES FOR WOMEN

(AUTONOMOUS)

DEPARTMENT OF CHEMISTRY

B.Sc., DEGREE EXAMINATION - II SEMESTER

MODEL QUESTION- GENERAL CHEMISTRY – II

Time: 3 Hours Max. Marks: 75

PART – A (20 x1 = 20 Marks)

Answer all the questions

1. What are the factors affecting the formation of ionic bond.
   a) low ionization energy b) high electron affinity
   c)high lattice energy of ionic bond d) all the above.
2. Which one of the following is covalent molecule.
   a) HF b) H_2 c) NaCl d) NaOH.
3. Name the molecule which has partial ionic character.
   a) F2 b) H2 c) HF d) none of the above.
4. Identify the combination which greatly distort regular geometry.
   a) lp-lp repulsion b) lp-bp repulsion
   c) bp-bp repulsion d) none of the these.
5. Sulphide ores are concentrated by
   a) magnetic separation b) froath floatation
   c) gravity separation d) hydraulic washing.
6. Heat of ore in presence of air is called
   a) calcination b) roasting c) smelting d) none of these.
7. Name the element purified by electrolysis method.
   a) Al b) Cu c) Fe d) U.
8. What is the ore of aluminium.
   a) ferrite b) cuprite c) bauxite d) aluminate.
9. Write the general molecular formula of alkanes
   a) C_nH_{2n+2} b) C_nH_{2n-2} c) C_nH_{2n} d) C_nH_{2n-1}

10. Catalytic hydrogenation of ---------- producing alkanes.
    a) alkanes b)alkadienes c)alkenes d)polyenes.
11. What is the first step of free radical substitution reaction.
    a) propagation b)initiation c)coupling d)termination.
12. Order of reactivity for the addition of hydrogen halides in alkenes.
    a) HCl>HBr> HI b) HI >HBr>HCl c) HBr> HI >HCl d) HI >HCl>HBr
13. Which one the following is allenes.
    a) CH_2=CH-CH=CH_2 b) CH_2=C=CH_2 c) CH_2=CH-CH_2-CH_3 d) none of these.
14. Which one of the following product is thermodynamically stable for the 1,2 and1,4 addition of butadiene.
    a) 1,4 adduct b) 1,2 adduct c) both d) none.

15.Which is more acidic of the following

a) $CH_2=CH_2$ b)CH_3-CH_3 c) CH≡CH d) all the above.

16.R-C≡C-H + $Br_2 \rightarrow$?

a)R-CBr = CBr-H b) R- $C(Br)_2 - CH_3$ c) R-CH_2- $C(Br)_2$–H d) none of these.

17.Effect Of Temperature On Vapour Pressure

a) increase b) decrease

c) no changes d) increase and then decrease

18.Which Of the following has high viscosity

a) water b) acetic acid c) benzene d) chloroform

19.Water has spherical shape due to----------

a) surface tension b) surface pressure c) interfacial tension d) none

20.The substance which rotate the plane polarized light in right hand side is called-----

a) dextro b) laevo c) racemic d) none

PART – B (5 x 5 = 25 Marks)

Answer all the questions

21. a) Draw MO diagram for F_2 molecule (OR)

b) Explain Fajan's rule and its applications.

22. a) Write a note on froth floatation process. (OR)

b) Explain the extraction of Cu.

23. a) Write note on conformational study of ethane. (OR)

b) Explain Markownikoff's rule and peroxide effect with example .

24. a) Explain the structure of allene and butadiene . (OR)

b) Explain the mercuration and oxymercuration reaction of acetylene.

25. a) Define surface energy .Explain the surface active reagents . (OR)

b) Explain the determination of vapour pressure by dynamic method.

PART – C (3 x 10 = 30 Marks)

Answer ANY three questions

26.Explain VSEPR theory and shapes of simple covalent molecules.

27. Explain the extraction of Iron and its properties, uses.

28. a) Explain Hofmann and saytzeff's rule.

b) Write the chemical reactions of alkenes

29. a) Explain the mechanism of Electrophilic addition in alkynes.

b) Write a note on 1,2 and 1, 4 addition of butadiene with example.

30. a) Explain classification of liquid crystals.

b) Explain the effect of temperature on viscosity.

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)

DEPARTMENT OF CHEMISTRY

B.Sc., DEGREE EXAMINATION

MODEL QUESTION- ALLIED CHEMISTRY – I

(BIO-CHEMISTRY)

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

PART – A(20 x1 = 20 Marks)

Answer all the questions

1.Which of the following is example for ionic bond.?

a)NaCl b)Cl_2 c)F_2 d)KCl

2. NaCl crystal has a ..... structure.

a) Tetrahedral (b) Trigonal (c) Octahedral (d) hexagonal

3.Covalent bond involves _____of electrons

a) Sharing b)Transfering c) both d)none

4.What is the bond order for O2 molecule?

a) 1 b) 2 c) 0 d) 3

5.Which one of the following is aromatic compound?

a) Benzene b) alkene c)Acetylene d)chlorine

6. pH of an alkaline water will be .....

a) zero (b) low (c) high (d) none of the above

7.**----------**refers to the capability of water to neutralize a base.

a)Acidity b)Alkalinity c)RO d)Zeolite

8.Hardness of water is due to the presence of ____

a)Calcium b) Ammonium c)Magnesnium d)Ammonium

9.Give an example for primary standard solution

a) Oxalic acid b) NaOH c)KMnO4 d)$Na_2S_2O_3$

10.Oxalic acid VsNaOH is an example for _____titration

a) Acid base b) Redox c)Conductometric d)Complexometric

11.Number of Gram Equivalence per litre of solution is termed as------

a) Mole fraction b)Molality c)Normality d)Molarity

12.The solution whose strength is known as----------solution.

a) Primary b)Secondary c)both d)none

13.The structural unit which is responsible for activity of drug is termed as ------

a)Pharmacopore b) Pharmacokinetics c)Pharmacology d)Pharma

14._____is used to kill micro organism

a) Antibiotics b) Antipyrectic c)Analgesics d)none

15.Sulpha drugs contains----------group

a) sulphonyl b)amine c)acid d)aldehyde

16.The first isolated antibiotic is called----------.

a) Penicillin b)chlorophenicol c)Tetraxylene d)sulphathiazole

17.Give an example for nitrogenous fertilizer..

a)Urea b)KCN c)K_2SO_4 d)all

18.---------- is a substance that is toxic to plants used to destroy unwanted vegetation.

a) Herbicides b)Fungicides c)rodenticide d) all

19. --------soil containadquateamoount of potash, lime and phosphoric acid.

a) Alluvial soil b) Black soil c)Red soil d)all

20. DDT stands for ----------

a) Dichlorodiphenyltrichloroethane b) Dichlorodiphenyltrichloromethane

c) Dichlorodiphenylethane c) Dichloromethyltrichloroethane

PART – B(5 x 5 = 25 Marks)

Answer all the questions

21. (a) Explain the characteristics of ionic bond (OR)

(b) Draw the structure of NaCl and explain its nature of bonding.

22. (a) Explain Arrhenius concept of acid and bases. (OR)

(b) Write short note on conjugate acid and bases.

23. (a) Define the following terms i)Molarity ii) Normality (OR)

(b)Write short notes on standard solution and explain its types.

24. (a) Write the preparation for sulphaguanine and sulphathiazole. (OR)

(b)Give an brief account on antibiotics.

25. (a) Describe the different types of soils. (OR)

(b) (i) Explain the classification of nitrogeneousfertiliser with examples.

PART – C(3 x 10 = 30 Marks)

Answer ANY thereof the following questions

26.Explain the formation of covalent bond with two examples.

27. Explain the classification of acid and bases with examples.

28. Give an account on Acid –base and redox titration.

29. Explain the mechanism and mode of action of sulpha drugs.?

30. Explain the classification of pesticides.

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN

(AUTONOMOUS)

DEPARTMENT OF CHEMISTRY

B.Sc. DEGREE EXAMINATION

MODEL QUESTION- ALLIED CHEMISTRY – II

(BIO-CHEMISTRY)

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

PART – A(20 x1 = 20 Marks)

Answer all the questions

1.Which technique is used to separate the the compounds on the basis of difference in affinities of phase

a)Chromatography b) Polarography

c)Thermography d)Chromography

2.In which type of chromatographic separation occurs due to difference in partition co-efficients?

a)Paper b)Column c)Thin layer d)Gas

3.Rf value is the distance travelled by the compound to the distance travelled by the ----

a)solvent b)solute b)elution d)all

4. Which type of chromatography is applied to coloured and colourlesssubstance

a)Paper b)Column c)Thin layer d)HPLC

5.Amino acids contain ----- functional groups

a)1 b)2 c)3 d)4

6. --------- is the pH at which the amino acid does not migrate in an electric field.

a)Isoelectric point b)electric point c)Electronic point d)none

7. The amino acids in a polypeptide chain are linked by ---------- bonds.

a)peptide b)amino bond c)covalent d)ionic

8. Aldehyde group present in carbohydrate is known as------

a) Aldose b)ketose c)hexose d) sucrose

9.Vitamins are classified into ----- types.

a) 2 b)3 c)3 d)5

10.Which element present in the chiorophyll ?

a)Mg b)Ca c)P d)CO

11.Basic unit of Phorphyrin

a)Indole b) Imdazole c)Quinole d)Pyrole

12.Which element is present in the haemoglobin?

a) Cu b)Ag c) Fe d)Au

13.Which metal found in vitamin $B_{12?}$

a) Co b) Cu c)Mg d)Sn

14.Which one is example for Narcotic analgesics?

a)Morphine b)Papaverine c)salicyladehyde d)Benzoic acid

15.Salicyladehyde group of Aspirin

a)$COOCH_3$ b) CHO c)Cl d)No_2

16. p-aminophenol used for

a) Pain reliver b)Anti-inflammatory

c)Anti-septicsagen d)anti-bacterial drugs

17. Which among the following compound found only in liquid nature ?

a)amine b)acid c)monoamide d)all

18.Which compound shows aliphatic nature.?

a) Carbohydrate b) amine c) monoamide d)acid

19.Which among the following compounds contain nitrogen ?

a)Aldehyde b)amine c)acid d)alcohol.

20.Which test gives positive result for amides.?

a)Biuret test b) Silver mirror test

c)Lieberrmanns test d)Phthalein fusion test.

PART – B(5 x 5 = 25 Marks)

Answer all the questions

21. (a) Difference between paper and column chromatography. (OR)

(b) Write short notes on methods of separation of column chromatography.

22. (a) Explain the preparation of amino acids by Gabriel method. (OR)

(b) Write the preparation of glucose.

23. (a) Explain the structure of protein. (OR)

(b) Write short notes on nitrogen fixation.

24. (a) Explain the mode of Action of paracetamol& ibuprofen. (OR)

(b) Explain the analgesics with examples.

25. (a) Explain the classification of dye based on its structure. (OR)

(b) Explain the basic operations in dyeing process.

PART – C(3 x 10 = 30 Marks)

Answer ANY three of the following questions

26. Explain the instrumentation and application of HPLC.

27. Explain primary structure of proteins &its function

28. Explain oxygen transport and respiration.

29. Explain the classification of Anesthetics with example.

30. How will you identify the given organic compound as phenol and aldehyde?