	KADI SARVA VISHWAVIDYALAYA					
	B.SC CHEMISTRY SEMESTER - 6 SCHEME					
Subject Code	**Course**	**Instructions Hrs / week**	**Examination**			**Credit**
			Internal	**University Exam**	**Total**	
CCH-601	Inorganic Chemistry - III	3	30	70	100	3
CCH-602	Organic Chemistry - III	3	30	70	100	3
CCH-603	Physical Chemistry - III	3	30	70	100	3
CCH-604	Analytical Chemistry - III	3	30	70	100	3
FCG-601	(University Elective) Basic English – VI	2	15	35	50	2
EGC-601	(Generic Elective - Institute elective) Personality Development & Interview Skills	2	50	00	50	2
SE CH 601-A	(Discipline Specific Specialization) Dyeing & Printing of Dyes	2	50	00	50	2
SE CH 601-B	(Discipline Specific Specialization) Bio-Polymers					
SE CH 601-C	(Discipline Specific Specialization)					
PCH-601	Chemistry Practical - VI	12	0	200	200	6
Total		**30**	**235**	**515**	**750**	**24**

KADI SARVA VISHWAVIDYALAYA
B.Sc Semester 6 Syllabus (W.E.F. June 2019)

CCH-601- Inorganic Chemistry - III

RATIONALE: This course is designed to enable students to acquire basic understanding of the Inorganic Chemistry. Basic properties of inorganic chemistry are taught to make the students aware about it.

LEARNING OUTCOMES:

- Understand the concept of origin of inorganic chemistry.
- Develop an understanding of the reaction mechanism occurring in any chemical reaction.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of Mid Term examinations for 30 marks and End Term Examination conducted by University examination for 70 marks.

Subject Code	Subject Title	Credits	Theory			Total Marks
			Hrs.	Max Marks		
				Mid Term	End Term	
CCH-601	Inorganic Chemistry – III	3	45	30	70	100

COURSE CONTENT

UNIT :- I : Hybridization
Number of lectures: 15 **Weightage:34%**

- Variation method, Secular Equation, Stability of H_2^+ ion; M.O. approach, Stability of H_2 molecule; V. B. approach, Classical interaction energy
- Representation of wave function for SP, SP^2 and SP^3 hybrid orbitals, bond angle and bond strength
- M.O. treatment of Oh molecules
- Quantum mechanical representation of Pauli's exclusion principle

UNIT :- II : Metal Carbonyl
Number of lectures: 15 **Weightage:33%**

- Introduction
- Classification: Mononuclear and Polynuclear Physical and Chemical Properties
- Metal Carbonyl (M-CO) bonding (On the basis of V.B.T. and M.O.T.) Use of IR Spectra to determination of structure of metal carbonyl
- Structure of Metal Carbonyl
  - $Ni(CO)_4$,$Fe(CO)_5$,$Cr(CO)_6$,$Fe_2(CO)_9$,$Co_2(CO)_8$,$Mn_2(CO)_{10}$, $Fe_3(CO)_{12}$
- Calculation of EAN of metal atom in metal carbonyl Metal Nitrosyl complexes: - Bonding in metal nitrosyl, Classification of metal Nitrosyl

UNIT :- III : Boron Hybride
Number of lectures: 15 **Weightage:33%**

- Synthesis , physical and chemical Properties of Boranes
- Bonding and structure of boranes
- Classification of boranes (closo, nido, arachno)
- Structure and bonding of B_2H_6, B_4H_{10}, B_5H_9, B_5H_{11}

Books Suggested (Inorganic Chemistry)

1. Valency and Molecular structure by Cartmell and Fowles.
2. Inorganic Chemistry: Principles of Structure and Reactivity by James E. Huheey, Ellen A. Keiter, Richard L. Keiter, Okhil K. Medhi
3. Advanced Inorganic Chemistry by G. D. Tuli, Madan, Basu and Satyaprakash
4. Bioinorganic Chemistry by G. R. Chatwal
5. Quantum chemistry by R. K. Prasad
6. Concise inorganic Chemistry by J. D. Lee

INSTRUCTION STRATEGIES

1. Interactions with the students to understand the level of students
2. Explaining & Discussing the major terminologies related to Chemistry
3. Teaching the topics included in the syllabus with the help of teaching aids like OHP, LCD (Power point presentation), Notes, Question Banks, References and Reprints / Copy of Articles, Models, Diagrams
4. Assistance in solving of questions from our question bank.

TEACHING AND EXAMINATION

UNIT	Examination Scheme %Weightage	Teaching Scheme No. of Lecture
Unit I	34	15
Unit II	33	15
Unit III	33	15
Total	100	45

KADI SARVA VISHWAVIDYALAYA
B.Sc Semester 6 Syllabus (W.E.F. June 2019)

CCH-602- Organic Chemistry - III

RATIONALE: This course is designed to enable students to acquire basic understanding and the importance of Organic Chemistry.

LEARNING OUTCOMES:

- Understand the concept of analytical chemistry.
- Applications of inorganic compounds

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of Mid Term examinations for 30 marks and End Term Examination conducted by University examination for 70 marks.

Subject Code	Subject Title	Credits	Theory			Total Marks
			Hrs.	Max Marks		
				Mid Term	End Term	
CCH-602	Organic Chemistry – III	3	45	30	70	100

COURSE CONTENT

UNIT :- I : Electrophillic and free radical addition reaction
Number of lectures: 15 **Weightage:34%**

- Addition to carbon carbon double bond Markovnikov's rule
- Electrophillic addition, Orientation, Reactivity, Rearrangement, Dimerization, Alkylation
- Peroxide effect (Anti markovnikov`s rule)
- Free radical addition, mechanism of peroxide initiated addition of HBr Syn and anti addition mechanism for addition of halogens

- Electrophillic addition to conjugated dienes (1: 2 v/s 1: 4 addition) Free radical addition to conjugated dienes, reactivity

UNIT :- II :
Number of lectures: 15 **Weightage:33%**
(A) Active Methylene Group Compounds

- Introduction of Tautomerism
- Determination of keto-enol tautomerism
- Differences between Tautomerism and resonance
- Synthesis and application of Ethyl aceto acetate and malonic ester

(B) Isoprenoids

- Classification
- General methods of structure determination Isoprene rule
- Constitution of Citral and α-Terpeneol and their synthesis

UNIT :- III Number of lectures: 15 Weightage:33%

Carbohydrates

- Introduction of Disaccharides Structure determination of
  - Sucrose
  - Maltose
- Introduction of Polysaccharides Structure determination of
  - Starch
  - Cellulose

Books Suggested (Organic Chemistry):

1. Organic chemistry by Morrison & Boyd Vth Edition
2. Advance organic chemistry by R.K.Bansal.
3. Organic chemistry by I.L.Finar Vol I &.II Vth Edition
4. Organic chemistry by pine, Hendrikson, Cram and Hammond IVth edition.
5. Synthetic organic chemistry by Gurdeep R Chatwal.
6. Advanced organic chemistry by Jerry March.
7. Organic reactions and their mechanisms IInd edition by P.S. Kalsi.
8. Organic chemistry of natural product Vol: I & II by Gurdeep R. Chatwal.
9. Advanced organic chemistry by Arun Bahal and B.S. Bahal.

Organic chemistry Vol, I, II, III by S.M.Mukherjee, S.P.Singh, R.P.Kapoor.

INSTRUCTION STRATEGIES

1. Interactions with the students to understand the level of students
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3. Teaching the topics included in the syllabus with the help of teaching aids like OHP, LCD (Power point presentation), Notes, Question Banks, References and Reprints / Copy of Articles, Models, Diagrams
4. Assistance in solving of questions from our question bank.

TEACHING AND EXAMINATION

UNIT	Examination Scheme %Weightage	Teaching Scheme No. of Lecture
Unit I	34	15
Unit II	33	15
Unit III	33	15
Total	100	45

KADI SARVA VISHWAVIDYALAYA
B.Sc Semester 6 Syllabus (W.E.F. June 2019)

CCH-603- Physical Chemistry - III

RATIONALE: This course is designed to enable students to acquire basic understanding and the importance of Physical Chemistry.

LEARNING OUTCOMES:

- Understand the concept of Physical chemistry.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of Mid Term examinations for 30 marks and End Term Examination conducted by University examination for 70 marks.

Subject Code	Subject Title	Credits	Theory			Total Marks
			Hrs.	Max Marks		
				Mid Term	End Term	
CCH-603	Physical Chemistry – III	3	45	30	70	100

COURSE CONTENT

UNIT:- I : Statistical Thermodynamics
Number of lectures: 15 **Weightage:34%**

- Introduction
- Combination and permutation
- Probability
- Sterling approximate formula (No Derivation)
- Type of Statistics
  - Maxwell-Boltzmann Statistics
  - Bose-Einstein Statistics
  - Fermi-Dirac Statistics
- Partition Function
  - Translational Partition function
  - Rotational Partition function
  - Vibrational Partition function
  - Numericals

UNIT :- II : Phase Rule
Number of lectures: 15 **Weightage:33%**

- Overview of Phase, component, degree of freedom
- Derivation of Phase Rule

- One component system
- Phase diagram of water system and sulfur system CO_2 system
- Two component system
- Simple eutectic system Ag-Pb, Zn-Mg, Condensation Phase Rule.

UNIT :- III : Chemical Kinetics Number of lectures: 15 Weightage:33%

- Effect of temperature on rate of reaction (Arrhenius equation)
- Concept of Activation energy
  Theories of reaction rate
  - Collision theory
  - Transition state theory
- Comparison of collision and transition state theory
- Theories of Unimolecular reaction
  Lindemann's theory – Hinshelwood Theory, Trimolecular reaction, Trautz's Law
- Primary salt effect
- Secondary salt effect Numerical

Books Suggested (Physical Chemistry) :-

1. Advance Physical Chemistry by Gurdeep Raj.
2. Physical Chemistry (Question and Answer) by R. N. Madan, G.D. Tuli, S.Chand.
3. Principal of Physical Chemistry by Puri, Sharma, Pathania.
4. Chemical Thermodynamics by R.P. Rastogi and R.R.Mishra.
5. Physical chemistry by atkins.
6. Essentials of Physical Chemistry by B. S. Bahal, Arun Bahal, G.D.Tuli,
7. Physical Chemistry by P.W. Atkins, 5th edn, Oxford 1994 7th edn-2002.
8. Physical Chemistry by R.A. Albern and R.J.Silby, John Wiley 1995.
9. Physical Chemistry by G.H. Barrow, 5th edn, Mac Graw Hill, 1988,6th edn, 1996.
10. Physical Chemistry by W.J.Moore, 4th edn, Orient Longmans 1969.

INSTRUCTION STRATEGIES

1. Explanation of Principles, protocols, expected result trends, handling of instruments and equipments, precautions and safety measures in class and demonstration of important steps.
2. Monitoring of the students performing the experiments.
3. Evaluation of results of each experiment.

TEACHING AND EXAMINATION

UNIT	Examination Scheme %Weightage	Teaching Scheme No. of Lecture
Unit I	34	15
Unit II	33	15
Unit III	33	15
Total	100	45

KADI SARVA VISHWAVIDYALAYA
B.Sc Semester 6 Syllabus (W.E.F. June 2019)

CCH 604- Analytical Chemistry - III

RATIONALE: This course is designed to enable students to acquire basic understanding of the basic principles of analytical chemistry.

LEARNING OUTCOMES:

- Understand the concept of Analytical sciences.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of Mid Term examinations for 30 marks and End Term Examination conducted by University examination for 70 marks.

Subject Code	Subject Title	Credits	Theory			Total Marks
			Hrs.	Max Marks		
				Mid Term	End Term	
CCH- 604	Analytical Chemistry – III	3	45	30	70	100

COURSE CONTENT

UNIT :- I Raman Spectroscopy
Number of lectures: 15 **Weightage:33%**

- Introduction
- Principle stoke – Anti stoke line
- Instrumentation
- Difference between IR and Raman
- Applications

UNIT- II : NMR spectroscopy
Number of lectures: 15 **Weightage:34%**

- Introduction
- Proton magnetic resonance (1H NMR) spectroscopy Equivalent and non equivalent protons
- Nuclear shielding & de-shielding
- Chemical shift & molecular structure
- Spin-spin splitting and coupling constant Area of signals
- Interpretations of PMR spectra
- Simple organic molecule such as ;

(1) Ethyl bromide (2) Ethanol (3) Acetaldehyde (4) 1,1,2-Try bromo ethane (5) Ethyl acetate (6) Toluene (7) Acetophenone (8) Iso propyl Benzene (9) Acetic acid (10) Phenetol

UNIT :- III : IR spectra & Numericals based on UV, IR and NMR Spectra
Number of lectures: 15 **Weightage:33%**

(A) Infrared spectroscopy.

- Introduction
- Molecular vibrations (Fundamental vibrations of AX_2 type molecules) Characteristics of IR spectroscopy
- Sample techniques Fingerprint zone
- Effect of IR in geometrical isomerism IR spectra & H-bonding
- Factor affecting on >C=O group frequencies
- Differentiate two compounds by the IR frequencies.

(B) Problems pertaining to the structure elucidation of organic compounds using UV, IR & NMR spectroscopic techniques (one out of two)

Suggested books: (structural chemistry)

1. Basic principles of spectroscopy by R.Chand
2. Spectrometric identification of organic compounds IVth edition by Silverstain, Bassler and Morrill.
3. Application of absorption spectroscopy of organic compounds by John R. Dyer
4. Spectroscopic method in organic chemistry Vth edition by Dudley H. Williams & Ian Fleming
5. Organic spectroscopy by Williams & Kemp
6. Organic spectroscopy by V.R.Dani
7. Fundamentals of Analytical Chemistry D.A.Skoog, D.M. West & F.J.Holler
8. Principles of Analytical Chemistry J.H. Kennedy
9. Analytical Chemistry – Principals & Techniques L.G.Hargis
10. Organic Structural Spectroscopy- J.B. Lambert, H.F. Shurvell, D.A. Lightner, R.G. Cooks, Prentice Hall, New Jersey, USA, 1998.

INSTRUCTION STRATEGIES

1. Explanation of Principles, protocols, expected result trends, handling of instruments and equipments, precautions and safety measures in class and demonstration of important steps.
2. Monitoring of the students performing the experiments.
3. Evaluation of results of each experiment.

TEACHING AND EXAMINATION

UNIT	Examination Scheme %Weightage	Teaching Scheme No. of Lecture
Unit 1	33	15
Unit 2	34	15
Unit 3	33	15
Total	100	45

KADI SARVA VISHWAVIDYALAYA
B.Sc Semester 6 Syllabus (W.E.F. June 2019)

FCG 601-Basic English – VI

RATIONALE: This course is designed toenable students to acquire basic understandingof English grammar. The course would help students to fortify their knowledgeofEnglishandstrengthentheirbasiccommunicationabilities.

LEARNING OUTCOMES:

- Understandthefunctionsandusageofsentenceframing,sentencecorrecti onand synthesis thesentences
- Develop language skills of reading through filling in appropriate words in blanks,correctingerrors,choosingcorrectforms,etc.
- AcquireinterestinEnglishlanguageandliteraturethroughtextbooklessons.
- Acquire writing skill through developingstory.
- Acquirethespeakingskillthroughspeeches.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measuretheperformanceofstudents,butalsotomotivatethemforbetterperform ance. Students are evaluated on the basis of Mid Term examinations for 15 marks and End Term ExaminationconductedbyUniversityexaminationfor35marks.

Subject Code	Subject Title	Credits	Theory			Total Marks
			Hrs.	Max Marks		
				Mid Term	End Term	
FCG - 602	Basic English – VI	2	24	15	35	50

Unit 1: Numberoflectures:8 Weightage 33%

Lesson2:*BetweentheMosque*
Lession7:*MyFinancialCareer*
Lession8:*SpeechonIndianIndependence* Poem14:*TheWorldisTooMuchwithus* Poem 15 :*Success is Counted Sweetest* Poem16: *I,Too,SingAmerica*
TheJoyofReadingselectedProse&Poetry

Unit 2: Grammar Numberoflectures: 4 Weightage 17% - Transformation,Correction(prepositions,Tenses,Concord) - Synthesis ofSentences - Avoiding Common errors in English Grammar	
Unit 3: Numberoflectures:8 Weightage 33% • Questionnaire (on current Issues i.e.Social, political, Educational) • Components of Questionnaire	
Unit 4 Preparing Speeches Numberoflectures:4 Weightage 17% - Introducing ChiefGuest - FarwellSpeech - Speech on annualfunctions - MourningtheDeathofVIP - Speech on RepublicDay	

REFERENCES

1. HighSchoolEnglishGrammar–Wrenn&Martin
2. ContemporaryEnglishGrammar–DavidGreen

INSTRUCTION STRATEGIES

1. Interactionswiththestudentstounderstandthelevelofstudents
2. Explaining&discussingEnglishlanguagestructures.
3. Teachingthetopicsincludedinthesyllabuswiththehelpofteachingaidslike OHP, LCD(Powerpointpresentation),Notes,QuestionBanks,ReferencesandRe prints/ Copy of Articles, Models,Diagrams
4. Assistanceinsolvingofquestionsfromourquestionbank.

TEACHING AND EXAMINATION

UNIT	Examination Scheme	Teaching Scheme
Unit 1	33	8
Unit 2	17	4
Unit 3	33	8
Unit 4	17	4
Total	**100**	**24**

KADI SARVA VISHWAVIDYALAYA
B.Sc Semester 6 Syllabus (W.E.F. June 2019)

EGC 601- Personality Development & Interview Skills

RATIONALE: This course is designed to enable students to acquire basic understanding of the components of professional communication, the skills required for the same and practice them.

LEARNING OUTCOMES:

- To build confidence for communicating in English and create interest for the life-long learning of English language
- To describe and characterize spoken English both from the grammatical and the discourse perspectives.
- To draw comparisons between oral and written language through the use of representative oral and written language.

TEACHING AND EVALUATION SCHEME:

The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of Mid Term examinations for 15 marks and End Term Examination conducted by University examination for 35marks.

Subject Code	Subject Title	Credits	Theory			Total Marks
			Hrs.	Max Marks		
				Mid Term	End Term	
EGC- 601	Personality Development & Interview Skills	2	24	50	--	50

COURSE CONTENT

Unit – I Self Development and Communication: **Number of lectures: 12**
Weightage: 50%

(a) Professional Etiquettes
(b) Goal Setting
(c) Time Management
(d) Stress Management

Unit – IIA.Writing Skills	**Number of lectures: 06**	**Weightage: 25%**
(a) Resume writing (Application Que) (b) Report Writing (Application Que) (c) E-mail etiquettes		
Unit II B. Interview Skills		**Weightage: 25%**
(a) Types of Interview (b) Preparation of an Interview (c) Effective guidelines for an interview		

RECOMMENDED READING:

1. V. Sasikumar : A Course in Listening and Speaking – I, Cambridge Uni. Press
2. G. Taylor:English Conversation Practice, Tata Mcgraw-Hill Publishing Co. Ltd.
3. Wrenn&Martin:High School English Grammar & Composition, S, Chand Pub.
4. Kumar S and Lata P Communication Skills 2011: New Delhi Oxford University Press

INSTRUCTION STRATEGIES

1. Interactions with the students to understand the level of students.
2. Explaining & discussing English language structures.
3. Teaching the topics included in the syllabus with the help of teaching aids like OHP, LCD (Power point presentation), Notes, References, Copy of Articles, Models, diagram

TEACHING AND EXAMINATION

UNIT	Examination Scheme %Weightage	Teaching Scheme No. of Lecture
Unit 1	50	12
Unit 2	50	12
Total	100	24

SE CH 601-A Dyeing & Printing of Dyes

Subject Code	Subject Title	Credits		Theory/Practical		Total Marks
		Theory	Practical	Hrs.	Max Marks / End Term (Practical)	
SE CH 601-A	Dyeing & Printing of Dyes	1	1	36	50	50

RATIONALE: This course is designed to enable students to acquire basic understanding of dyeing and printing of dyes.

LEARNING OUTCOMES:

- Understand the concept of various dyeing processes.
- Develop an understanding of the dyeing systems around us.
- Gain knowledge about the structure, function and applications of various printing processes of different class of dyes.

COURSE CONTENT

THEORY: Dyeing & Printing of Dyes
Number of lectures: 12
Weightage: 50%

- **Introduction to printing** General sequence of printing; Printing ingredients: thickeners, dyes, hygroscopic agents, reducing and oxidizing agents, etc. Different styles of printing: direct, discharge, resist, brasso, raised etc. Various methods of printing: flat-bed, screen printing, rotary screen printing, roller printing, block printing, stencil printing, transfer printing, etc
- **Printing of Different Dyes** fabrics on Polyester/cotton, polyester/wool, cotton/viscose, polyester/viscose, etc. using suitable combination of dyes and style of printing

PRACTICALS
Number of hours: 24

Dyeing & Printing of Different Synthetic Dyes

- Dyeing on Different Textile Fibers
- Printing on Different Textile Fibers
- Dyeing of Congo Red, Eosin, Methyl Orange
- Printing on Alizarin Different Dyes Intermediate
- Cloth Dyeing on Different Clothes and Yarn.
- Beam Dyeing on Cotton, Wool and Nylon fabrics

REFERENCES:

1.Synthetic organic chemistry by O.P. Agrawal
2. The chemistry of synthetic dyes and pigments by H. A. Lubes
3. Chemistry of synthetic dyes VOL I to VII by K. Venkatraman
4.An introduction to synthetic dyes by D. W. Ranghekar& P. P. Singh
5. A hand book of synthetic dyes and their application by C. T. Bhastana& V. H. Raichura& others
6. Dyes stuff chemistry by Guru deep Chattwal
7.Synthetic Practical organic chemistry by O.P. Agrawal
8. Synthetic Practical Organic by A I Vogel
9. Fabrics Dyeing & Printing on Textile fibers by June Fish
10. Printing Technics on Textile fibers by Janet Admonds
11. Practicals of Organic Chemistry of Dyes and Pigments by Dr. P N Dave

TEACHING AND EXAMINATION

UNIT	Examination Scheme %Weightage	Teaching Scheme No. of Lecture
Unit 1	00	12
Unit 2	100	24
Total	100	36

SE CH 601-B Bio-Polymers

Subject Code	Subject Title	Credits		Theory/Practical		Total Marks
		Theory	Practical	Hrs.	Max Marks / End Term (Practical)	
SE CH 601-B	Bio-Polymers	1	1	36	50	50

RATIONALE: This course is designed to enable students to acquire basic understanding of bio-polymers.

LEARNING OUTCOMES:

- Understand the concept of various biological processes.
- Develop an understanding of the polymer systems around us.
- Gain knowledge about the structure, function and applications of various biological processes of different class of polymers.

COURSE CONTENT

Number of lectures: 12 **Weightage: 50%**

THEORY :

- Basic idea of polymers used as adhesive and coatings.
- Liquid crystalline polymers.
- Conducting polymers.
- Biopolymers, biodegradable polymers.
- Polymer for engineering and biomedical applications.
- Pollution due to polymers

PRACTICALS **Number of hours: 24**

Synthesis of Resins

- Epoxy
- Ion exchange
- Urea formaldehyde
- Polyester

Synthesis of Phenolic Resols

- Phenol
- Menthol
- Resorcinol based resols

REFERENCES:

1.	F.W. Billmeyar, A text book of polymer science, John Wiley & Sons, 1971.
2.	V.R. Gowariker, N.V. Viswanathan and Sreedhar, Polymer Science, Wiley Easern Ltd., New Delhi, 1986.
3.	Maurice Morten, Rubber Technology, Van Nostrand, Reinold, New York.
4.	S. Paul, Surface Coatings
5.	B.K. Sharma, Polymer Chemistry, Goel Publishing House, Meerut
6.	M. Jenkins, Biomedical Polymers, University Birmingham, U.K.
7.	Introduction to Polymer Science and Technology, BY Mustafa Akay

TEACHING AND EXAMINATION

UNIT	Examination Scheme %Weightage	Teaching Scheme No. of Lecture
Unit 1	00	12
Unit 2	100	24
Total	100	36

KADI SARVA VISHWAVIDYALAYA
B.Sc Semester 6 Syllabus (W.E.F. June 2019)

SE CH-601C Medicinal Chemistry-IV

Subject Code	Subject Title	Credit		Theory/Practicals		Total Marks
		Theory	Practical	Hrs.	Max Marks End Term (Practical)	
SE CH- 601 C	Medicinal Chemistry-IV	1	1	36	50	50

COURSE CONTENT

Number of lectures: 12 **Weightage: 50%**

THEORY

Combinatorial Chemistry

Introduction, principle, importance of new drug discovery, various synthetic approaches and library Purification.

- **Some medicinally important heterocyclic compounds**

Introduction to heterocyclic compounds, synthesis of some heterocyclic drugs like chloroquine, antipyrine, phenacetin, barbiturates

Number of hours: 24 **PRACTICALS**

Organic preparation of following medicinal agents including TLC monitoring of these synthesized drugs

- Paracetamol
- Aspirin
- Methyl Salicylate
- Diclofenac sodium

REFERENCES:

1. Wilson and Giswold's Textbook of Organic, Medicinal and Pharmaceutical Chemistry,J. N. Delagado and W. A. R. Remers, Eds, J. Lipponcott Co. Philadephia.

2. Principles of Medicinal Chemistry by W. C. Foye,, Lea &Febiger, Philadelphia.

3. Burger's Medicinal Chemistry, H. E. Wolff, Ed. John Wiley & Sons, New York Oxford University Press, Oxford.

4. 'Strategies for Organic Drug Synthesis & Design by Daniel Lednicer, John Wiley & sons, USA.

TEACHING AND EXAMINATION

UNIT	Examination Scheme %Weightage	Teaching Scheme No. of Lecture
Unit 1	00	12
Unit 2	100	24
Total	100	36

PCH 601-Chemistry Practical-VI

RATIONALE: This course is designed to enable students to acquire on hand basic understanding of the chemical world, its origin and structure to help the potential application of the unexplored and unidentified compounds in the industry. These practical make the students capable and competent to work in chemistry related industries.

LEARNING OUTCOMES:

- Understand the concept of origin of chemistry.
- Develop an understanding of the chemical properties of compounds.
- Gain knowledge about the structure, function and applications of the chemicals compounds.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. General viva-voce will be conducted to analyze the knowledge of the student.

Subject Code	Subject Title	Credits	Practical		Total Marks
			Hrs.	Max Marks	
PCH- 601	Chemistry Practical-VI	6	12	200	200

Laboratory Course
PCH - 601
(Inorganic, Organic, Physical Chemistry)
Inorganic Chemistry practical

Qualitative analysis (Minimum 8)

Inorganic mixture should be comprised of six radicals.
Candidate if required should be guided once for the wrong group and marks deducted for wrong group. Maximum of five marks can be deducted for wrong group. There shall be no deduction of marks for reporting wrong radicals

Organic Chemistry practical

(A) Estimation of functional groups: (Minimum 03)

(1) Estimation of Ester
(2) Estimation of Amide
(3) Estimation of Ascorbic acid
(4) Estimation of Aspirin
(5) Estimation of Ketone

(B) – 1 Synthesis of Organic Compounds (Minimum 05)

(1) Preparation of m-Dinitro benzene from Nitrobenzene
(2) Preparation of p-Nitro acetanilide from Acetanilide
(3) Preparation of Acetanilide from Aniline (Green Preparation)
(4) Preparation of Benzilic Acid from Benzil (Green Preparation)
(5) Preparation of Di-benzal acetone from Benzaldehyde

(B)- 2. Chromatography [TLC] (Minimum 02)

Analysis of the following drugs by Thin Layer Chromatography.

(i) Aspirin (ii) Paracetamol (iii) Ibuprofen

Any one for the practical exam Estimation or Chromatography. – 25 Marks

One Preparation – 25 Marks

Physical Chemistry Any Eight

[A] [Instruments]

1. To determine concentration of the given Iodide solution by Potentiometric titration against 0.1N $KMnO_4$ solution.
2. To determine formal redox potential of Fe^{+2}/Fe^{+3} by Potentiometry.
3. To determine the concentration of the **nitrite** in the given solution by Colourimetric estimation method.
4. To determine the concentration of unknown solution from given $K_2Cr_2O_7$ by Colourimetry.
5. To determine the Solubility product and solubility of sparingy soluble salt of $BaSO_4$ by Conductometry.
6. To determine the strength of strong and weak base in a given mixture using a pH meter.

[B] Kinetics, Adsorption & Polymer

1. To study the reaction between $KBrO_3$ and KI at two different temperature and calculate the temperature coefficient and the energy of activation.
2. To study the absorption of Acetic Acid on Charcoal and prove the validity of freundlich equation.
3. To determination of molecular weight of high polymer (i.e. polystyrene) by Viscosity mesasurent.
4. To study the rate constant of the reaction between $K_2S_2O_8$ and KI and study the influence of ionic strength on the rate constant
5. Determination of viscosity of pure liquids A and B, and their different percentage compositions and determination of composition of unknown mixture of A and B.
6. Study of inversion of sucrose in presence of 1N HCl and determination of the order of the reaction by polarimeter.

7. Calculate entropy of vaporization (ΔSv) of a given liquid by plotting a graph of log (1/time) vs (1/temperature) **8.** To determine the heat of solution of an organic solvent (n-HEXANE, ISOPROPYLE ALCOHOLE, CYCLOHAXANE)

INSTRUCTION STRATEGIES

1. Explanation of Principles, protocols, expected result trends, handling of instruments and equipments, precautions and safety measures in class and demonstration of important steps.
2. Monitoring of the students performing the experiments.
3. Evaluation of results of each experiment.

PRACTICAL EXAMINATION PATTERN FOR CHEMISTRY: PCH 601

Pattern of University Practical Exam (2 days)

Time: 10:00am to 5:00pm (Including 30 minutes recess) Total Marks: 200

First Day

(A) Inorganic (50 marks)
- Inorganic Qualitative Mixture

(B) Organic (50 marks)
- Estimation (25 Marks) & Preparation (25 Marks)

Second Day

(C)Physical (50 marks)
- Any one exercise should be selected for each candidate from syllabus.

(D) Viva-Voce and Journal

Viva-Voce on practical base (40 marks)

- Inorganic ……13 marks
- Organic ……..13 marks
- Physical ……..14 marks

Journal (10 marks)

Note: Without Certified practical record a student will not be permitted toappear at practical examination

KADI SARVA VISHWAVIDYALAYA
B.Sc Semester 6 Syllabus (W.E.F. June 2019)

EXAMINATION PATTERN

KADI SARVA VISHWAVIDYALAYA, GANDHINAGAR

B.Sc. Chemistry, Semester V/VI, End Term Examination,

Month-Year

Subject: Code-Title

Time: 3 hrs **Date** **Maximum marks: 70**

Que. No : 1	(A) : Write any Two out of Three Questions (B) : Write any One out of Two Questions	12 Marks 08 Marks
Que. No : 2	(A) : Write any Two out of Three Questions (B) : Write any One out of Two Questions	12 Marks 08 Marks
Que. No : 3	(A) : Write any Two out of Three Questions (B) : Write any One out of Two Questions	12 Marks 08 Marks
Que. No : 4	Write any Ten out of Twelve (Four questions to be asked from each unit) Short question/MCQ/Short numerical/Diagram/Match the following	10 Marks
Total marks		70 marks