JAYARAJ ANNAPACKIAM COLLEGE FOR WOMEN (AUTONOMOUS)

A Unit of the Sisters of St. Anne of Tiruchirappalli

Accredited with 'A' Grade (3rd Cycle) by NAAC

DST - FIST Supported College Since 2015

(Affiliated to Mother Teresa Women's University, Kodaikanal)

PERIYAKULAM – 625 601, THENI DT.
TAMIL NADU.

B.SC. CHEMISTRY
2017 - 2020

DEPARTMENT OF CHEMISTRY

PROGRAMME OUTCOMES - U.G.

PO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO
1.	Think critically, evaluate analytically and apply the acquired knowledge of their discipline in related scenario.
2.	Formulate hypothesis, design experiments, use appropriate tools and interpret the results.
3.	Demonstrate the precise understanding of the principles and theories of their discipline through experiments.
4.	Enhance the communicative skills and gain confidence to disseminate knowledge through oral/verbal communications effectively at various situations.
5.	Identify the different roles in an organizational structure of the work place and carry out multiple roles in social responsibilities.
6.	Increase self-awareness, set and pursue meaningful goals, and develop positive personal qualities such as self-esteem, positive attitude, self-discipline, and self-motivation.

PROGRAMME SPECIFIC OUTCOMES - U.G.

PSO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO	PO MAPPED
1.	Fix their feet and brighten their career in the field of chemistry for sustainable future and face emerging opportunities and challenges.	PO - 1 PO - 4
2.	Apply knowledge in various aspects of chemistry in fields such as organic, inorganic, physical, analytical, spectral, biochemical and environment.	PO - 1 PO - 2
3.	Exhibit problem solving skills and analytical skills.	PO-3
4.	Realize the values of chemistry in our daily life and discharge knowledge and skills as analyst in small scale industries, cottage industries, quality control sectors.	PO - 5 PO - 6
5.	Pursue higher education in the field of chemistry and interdisciplinary courses.	PO - 5

U.G. COURSE PATTERN (2017 - 2020)

Sem.	Part	Code	Title of The Paper	Hours	Credits
I	I	17GT1GS01/ 17GH1GS01	Tamil – I/ Hindi	5	3
	II	17GE1GSA1/ 17GE1GSB1	English - I	5	3
	III	17CH1MC01	General Chemistry - I	4	4
	III	17CH1MC02	General Chemistry - II	4	4
	III	17CH1CP01	Practical: Inorganic Qualitative Analysis*	3	-
	III	17MA1AC01/ 17ZO1AC01	Allied Mathematics - I / Allied Zoology - I	5 3	4 3
		17ZO1AP01	Allied Zoology - I Lab	2	1
	IV	17VE1GS01	Value Education	2	2
	IV	17AE1SK01	SBE - I Communication Skills	2	2
			Total	**30**	**22**
II	I	17GT2GS02/ 17GH2GS02	Tamil-II/ Hindi	5	3
	II	17GE2GSA2/ 17GE2GSB2	English - II	6	3
	III	17CH2MC03	General Chemistry - III	5	3
	III	17CH2MC04	General Chemistry - IV	4	2
	III	17CH2CP01	Practical: Inorganic Qualitative Analysis	3	3
	III	17MA2AC02/ 17ZO2AC02	Allied Mathematics - II/ Allied Zoology - II	5 3	4 3
	III	17ZO2AP02	Allied Zoology - II Lab	2	1
	IV	17CH2SK02	SBE - II Everyday Chemistry	2	2
			Total	**30**	**20**
III	I	17GT3GS03/ 17GH3GS03	Tamil-III/ Hindi	5	3
	II	17GE3GSA3/ 17GE3GSB3	English - III	6	3
	III	17CH3MC05	Organic Chemistry - I	3	3
		17CH3MC06	Physical Chemistry - I	4	3
	III	17CH3CP02	Practical: Organic analysis	3	2
	III	17PH3AC01	Allied Physics - Theory	3	3
		17PH3AP01	Allied Physics - Lab	2	1
	IV	17ES3GS01	Environmental Studies	2	2
	IV	17AE3SK03	SBE - III Office Automation	2	2
			Total	**30**	**22**

Sem.	Part	Code	Title of The Paper	Hours	Credits
IV	I	17GT4GS04/ 17GH4GS04	Tamil-IV/ Hindi	5	4
	II	17GE4GSA4/ 17GE4GSB4	English - IV	6	4
	III	17CH4MC07	Inorganic and Physical Chemistry	5	4
	III	17CH4CP03	Practical: Volumetric Analysis	3	2
	III	17PH4AC02	Allied Physics - Theory	3	3
		17PH4AP02	Allied Physics - Lab	2	1
	III	17CH4CE1A/	Bio inorganic Chemistry/	4	3
		17CH4CE1B	Bio and Pharmaceutical Chemistry		
	IV	17CH4SK04	SBE - IV Food Chemistry	2	2
			Total	**30**	**23**
V	III	17CH5MC08	Organic Chemistry - II	6	5
	III	17CH5MC09	Physical Chemistry - II	6	6
	III	17CH5MC10	Inorganic Chemistry	6	6
	III	17CH5CP04	Practical: Physical Chemistry	6	3
	III	17CH5CE2A/ 17CH5CE2B/ 17CH5CE2C/ 17CH5CE2D	C-Programming and its applications to Chemistry/ Industrial Chemistry/ Dairy Chemistry/ Green Chemistry	4	3
	IV	17AE5NE01/ 17NC5NE01	NME - I Aptitude Building - I/ Organization and Health Programme in NCC	2	2
			Total	**30**	**25**
VI	III	17CH6MC11	Organic Chemistry - III	6	6
		17CH6MC12	Physical Chemistry - III	6	6
		17CH6MC13	Inorganic and Analytical Chemistry	6	5
		17CH6CP05	Practical: Gravimetric Estimation and Inorganic Preparation	6	3
		17CH6CE3A/ 17CH6CE3B/ 17CH6CE3C/ 17CH6CE3D	Spectroscopy and its Applications/ Nano Chemistry/ Fuel Chemistry/ Soil and Agriculture Chemistry	4	3
	IV	17AE6NE02/ 17NC6NE02	NME - II Aptitude Building - II/ National Integration and Personality Development	2	2
		17CH6SS01	Chemistry in Daily Life	-	2**
			Total	**30**	**25**
I-IV	V	17NP4GS01	NSS/NCC/P.Ed.	--	1
IV-V		17EX5GS01	Extension	--	2
Total for all Semesters				**180**	**140+2****

***** Practical exam only at the End of Semester - II and Credits will be awarded at the End of Semester - II

**** Extra Credit**

ALLIED COURSES OFFERED BY THE DEPARTMENT

FOR I B.Sc. ZOOLOGY (R+SF)

Sem.	Part	Code	Title of the Paper	Hours	Credit
I	III	17CH1AC01	Allied Chemistry - I	3	3
	III	17CH1AP01	Allied Practical I: Volumetric Analysis	2	1
II	III	17CH2AC02	Allied Chemistry - II	3	3
	III	17CH2AP02	Allied Practical II: Organic Analysis	2	1

FOR II B.Sc. PHYSICS (R+SF)

Sem.	Part	Code	Title of the Paper	Hours	Credit
III	III	17CH3AC01	Allied: General Chemistry - I	3	3
	III	17CH3AP01	Allied Practical I: Organic Analysis	2	1
IV	III	17CH4AC02	Allied: General Chemistry - II	3	3
	III	17CH4AP02	Allied Practical II: Volumetric Analysis	2	1

QUESTION PATTERN

For B.Sc. Chemistry and Allied Chemistry for I B.Sc. Zoology & II B.Sc. Physics

Blue print of question paper (External)

Time 3 hours **Max. Marks: 60**

Section	Types of Question	Number of Qns.	Number of Qns. to be answered	Marks for each Qn.	Total
A Q.No (1-10)	Two qns. from each unit - MCQ	10	10	1	**10**
B Q.No (11-15)	Five either or qn. - one from each unit	5	5	4	**20**
C Q.No (16-20)	Open choice - One from each unit	5	3	10	**30**

PART - I Tamil - தற்கால இலக்கியம்

பருவம்: ஒன்று **நேரம்: 5**

குறியீடு: 17GT1GS01 **புள்ளி: 3**

நோக்கம்:

- ❖ தற்கால இலக்கியக் கவிஞர்களைப் பற்றி அறிந்து கொள்வர்.
- ❖ இலக்கிய வரலாற்றை அறிந்து கொள்வர்
- ❖ வாழ்க்கையில் ஏற்படும் துன்பங்களை அகற்றி, வெற்றி பெறும் வழிமுறைகளைத் தெரிந்து கொள்வர்.
- ❖ கட்டுரைகள் வழி பன்முகத் தகவல்களை அறிந்து கொள்வர்.
- ❖ எழுத்து இலக்கணங்களை அறிந்து கொள்வர்.

அலகு 1: மரபுக் கவிதை

1. பாரதியார் - செந்தமிழ் நாடு
2. பாரதிதாசன் - வாழ்வில் உயர்வு கொள்!
3. குவிமணி - ஒற்றுமையே உயிர் நிலை
4. நாமக்கல் கவிஞர் - தேறிய தெளிவு

அலகு 2: புதுக்கவிதை

1. நா.காமராசன் - கடல்
2. வைரமுத்து - நம்பிக்கை ஊன்றி நட
3. சிற்பி - மூல ஒலி
4. கோவை பழநிசாமி - பெண்மையே...

அலகு 3: உரைநடை

1. டாக்டர்.எம்.எஸ். உதயமூர்த்தி - வெற்றிக்கு முதல்படி

அலகு 4: கட்டுரைகள்

1. கண்டேன் கொள்ளிப் பிசாசை-பிலோ இருதயநாத்
2. சுய முன்னேற்றக் கட்டுரை-துளைகளில்லாப் புல்லாங்குழல்-வெ.இறையன்பு
3. அறிவியல் கட்டுரை-மருந்துகளிடம் எச்சரிக்கைமுனைவர் க. பூரணச்சந்திரன் (தொகுப்பாசிரியர்)
4. வரலாற்றுக் கட்டுரை-உழுதொழில் (ந.மு.வேங்கடசாமி நாட்டார்)
5. இலக்கியக் கட்டுரை-பாரதியார் போற்றும் புதுமைப் பெண் (நிர்மலா மோகன்)

அலகு 5: இலக்கணம், இலக்கிய வரலாறு

1. இலக்கணம்: - எழுத்தும், சொல்லும்

   எழுத்து - முதலெழுத்து, சார்பெழுத்து

   சொல் - பெயர்ச்சொல், வினைச்சொல், இடைச்சொல், உரிச்சொல்

2. எம். ஆர். அடைக்கலச்சாமி - இலக்கிய வரலாறு:

   (தற்கால இலக்கியம், மரபுக்கவிதை, புதுக்கவிதை, உரைநடை தொடர்பான இலக்கிய வரலாறு)

பாடநூல்கள்:

1. தொகுப்பாசிரியர் கவிஞர் பத்மதேவன் - ‘பாரதியார் கவிதைகள் ‘
காளீஸ்வரி பதிப்பகம் சென்னை - 17
இரண்டாம் பதிப்பு 2009.

2. தொகுப்பு: கீர்த்தி - ‘பாரதிதாசன் கவிதைகள்’
அருணா பப்ளிகேஷன்ஸ் சென்னை
முதல் பதிப்பு -2008.

3. கவிமணி - மலரும் மாலையும்
பூம்புகார் பதிப்பகம்,சென்னை.முதல்
பதிப்பு, 2002.

4. நாமக்கல் கவிஞர் - தமிழன் இதயம் கவிதைகள்’
முல்லை நிலையம்
சென்னை முதல் பதிப்பு - 2000

5. நா.காமராசன் - கருப்பு மலர்கள்,திருமகள் நிலையம்,
வெங்கட நாராயணா சாலை
தி.நகர்,சென்னை - 600 017
முதல் பதிப்பு - ஏப்ரல் - 1971

6. வைரமுத்து கவிதைகள் - ‘திருமகள் நிலையம்’,
16, வெங்கட்நாராயணா சாலை,
சென்னை - 17.
பத்தாம் பதிப்பு - 2009.

7. சிற்பி - சிற்பி கவிதைகள்
நியூ செஞ்சுரி புக் ஹவுஸ்
சென்னை. முதல் பதிப்பு - 2011.

8. கோவை பழநிசாமி - விளக்குகள் எரியாத வீதி
மனோண்மணி பதிப்பகம்,கோவை.
முதல் பதிப்பு - 2006

9. டாக்டர்.எம்.எஸ.உதயமூர்த்தி - வெற்றிக்கு முதல்படி
கங்கை புத்தக நிலையம்
சென்னை - 600041
முதல் பதிப்பு - 1993

10. வெ. இறையன்பு - ‘உள்ளொளிப் பயணம்’
நியூசெஞ்சுரி புக் ஹவுஸ்
சென்னை - 98
மூன்றாம் பதிப்பு - 2007

11. பூரணச்சந்திரன் - அறிவியல் கட்டுரைகள்
அறிவுப் பதிப்பகம்,சென்னை-600014
முதல் பதிப்பு - 2006

12. ந.மு.வேங்கடசாமிநாட்டார் - நாவலர் நாட்டார் தமிழ் உரைகள்
தமிழ் மண் பரிப்பகம், சென்னை-600017
முதல் பதிப்பு - 2007

13. முனைவர். நிர்மலா மோகன் - ‘இலக்கிய மலர்கள்’
மீனாட்சி புத்தக நிலையம், மதுரை - 1
முதல் பதிப்பு - 2004.

14. எம். ஆர். அடைக்கலச்சாமி - ‘இலக்கிய வரலாறு’
ராசி பதிப்பகம், சென்னை - 73.
41ஆம் பதிப்பு - 2011.

LANGUAGE THROUGH LITERATURE- I

STREAM -A

Semester: I **Hours: 5**

Code : 17GE1GSA1 **Credits: 3**

COURSE OUTCOMES:

- Develop and integrate the use of four language skills i.e. Reading, Listening, Speaking and Writing
- Analyze and interpret texts written in English, evaluating and assessing the results in written or oral arguments using appropriate support.
- Develop critical thinking capabilities.
- Become proficient in English for global competency.
- Improve and extend the communication strategies in the language.

UNIT I: PROSE

2hours

How to be a Doctor	-	Stephen Leacock
Fifteen Years	-	R.K.Narayan

UNIT II: POETRY **1 hour**

The Lotus	-	Toru Dutt
Solitude	-	Alexander Pope
Mending Wall	-	Robert Frost

UNIT III: SHORT STORY **1 hour**

The Model Millionaire	-	Oscar Wilde
Mrs. Packletide's Tiger	-	Saki

UNIT IV: ONE ACT PLAYS

Monkey's Paws	-	W.W.Jacobs

UNIT V: COMPOSITION AND GRAMMAR **1 hour**

One Word Substitutes

Foreign Words and Phrases

Jumbled Sentences

Reading Comprehension

Tenses, Articles.

COURSE BOOK:

- 'Limelight-1', SSK Publishers and Distributors, Chennai, 2016
- Savarimuttu,J.S Rohan, and Petricia Alphine Nirmala. *English Grammar and usage –An ideal Companion For Advanced Learners .* Chennai: New Century Book House (P) Ltd, 2016.Print.

LANGUAGE THROUGH LITERATURE - I - 17GE1GSA1

QUESTION PATTERN

STREAM – A

Time: 3 hours		**Marks: 60**
I.	Choose the best answer (from units I & II)	10x1=10
II.	Answer any two of the following in a paragraph of 100 words each (two out of 4 from units I & II)	2x5=10
III.	Answer any two of the following in an essay of 300 words each (two out of 4 from units I, II, III & IV)	2x10=20
IV.	Rearrange the jumbled sentences (from Unit V)	5
V.	Give one word substitutes / foreign words for the following (from Unit V from the prescribed book)	5
VI.	Read the passage and answer the following questions. (from Unit V)	5
VII.	Fill in the blanks with suitable tenses and articles (from Unit V)	5

LANGUAGE THROUGH LITERATURE-I

STREAM – B

Semester: I **Hours: 5**

Code : 17GE1GSB1 **Credits: 3**

COURSE OUTCOMES

- Get exposed to a range of contexts where the language is used to meet a variety of real life communication needs.
- Learn good English to prosper in professional and personal lives
- Become proficient in English for global competency
- Enhance language through a task- based and learner- centric syllabus
- Carry out all the LSRW skills

UNIT I: PROSE 1 hour

Stephen Leacock	-	With the Photographer
Catherine Lim	-	Eggs
M.K.Gandhi	-	Voluntary Poverty

UNIT II: POETRY 1 hour

Alfred Noyes	-	The Highway Man
William Wordsworth	-	The Solitary Reaper
W.B.Yeats	-	The Ballad of Father Gilligan

UNIT III: SHORT STORY 1 hour

Guy de Maupassant	-	Simon's Papa
Lafcadio Hearn	-	The Living God

UNIT IV: COMMUNICATIVE EXPRESSIONS 1 hour

Greeting

Introducing

Seeking Permission

Expressing Gratitude

UNIT V: GRAMMAR & COMPOSITION 1 hour

Parts of speech (P.No. 1to6)

Articles (P.No. 67-71)

Letter Writing (Leave Application & Letter of Complaints)

BOOKS FOR REFERENCE:

- Savarimuttu,J.S Rohan, and Petricia Alphine Nirmala. *English Grammar and usage – An ideal Companion For Advanced Learners .* Chennai: New Century Book House (P) Ltd, 2016. Print.
- G.Radhakrisna Pillai, and K.Rajeevan. *Spoken English forYou.* Chennai: Emerald Publishers, 2012. Print.

LANGUAGE THROUGH LITERATURE – I – 17GE1GSB1

QUESTION PATTERN

Stream – B

Time: 3 hours **Marks : 60**

I.	Choose the best Answer (from units I & II)	10x1=10
II.	Answer any two of the following in a paragraph of 100 words each (two out of four from units I, II & III)	2x5=10
III.	Answer any two of the following in an essay of 300 words each (two out of four from units I, II, & III)	2x10=20
IV.	Matching the expressions. (from unit IV)	5
V.	1. Fill in the blanks. (from unit V -5 marks for identification of Parts of Speech and 5- marks for Articles)	10x1=10
	2. Letter writing (from unit V)	5

GENERAL CHEMISTRY-I

Semester: I **Hours: 4**

Code : 17CH1MC01 **Credits: 4**

COURSE OUTCOMES:

- Describe the structure of atom.
- Discuss the theories substantiate for the atom model and associate the electronic arrangements in atoms and periodic properties.
- Explain the basic concepts of organic chemistry.
- Calculate empirical and molecular formulae from percentage composition and molecular weight.
- Focus the safety measures in laboratory.

UNIT I: STRUCTURE OF ATOM:

Rutherford model of atom - Bohr's model - origin of hydrogen spectrum-Bohr - Sommerfeld theory - dual character of electron-de-Broglie equation - Heisenberg uncertainty principle - related simple problems - Compton effect - quantum numbers - rules for filling up of atomic orbital- Pauli's Exclusion principle- Aufbau principle- Hund's rule- electronic configuration of elements- shapes of s, p and d orbitals -difference between orbit and orbital- Schrödinger wave equation (no derivation) **(12 Hours)**

UNIT II: PERIODIC TABLE:

Modern periodic Law - modern Moseley's periodic table - diagonal relationship - classification and characteristics of s, p, d and f block elements

PERIODIC PROPERTIES:

Definition- gradation in properties - factors affecting covalent radii- ionic radii - ionization potential - electro negativity-electron affinity **(12 Hours)**

UNIT III: INTRODUCTION TO ORGANIC CHEMISTRY:

Classification of organic compounds - saturated and unsaturated compounds - Detection of elements - Lassaigne's test- homologous series - functional groups- IUPAC nomenclature -calculation of the empirical formula- determination of molecular weight by silver salt method and chloro platinic salt method- calculation of molecular formula-structural formula **(12 Hours)**

UNIT IV: ALKANES:

Introduction- general methods of preparation (any three) - general chemical properties: halogenations, nitration, sulphonation, pyrolysis, isomerization, aromatization and combustion

ALKENES:

General methods of preparation including Hoffmann's rule, Saytzeff rule - reaction of alkenes- Markownikoff's rule - peroxide effect -action of heat of sulphuric acid- ozonolysis- alkadienes - classification - Diels Alder reaction - 1,2 and 1,4 addition - Theils theory of partial valency

ALKYNES:

General methods of preparation of alkynes-acidity of alkynes **(12 Hours)**

UNIT V: PRACTICAL GUIDELINES:

Safety rules- first aid- use of LPG in laboratory- precautions- general rules for handling reagents and apparatus-introduction to inorganic qualitative analysis - classification of methods of analysis - advantages of semi- micro analysis - apparatus (test tubes, centrifuge tube, reagent bottle, beaker, stirring rods, droppers, wash bottle, heating block), centrifugation - advantages of centrifugation- cleaning of apparatus **(12 Hours)**

COURSE BOOKS:

1. B.R. Puri, L.R. Sharma and S.Pathania, Principles of Physical Chemistry, Vishal Publishing Co., 46th edition, 2012 **Unit I**
2. B.R. Puri, L.R.Sharma and K.C. Kalia, Principles of Inorganic Chemistry, Milestone Publishers, 31st edition, 2012 **Unit II**
3. M.K. Jain and S.C.Sharma, Modern Organic Chemistry, Vishal Publishing Co., 4th edition, 2013 **Unit III and IV**
4. V. Venkateswaran, R. Veerasamy and A. R. Kulandaivelu, Basic principles of Practical chemistry , Sultan Chand and sons, 2nd edition, 2012, **Unit V**
5. S. Sundaram,P.Krishnan and P.S. Raghavan, Practical Chemistry, S.Viswanathan Pvt. Ltd. 1st edition, 2002, **Unit V**

BOOKS FOR REFERENCE:

1. P.L. Soni and H.M Chawla, Organic Chemistry, Sultan Chand and Sons, 29th edition,
2. K.S.Tewari, N.K. Vishnoi, A COURSE BOOKS of Organic Chemistry, Vikas Publishing House Pvt. Ltd., 3rd edition, 2006
3. Arun Bahl, B.S.Bahl, Advanced Organic Chemistry, S..Chand and company Ltd. 1st edition, 2006
4. R.D.Madan Modern Inorganic Chemistry, S.Chand and company Ltd., 3rd edition, 2012

GENERAL CHEMISTRY-II

Semester: I **Hours: 4**

Code : 17CH1MC02 **Credits: 4**

COURSE OUTCOMES:

- Gain knowledge on the principles of substitution and elimination reaction.
- Describe the different types of chemical bonding.
- Explain the principles of metallurgy.
- Analyze the general principles of isolation of elements.
- Gain the knowledge about various types of titrations and apply for the practicals.

UNIT I: REACTION INTERMEDIATES:

Types of reagents: Nucleophilic reagent- electrophilic reagent- homolytic and heterolytic cleavage of covalent bond - free radicals- carbocations - carbanions - carbenes: formation and their stability- inductive effect-eletromeric effect-resonance - hyperconjugation **(12 Hours)**

UNIT II: TYPES OF REACTIONS:

Substitution-addition- elimination - rearrangement- polymerization - reaction mechanisms of nucleophilic substitution: S_N1 and S_N2 - difference between them - mechanisms of elimination: E_1 and E_2 **(12 Hours)**

UNIT III: CHEMICAL BONDING:

Definition and characteristics of ionic and covalent compounds - hydrogen bonding - definition-types and applications- oxidation and reduction- oxidising agent - reducing agent- oxidation number calculations - redox reactions- galvanic cells-oxidation and reduction potentials **(12 Hours)**

UNIT IV: METALS AND METALLURGY:

Ores - minerals - differences - purification of ores - general methods involved in extraction of metals - concentration- froth floatation-roasting- calcination-chemical reduction - refining: zone refining-Van Arkel-de-Boer process - alloys - definition, examples and uses -coin, brass and bronze **(12 Hours)**

UNIT V: BASICS OF VOLUMETRIC ANALYSIS:

Introduction- terminology in volumetric analysis - concentration terms-preparation of standard solutions - principles of volumetric analysis - classifications of reactions in volumetric analysis- equivalent masses: acid, base, acidic or basic salt, oxidizing and reducing agents - equivalent mass of oxidizing and reducing agents in terms of electronic concept **(12 Hours)**

COURSE BOOKS:

1. M.K.Jain and S.C.Sharma, Modern Organic Chemistry, Vishal Publishing Co., 4th edition, 2013 **Unit I and II**
2. B.R.Puri, L.R.Sharma and K.C. Kalia, Principles of Inorganic Chemistry, Milestone Publishers, 31st edition, 2012 **Unit III and IV**
3. V. Venkateswaran, R. Veerasamy and A. R. Kulandaivelu, Basic principles of practical chemistry , Sultan Chand and sons 2nd edition, 2012 **Unit V**

BOOKS FOR REFERENCE:

1. P.L. Soni and H.M Chawla, Organic Chemistry, Sultan Chand and Sons, 29th edition,
2. K.S.Tewari and N.K.Vishnoi, A COURSE BOOKS of Organic Chemistry, Vikas Publishing house Pvt. Ltd., 3rd edition, 2006.
3. B.R. Puri, L.R. Sharma and S.Pathania, Principles of Physical Chemistry, Vishal Publishing Co., 46th edition, 2012
4. P.L. Soni, M. Katyal, Test book of Inorganic chemistry, Sultan Chand and Sons, 20th edition, 2006
5. Arun Bahl, B.S.Bahl, Advanced Organic Chemistry, S.Chand and company Ltd. 1st edition, 2006.
6. R.D.Madan Modern Inorganic Chemistry, S.Chand and company Ltd., 3rd edition, 2012.

ALLIED MATHEMATICS - I

Semester: I **Hours: 5**

Code : 17MA1AC01 **Credits: 4**

COURSE OUTCOMES:

- Solve the problems in differentiation.
- Evaluate the double integrals by changing the order of integration.
- Acquire the knowledge about fourier series.
- Identify the relation between roots and coefficients of equations.
- Analyze the concepts of transformation of equations.

UNIT I

Successive differentiation - n^{th} derivative - standard results - Leibnitz formula for n^{th} derivative - Jacobians. **(15 Hours)**

UNIT II

Multiple integrals - double integrals - changing the order of integration in double integrals - double integral in polar coordinates. **(15 Hours)**

UNIT III

Fourier series - Fourier coefficients - the cosine and sine series. **(15 Hours)**

UNIT IV

Theory of equations: Relation between roots and coefficients - Reciprocal equations. **(15 Hours)**

UNIT V

Transformation of equations - approximate solutions of numerical equations: Newton's method - Horner's method. **(15 Hours)**

COURSE BOOK:

Course material compiled by the Department.

BOOKS FOR REFERENCE:

1. S. Arumugam and A. Thangapandi Isaac, Ancillary Mathematics Paper I, New Gamma Publishing House, 1996.
2. S. Arumugam and A.Thangapandi Isaac, Ancillary Mathematics Paper III, New Gamma Publishing House, 2002.

ALLIED ZOOLOGY-I (I B.Sc. CHEMISTRY)

INVERTEBRATA, CHORDATA AND CYTOGENETICS

Semester: I **Hours: 3**

Code : 17CH1AC01 **Credits: 3**

COURSE OUTCOMES:

- Acquire knowledge on the characteristic features common to Invertebrates and understand their unique characters.
- Gain knowledge of the salient features of chordates.
- Appreciate the economic importance of insects and fishes.
- Differentiate prokaryotes from eukaryotes and illustrate stages of cell division.
- Acquire knowledge on Inheritance Biology.

UNIT I

Outline classification of animals, Introduction to principles of taxonomy, principles of binomial nomenclature, Grade and level of organization-symmetry, body cavity, salient features of Invertebrata. General characters of phyla with an example each (salient features of amoeba, hydra, ascaris, megascolex, pila, starfish). **(9 Hours)**

UNIT II

Salient features of chordates. General characters of classes with an example each (salient features of balanoglossus, amphioxus, ascidian, shark, frog, calotes, pigeon and rabbit. **(9 Hours)**

UNIT III

Life cycle of plasmodium and its controlling measures, nematode parasites of man, economic importance of insects, economic importance of fishes. Venomous snakes- (Cobra, krait and viper) non venomous snakes) Lycodon, Typhlops)

(9 Hours)

UNIT IV

Difference between prokaryotic and Eukaryotic cells, General structures of animal cells, mitotic cell division, structure and functions of chromosomes, Watson and Crick model of DNA, General features of cancer cells. **(9 Hours)**

UNIT V

Mendelian experiments- monohybrid and dihybrid crosses. Multiple alleles- blood groups in man. Polygenes- skin colour in man, sex determination in man, sex linked inheritance in man. - Down's syndromes, Klinefelter's syndromes and Turner's syndrome. **(9 Hours)**

BOOKS FOR REFERENCE:

1. Kotpal., (1991). Modern textbook of zoology. R. L. Rastogi publication, Meerut.
2. Jordan E. L., and Verma P.S., (1991). Chordate zoology and Animal physiology. Chand and Co., New Delhi.
3. Arumugam N., (1996). A textbook of Chordates. Saras publication, Nagercoil
4. Arumugam N., MuruganS., Johnson J., and Ram Prabu R. (2005) Applied zoology, saras publications, Nagercoil.

ALLIED ZOOLOGY - I LAB

INVERTEBRATA, CHORDATA AND CYTOGENETICS

Semester: I **Hours: 2**

Code : 17CH1AP01 **Credit: 1**

COURSE OUTCOMES:

- Compare the general biology of few Invertebrates and Chordates.
- Dissect the digestive system of cockroach.
- Mount the body setae of earth worm and mouth parts of honey bee.
- Identify the stages of mitosis and analyse Mendelian traits in man.

DISSECTION:

Cockroach- Digestive systema

MOUNTINGS

Body setae of Earth worm

Mouth parts of honey bee

CYTOGENETICS

Observation of Mitosis in onion root tip

Observation of Mendelian traits in man

Monohybrid cross

SPOTTERS

Amoeba, Obelia colony, Ascaris - entire (Male and Female), Prawn- entire, Star fish - Oral and aboral view, Anabas, Naja naja, King fisher, Syndromes - Down's syndrome , Klinefelter's syndrome and Turner syndrome

VALUE EDUCATION

Semester: I **Hours: 2**

Code : 17VE1GS01 **Credit: 2**

COURSE OUTCOMES:

- Develop positive attitude towards life
- Internalize human values and sense one's personal identity and growth
- Face challenges in life positively with a knowledge on life coping skills
- Uphold the dignity of women
- Contribute more for women development and women empowerment

UNIT I

Values in Life- Personal, Social, Values in love and marriage, Spiritual and Professional - Life values - societal concerns and challenges. **(6 Hours)**

UNIT II

Life oriented skills - Self identity - self - esteem, self - concept, self - acceptance - Positive thinking - Positive attitude - Time management **(6 Hours)**

UNIT III

Motivation - Goal setting - Goal, its focus and importance - Success - obstacles to success - overcoming obstacles - Problem solving - Decision making - decision making process. **(6 Hours)**

UNIT IV

Women in society - Sex differences and sexual discrimination in society traditional bases of sexual identity - Actual Difference between the sexes - Social consequences of women's employment in modern society. **(6 Hours)**

UNIT V

Women in the Indian society - Status of women in independent India - problems of women in modern India - Rights and protection given to women by the constitution of India - Strategies for the Protection of women's rights and Rehabilitation of Women - Future Prospects **(6 Hours)**

COURSE BOOK:

- Value Education: Course Material Prepared by the Department of Foundation Courses. JAC

BOOKS FOR REFERENCE:

1. Dr. Xavier Alpphonse S.J., *"We Shall Overcome" - A Text book on Life Coping Skills,* ICRDCE Publication, Chennai, 2011
2. அருள்நிதி ஆ.மு. தாமோதரன் முதுநிலை பேராசிரியர் - இயேசு காட்டும் யோகம். அன்பு நெறி வெளியீடு திண்டுக்கல்.
3. Dennis K. Kelly, ''Achieving Unlimited Success'', Indra Publishing House, Bhopal, 2009
4. Felix Koikara, SDB., ''Live Your Values''-Teacher's Guide, Don Bosco Youth Animation Centre, Ennore, Madras, 1990
5. Elizabeth B. Hurlock, 'Personality Development, TMH Publications, New Delhi, 2004.

CONTINUOUS INTERNAL ASSESSMENT

Components	Marks
Mid Semester	30
End Semester	30
Case Study Report	20
Book/Film Review	20
Total	**100**

QUESTION PATTERN (MID AND END SEMESTER EXAM)

Three essay type questions on any current issues or challenges facing society. [3x10=30]
{Issues and current trends related to women, national importance, societal, environment or value crisis among youth}

PORTIONS FOR INTERNAL TESTS:

I & II Units - Mid Semester

III, IV & V Units - End Semester

COMMUNICATION SKILLS

Semester: I **Hours: 2**

Code : 17AE1SK01 **Credits: 2**

COURSE OUT COMES:

- Develop the four language skills
- Prepare, organize and deliver an effective oral presentation.
- Create suitable situations for role play, debate and group discussion.
- Practice in writing resume and letters.
- Utilize the concept, methodology and components of an Interview

UNIT I - PERSONAL OMMUNICATION

Intra-Personal Communication

Inter-Personal Communication

UNIT II - COMMUNICATION IN AN EDUCATIONAL ENVIRONMENT

Letter Writing

Situational Conversations

Group Discussion

UNIT III - COMMUNICATION FOR CAREER

Facing Interviews

Team Work

UNIT IV- COMMUNICATION IN A GATHERING

Presentation Skills

UNIT V - PUBLIC SPEECH

Welcome Speech

Vote of Thanks

Felicitations

Feedback

COMMUNICATION SKILLS -17AE1SK01

QUESTION PATTERN

Time: 1 Hour **Marks: 30**

I.	Write short notes on any two of the following (From Unit - I, III & IV)	2x5=10
II.	Letter Writing. (From Unit-II)	1x5=5
III.	Situational Conversation/Group Discussion. (From Unit - II)	1x5=5
IV.	Welcome Speech/Vote of Thanks. (From Unit - V)	1x5=5
V.	Felicitations/Feedback. (From Unit - V)	1x5=5

PART - I Tamil

இடைக்கால இலக்கியம்

பருவம்: இரண்டு **நேரம் : 5**

குறியீடு: 17GT2GS02 **புள்ளி : 3**

நோக்கம்:

- ❖ சைவ, வைணவ அடியார்களின் பக்தியைப் பற்றி அறிந்து கொள்வர்.
- ❖ அடியார்களின் வழி இறைவனின் அருள் தன்மையைப் புரிந்து கொள்வர்.
- ❖ செய்யுள் எழுதும் முறையைக் கற்றுக் கொள்வர்.
- ❖ வெற்றிச்சிறப்பைப் போற்றும் முறையைத் தெரிந்து கொள்வர்.
- ❖ செய்யுள் வழி உரைநடையையும், புதின மரபையும் கற்றுக் கொள்வர்.

அலகு 1: சைவம்

1. திருஞானசம்பந்தர் - திருமாகறல்

1. காலையொடுதுந்துபிகள் ...
2. துஞ்சுநறு நீலமிருள்...

2. திருநாவுக்கரசர் - திருக்கொண்டீச்சரம்

1. வரைகிலேன் புலன்கள் ...
2. தொண்டனேன் பிறந்து ...

3. சுந்தரர் - திருக்காளத்தி

1. நீறார் மேனியனே...
2. தளிர் போல் மெல்லடியாள்...

4. மாணிக்கவாசகர் - திருவாசகம்

குயிற் பத்து

அலகு 2: வைணவம்:

1. மதுரகவியாழ்வார்- 'கண்ணினுண் சிறுத்தாம்பு' - 10 பாசுரங்கள்
2. குலசேகர ஆழ்வார் - பெருமாள் திருமொழி
   வித்துவக்கோட்டு அம்மானையே வேண்டி நிற்றல் (688 முதல் 697 வரை)

அலகு 3: சிற்றிலக்கியங்கள்

1. கலிங்கத்துப்பரணி - போர் பாடியது

1. அலைகடல் போல கிளம்பின படைகள். பா.எண். 405 - 407
2. தம் நிழலைக் கண்டு தாமே பயந்து ஓடினர். பா.எண். 451 - 455
3. கலிங்கம் வென்றான் கருணாகரன். பா.எண். 469 - 472

2. நந்திக் கலம்பகம்

1. முரசு அழைக்கிறது. பா.எண்.9
2. களிறைக் கண்டனர் கண்டபடி எண்ணினர். பா.எண். 18 - 20
3. புருவமேறினால் புவியே பணியும். பா.எண். 30

அலகு 4: நாவல்

சொப்பன பூமியில் - திலகவதி

அலகு 5:

இலக்கணம்: யாப்பின் உறுப்புக்கள்

இலக்கிய வரலாறு - பக்தி இலக்கியம், சிற்றிலக்கியம் தொடர்பான பகுதிகள்

நாவலின் தோற்றமும் வளர்ச்சியும்.

பாடநூல்கள்:

1. தமிழ்த்துறை வெளியீடு - இடைக்கால இலக்கியம்,
   ஜெயராஜ் அன்னபாக்கியம் மகளிர் கல்லூரி, பெரியகுளம்
2. எம்.ஆர்.அடைக்கலசாமி - தமிழ் இலக்கிய வரலாறு, ராசி பதிப்பகம்,
   சென்னை - 73, 41 ஆம் பதிப்பு.
3. திலகவதி - சொப்பன பூமியில் , அம்ருதா பதிப்பகம், சக்தி நகர்,
   போரூர், சென்னை - 116, மூன்றாம் பதிப்பு - 200

LANGUAGE THROUGH LITERATURE - II

STREAM – A

Semester: II **Hours: 6**

Code : 17GE2GSA2 **Credits: 3**

COURSE OUTCOMES:

- Impart effective communication skills to the learners.
- Read and understand language and descriptions of topics from a variety of texts.
- Discuss and respond to the content of a text orally and in writing.
- Write effective and coherent paragraphs.
- Learn how to use the correct use of vocabulary.

UNIT I: PROSE **1 hour**

A.P.J Abdul Kalam - My Visions for India

A.J.Cronin - The Best Investment I Ever Made

UNIT II: POETRY **1 hour**

Rabindranath Tagore - Where the Mind is Without Fear

George Herbert - The Pulley

UNIT III: SHORT STORY **1 hour**

Guy de Maupassant - The Necklace

Leo Tolstoy - Little Girls Wiser than Men

R.K. Narayan - An Astrologer's Day

UNIT IV: ONE ACT PLAYS **1 hour**

Norman MckInnel - The Bishop's Candlesticks

G.B. Shaw - A Meeting in a Forest

UNIT V: GRAMMAR & CREATIVE WRITING **2 hours**

Concord

Active voice and Passive voice

Question Tag

Speech Writing

Advertisement Writing

Report Writing

COURSE BOOK::

- Limelight-2. SSK Publishers and Distributors, Chennai: 2016.
- Savarimuttu,J.S Rohan,G.Petricia Alphine Nirmala. English Grammar and usage – An ideal Companion For Advanced Learners .New Century Book House (P) Ltd, Chennai, 2016.

LANGUAGE THROUGH LITERATURE- II - 17GE2GSA2

QUESTION PATTERN

STREAM – A

Time: 3 hours	**Marks : 60**
I. Choose the best answer (from units I & II)	10x1=10
II. Answer any two of the following in a paragraph of 100 words each (two out of four from units I & II)	2x5=10
III. Answer any two of the following in an essay of 300 words each (two out of four from units I, II, III & IV)	2x10=20
IV. Fill in the blanks (from Concord)	2
V. Rewrite the following sentences as directed (from Voice)	3
V. Add Question Tags for the following	5
VI. Speech writing	5
VII. Advertisement writing (OR) Report writing	5

LANGUAGE THROUGH LITERATURE - II

STREAM -B

Semester: II **Hours: 6**

Code : 17GE2GSB2 **Credits: 3**

COURSE OUTCOMES

- Select texts, expose to a range of contexts where the language is used to meet a variety of real life and communication needs.
- equip the students in the relevant English language skills necessary for success in various competitive examination.
- train the students to use the language potentials in language skills
- Enhance language through a task- based and learner- centric syllabus
- Carry out all the LSRW skills

UNIT I: PROSE 2 hours

Jawaharlal Nehru - The Ganga

Bernard Shaw - How I became a public Speaker

UNIT II: POETRY 1 hour

John Masefield - Laugh and be Merry

Rupert Brooke - Menelaus and Helen

UNIT III: SHORT STORY 1 hour

Oscar Wilde - The Selfish Giant

H.H Munro (Saki) - The Story Teller

UNIT IV: COMMUNICATIVE EXPRESSIONS 1 hour

Offering Help

Apologizing

Making Suggestions

Expressing Likes and Dislikes

UNIT V: COMPOSITION AND GRAMMAR 1 hour

1. Comprehension
2. Tense
3. Concord

BOOKS FOR REFERENCE:

- Savarimuttu,J.S Rohan,G.Petricia Alphine Nirmala. *English Grammar and usage – An ideal Companion for Advanced Learners* .New Century Book House (P) Ltd, Chennai, 2016.

LANGUAGE THROUGH LITERATURE - II - 17GE2GSB2

QUESTION PATTERN

Stream-B

Time: 3 hours **Marks: 60**

I. Choose the best Answer. (from Units I & II)	10 x1=10
II. Answer any two of the following in a paragraph of 100 words each (two out of four from Units I, II & III)	2x5=10
III. Answer any two of the following in an essay of 300 words each (two out of four from Units I, II & III)	2x10=20
IV. Matching the expressions. (from Unit IV)	5
V. a) Read the passage and answer the following questions. (from Unit V)	5
b) Fill in the blanks with suitable tense. (from Unit V)	10

GENERAL CHEMISTRY-III

Semester: II **Hours: 5**

Code : 17CH2MC03 **Credits: 3**

COURSE OUTCOMES:

- Associate the properties of gases with gas laws
- Discuss the properties of real gases
- Gain knowledge of aliphatic alcohols, ethers, thioethers and Grignard reagents
- Apply VB, VSEPR and MO theories to the structure of compounds
- Draw and explain the molecular orbital diagram for homo and hetero nuclear diatomic molecules

UNIT I: GASEOUS STATE I

Ideal gases- kinetic molecular theory of gases- derivation of gas laws: Boyle's law, Charle's law, Avagadro's law, ideal gas equation, Graham's law of diffusion- kinetic energy and temperature- Maxwell's distribution of molecular velocities(no derivation)- effect of temperature on distribution of molecular velocities- types of molecular velocities- relation between molecular velocities- collision parameters: collision diameter, collision number, mean free path **(15 Hours)**

UNIT II: GASEOUS STATE II

Real gases - deviation of real gases from ideal behavior- effect of temperature on deviations from ideal behavior- derivation of van der Waals equation of state - discussion of the van der Waals equation- critical constants - P-V isotherms of carbon dioxide - Joule Thomson effect - inversion temperature - relation between inversion temperature and Joule Thomson coefficient (equation only) - liquefaction of gases: Linde's and Claude's processes **(15 Hours)**

UNIT III: ALIPHATIC ALCOHOLS

Classification - preparation of aliphatic alcohols from alkenes (hydroboration, oxidation, oxymercuration, demercuration) - preparation of glycerol and glycol - estimation of hydroxyl groups in a polyhydric alcohol

ETHERS:

Zeisel's method of estimating alkoxy groups

THIO ETHERS:

Mustard gas - preparation - uses

ORGANO METALLIC COMPOUNDS:

Grignard reagents - preparation and synthetic applications of Grignard reagents **(15 Hours)**

UNIT IV: CHEMICAL BONDING I

Valence bond theory - overlap of orbitals, s-s, s-p and p-p overlap - sigma and pi bonds - tetrahedral arrangement of carbon- hybridization - structure of sp, sp^2, sp^3, sp^3d, sp^3d^2 and sp^3d^3 with suitable examples - VSEPR theory - structure of H_2O, NH_3, XeF_2, NO_3^- and ClO_4^- **(15 Hours)**

UNIT V: CHEMICAL BONDING II

Molecular orbital theory - pictorial representation of combination of atomic orbitals to form molecular orbitals- difference between bonding and antibonding molecular orbitals- bond order- MO diagram for simple homo and hetero nuclear diatomic molecules : H_2, H_2^+, He_2, N_2, O_2, CO and NO - difference between VBT and MOT **(15 Hours)**

COURSE BOOKS:

1. B.R. Puri, L.R. Sharma and S.Pathania, Principles of Physical Chemistry, Vishal Publishing Co, 46th edition, 2012. **Unit I and II**
2. M.K.Jain and S.C.Sharma, Modern Organic Chemistry, Vishal Publishing Co., 4th edition, 2013 **Unit III**
3. B.R.Puri, L.R.Sharma and K.C. Kalia, Principles of Inorganic Chemistry, Milestone Publishers, 31st edition, 2012 **Unit IV and V**

BOOKS FOR REFERENCE:

1. P.L. Soni and H.M Chawla, Organic Chemistry, Sultan Chand and Sons, 29th Edition, 2007
2. K.S. Tewari and N.K.Vishnoi, A COURSE BOOKS of Organic Chemistry, Vikas Publishing house Pvt. Ltd., 3rd edition, 2006.
3. P.L. Soni and Mohan Katyal, COURSE BOOKS of Inorganic Chemistry, Sultan Chand and Sons, 20th Edition, 2006.
4. Arun Bahl, B.S.Bahl, Advanced Organic Chemistry, S.Chand and company Ltd. 1st edition, 2006.
5. R.D. Madan Modern Inorganic Chemistry, S.Chand and company Ltd., 3rd edition, 2012.
6. J.D. Lee, Concise Inorganic Chemistry, Blackwell science Ltd., 5th edition, 1996.

GENERAL CHEMISTRY-IV

Semester: II **Hours: 4**

Code : 17CH2MC04 **Credits: 2**

COURSE OUTCOMES:

- Describe the various aspects of colloidal state
- Acquire knowledge on aliphatic aldehydes, ketones, carboxylic acids and hydroxy acids
- Explain the concepts of nuclear chemistry and radioactivity
- Associate the properties of carboxylic acids and hydroxy acids with structure
- Recognize the application of radio isotopes in various fields

UNIT I: COLLOIDAL STATE:

Definition - types of colloids - classification of colloidal systems - preparation of lyophobic colloidal solutions: electrical dispersion and condensation methods - purification methods: electro dialysis and ultra filtration - origin of charge on colloidal particles- protective colloids - Gold number - coagulation of colloidal sols: Hardy - Schulze rule - applications of colloids **(12 Hours)**

UNIT II: ALIPHATIC ALDEHYDES AND KETONES:

General methods of preparation of aldehydes and ketones: from acid chlorides and cyanides - properties: structure and reactivity of carbonyl group - nucleophilic addition to carbonyl group - distinction between aldehydes and ketones - preparation and uses of chloral and mesityl oxide **(12 Hours)**

UNIT III: ALIPHATIC CARBOXYLIC ACIDS:

Nomenclature - structure of carboxylic acid and anions - acidity - preparation from primary alcohols and cyanides - properties: conversion to esters and amides

UNSATURATED CARBOXYLIC ACIDS:

Preparation of acrylic acid - crotonic acid

HYDROXY ACIDS:

Preparation and properties of lactic acid and tartaric acid - action of heat on hydroxy acids **(12 Hours)**

UNIT IV: NUCLEAR CHEMISTRY

Nuclear chemistry - Nuclear particles - packing fraction - mass defect - binding energy of the nucleus - binding energy and stability - nuclear fission: atom bomb- nuclear fission: hydrogen bomb, energy of the sun- nuclear reactors **(12 Hours)**

UNIT V: RADIOACTIVITY

Radioactivity -rate of radioactive disintegration - units of radioactivity - half life period - nature of radiations from radioactive elements - group displacement law - Geiger Muller counter - applications of radio isotopes in reaction mechanism, medicine, agriculture - carbon dating -artificial radioactivity-artificial transmutation of elements - cyclotron **(12 Hours)**

COURSE BOOKS:

1. B.R. Puri, L.R. Sharma and S.Pathania, Principles of Physical Chemistry, Vishal Publishing Co, 46th edition, 2012 **Unit I**
2. M.K.Jain and S.C.Sharma, Modern Organic Chemistry, Vishal Publishing Co., 4th edition, 2013 **Unit II and III**
3. B.R.Puri, L.R.Sharma and K.C. Kalia, Principles of Inorganic Chemistry, Milestone Publishers, 31st edition, 2012 **Unit IV and V**

BOOKS FOR REFERENCE:

1. P.L. Soni and H.M Chawla, Organic Chemistry, Sultan Chand and Sons, 29th Edition, 2007
2. K.S.Tewari and N.K.Vishnoi, A COURSE BOOKS of Organic Chemistry, Vikas Publishing house Pvt. Ltd., 3rd edition, 2006
3. Arun Bahl , B.S.Bahl, Advanced Organic Chemistry, S.Chand and company Ltd. 1st edition, 2006
4. P.L. Soni and Mohan Katyal, COURSE BOOKS of Inorganic Chemistry, Sultan Chand and Sons, 20th Edition, 2006
5. R.D.Madan Modern Inorganic Chemistry, S.Chand and company Ltd., 3rd edition, 2012
6. J.D.Lee, Concise Inorganic Chemistry, Blackwell science Ltd., 5th edition, 1996

PRACTICAL: INORGANIC QUALITATIVE ANALYSIS

(Examination at the end of II Semester)

Semester: I and II **Hours: 3**

Code : 17CH1CP01&17CH2CP01 **Credits: 3**

- Identify various ions present in a given inorganic sample.
- Analyze confirmatory and spot tests for ions.
- Show techniques like precipitation and Centrifugation.
- Identify and eliminate interfering anions in a given sample and give a standard laboratory report.
- Test and interpret the solubility of inorganic Salts and work as laboratory technician.

Analysis of a mixture containing two cations and two anions of which, one is interfering anion. Semi-micro method is followed.

ANIONS:

Carbonate, sulphate, nitrate, chloride, bromide, oxalate, borate, phosphate, chromate and fluoride

CATIONS:

Lead, copper, cadmium, bismuth, antimony, iron, aluminium, zinc, manganese, cobalt, nickel, barium, strontium, calcium, magnesium and ammonium

COURSE BOOK:

1. V. Venkateswaran, R. Veerasamy and A. R. Kulandaivelu , Basic principles of Practical chemistry , Sultan Chand and sons, 2nd edition, 2012

ALLIED MATHEMATICS - II

Semester: II **Hours: 5**

Code : 17MA2AC02 **Credits: 4**

COURSE OUTCOMES:

- Identify the methods of solving linear differential equations with variable coefficients.
- Solve ordinary differential equations using Laplace and inverse Laplace transform.
- Formulate and solve partial differential equations using some standard forms.
- Compute vector integration and vector differentiation.
- Apply the concept of line and surface integrals in solving double and triple integrals.

UNIT I

Homogeneous linear equations of second order - linear equations with variable coefficients - variation of parameters. **(15 Hours)**

UNIT II

Laplace transform - Definitions - Theorems on Laplace transforms - Evaluation certain integrals using Laplace Transform - inverse Laplace transform. Solving ordinary differential equations using Laplace transform. **(15 Hours)**

UNIT III

Partial differential equations - formation of PDE - methods of solving first order PDE - some standard forms. **(15 Hours)**

UNIT IV

Vector differentiation - Vector differential operator - gradient - Directional derivative - divergence and curl - Solenoidal and irrotational vectors. **(15 Hours)**

UNIT V

Vector integration - line integrals - surface integrals - theorems of Green, Gauss and Stokes (problems only). **(15 Hours)**

COURSE BOOK:

Course material compiled by the Department

BOOKS FOR REFERENCE:

1. S. Arumugam and A. Thangapandi Issac, Ancillary Mathematics Paper II, New Gamma Publishing House, 1996.
2. S. Arumugam and A. Thangapandi Issac, Ancillary Mathematics Paper III, New Gamma Publishing House, 1997.

ALLIED ZOOLOGY-II

PHYSIOLOGY, EVOLUTION, ECOLOGY AND EMBRYOLOGY

Semester: II **Hours: 3**

Code : 17ZO2AC02 **Credits: 3**

COURSE OUTCOMES:

- Discuss various physiological process of life.
- Explain measures of birth control and immunization schedule.
- Restate biochemical origin of life.
- Relate man with environment.
- Explicate principles and various techniques in Embryology.

UNIT I

Food-Physiological role of carbohydrate, proteins and lipids - balanced diet. Malnutrition. Vitamins-sources and deficiency diseases. Structure and functions of human heart, Electrocardiogram. **(9 Hours)**

UNIT II

Blood grouping, Rh factor, Immunization schedule for children. Excretion - Structure of nephron, formation of urine, kidney stones, dialysis, nephritis, birth control. **(9 Hours)**

UNIT III

Biochemical origin of life, Geological time scale, mimicry and coloration, Theories-Lamarckism, Darwinism, Neo Lamarckism and Neo Darwinism. Speciation - Origin of new species. **(9 Hours)**

UNIT IV

Pond ecosystem, food chain and food web, nitrogen cycle, animal association-symbiotic commensalism, mutualism and parasitism. Pollution-types, causes, effects and prevention. Wild life conservation. **(9 Hours)**

UNIT V

Gametogenesis, Placentation in mammals - Classification and functions Menstrual cycle, pregnancy, Twins, test tube baby, IVF (Invitro Fertilization). **(9 Hours)**

COURSE BOOKS:

1. Arumugam N., (1993) Embryology, Ecology and physiology. Saras Publications, Nagercoil
2. Arumugam N., A Text book of Evolution. Saras Publications, Nagercoil.

ALLIED ZOOLOGY - II - LAB

PHYSIOLOGY, EVOLUTION, ECOLOGY AND EMBRYOLOGY LAB

Semester: II **Hours: 2**

Code : 17ZO2APO2 **Credit: 1**

COURSE OUTCOMES:

- Perform experiments to analyse the biomolecules qualitatively.
- Identify blood groups and investigate Hb content in human blood.
- Estimate oxygen content in various water samples.
- Analyse evolutionary importance of some selected specimens.

1. Qualitative analysis of carbohydrates, protein and lipids
2. Estimation of Hemoglobin in human blood
3. Blood grouping in man
4. Preparation of human blood smears
5. Estimation of oxygen content in various water samples
6. Analysis of variation in fingerprints

SPOTTERS

Haemometer, Leaf insect, Chameleon, Cotyledonary placenta, Shark and sucker fish, Twin study

EVERYDAY CHEMISTRY

Semester: II **Hours: 2**

Code : 17CH2SK02 **Credits: 2**

COURSE OUTCOMES:

- Compute various physical and chemical parameters of water.
- Associate the knowledge on oils and fats and Explain the chemistry of fermentation processes.
- Predict the preventive methods of corrosion.
- Discuss the processes of dyeing and applications of dyes.
- Create skills to develop entrepreneurship.

UNIT I

WATER:

Acidity and alkalinity of water - determination of free carbon dioxide in a sample of water - determination of acidity and alkalinity of a water sample - hardness of water - types of hardness - estimation of hardness of water- dissolved oxygen and oxygen demand - determination of oxygen dissolved in a water sample **(6 Hours)**

UNIT II

OILS AND FATS:

Occurrence and extraction - distinction between oils and fats - general chemical characteristics - analysis of oils and fats - rancidity number - acid value- saponification value - iodine value - Reichert - Meissel value - acetyl value- Polenske value - definition - significance and determination - soaps -cleansing action of soaps - synthetic detergents **(6 Hours)**

UNIT III

CORROSION OF METALS:

Definition-various methods of preventing corrosion - coating with other metals (galvanizing, tinning and electro plating) - cathodic protection and painting - corrosion inhibitors **(6 Hours)**

UNIT IV

DYES:

Introduction - sensation of colors - fibers to be dyed - cross dyeing - basic operation of dyeing - formation of dye on the fiber **(6 Hours)**

UNIT V

COTTAGE INDUSTRIAL GOODS:

Preparation of face powder, shampoo, agarbatti, camphor tablets, pain balm, tooth paste, washing powder, detergents, cleaning powder, ink, phenoyl and candles **(6 Hours)**

COURSE BOOK:

Study material prepared by the Chemistry Department

BOOKS FOR REFERENCE:

1. O.P. Veeramani and A.K. Narula, Applied Chemistry Theory and Practice, New Age International (P) Limited, 2nd edition, 1995 **Unit I**
2. P. L. Soni and H.M. Chawla, COURSE BOOKS of Organic chemistry, Sultan Chand and Sons Educational publishers 29th edition, 2007 **Unit II**
3. R. Norris Shreve and Joseph, A. Brink, Chemical process industries, McGraw Hill Kogakusha, Ltd., 4th edition, 1997 **Unit III**
4. B. K. Sharma, Industrial Chemistry, Goel Publishing House, Meerut, 14th edition, 2008 **Unit IV and V**
5. Hand book of reserved small cottage and tiny industries, SBP Board of Consultants and Engineers Pvt. Ltd., 7th edition, 1984 **Unit V**

பொதுத்தமிழ் - காப்பிய இலக்கியம்

பருவம்: மூன்று **நேரம்: 5**

குறியீடு: 17GT3GS03 **புள்ளி: 3**

நோக்கம்:

- ❖ காப்பிய இலக்கியங்களின் சிறப்புக்களை அறிந்து கொள்வர்.
- ❖ ஐம்பெரும் காப்பியங்கள், பிறகாப்பியங்களின் பக்திச்சிறப்புக்களை உணர்ந்து கொள்வர்.
- ❖ அகப்புற இலக்கியச் செய்திகளை அறிந்து கொள்வர்.
- ❖ வணிகச் செய்திகளைத் தெரிந்து கொள்வர்.
- ❖ தமிழிலக்கியத்தில் காணலாகும் அறவியல், அறிவியல் செய்திகளைத் தெரிந்து கொள்வர்.

அலகு 1

சிலப்பதிகாரம்	-	ஊர்சூழ் வரி
மணிமேகலை	-	உலக அறவி புக்க காதை
சீவகசிந்தாமணி	-	முக்தி இலம்பகம் (185 - 189) 11 பாடல்கள் சீலம், தானம்

அலகு 2

கம்பராமாயணம்	-	கிட்கிந்தா காண்டம் - ஆறு செல் படலம் 10 பாடல்கள்
தேம்பாவணி	-	மகவருள் படலம் - சூசை கைகளில் குழந்தைநாதன்
சீறாப்புராணம்	-	பாந்தள் வதைப் படலம்

அலகு 3

பொருளிலக்கணம்	-	அகத்திணை, புறத்திணை
இலக்கிய வரலாறு	-	காப்பியம் தொடர்பான இலக்கிய வரலாறு

அலகு 4

வணிகத் தமிழ் - சங்க இலக்கியங்கள் உணர்த்தும் வணிகச் செய்திகள் பக்.75-84

வணிகக் கலைச் சொல்லாக்கம் - 50 சொற்கள்

அலகு 5

அறிவியல் தமிழ் - தமிழில் அறிவியல் - பக். 27 - 40

பாட நூல்:

தமிழ்த்துறை வெளியீடு, ஜெயராஜ் அன்னபாக்கியம் மகளிர் தன்னாட்சிக் கல்லூரி, பெரியகுளம்.

பார்வை நூல்கள்:

1 பா. சரவணன் (தொ.ஆ) - சிலப்பதிகாரம், சந்தியா பதிப்பகம், சென்னை-83, 2-ஆம் பதிப்பு - 1998.

2 இராம - லட்சுமணன் (தொ.ஆ) - மணிமேகலை, உமா பதிப்பகம், சென்னை-1, 2-ஆம் பதிப்பு - ஜனவரி - 1997.

3 திரு புலவர்.அரசு (உ.ஆ) - சீவகசிந்தாமணி, கழக வெளியீடு. 1967.

4 பேரா.அ.ச.ஞானசம்பந்தன் (ப.ஆ) - கம்பராமாயணம், நியூசெஞ்சுரி புக் ஹவுஸ், சென்னை - 98.

5 ந.ம.மரியஅருட்பிரகாசம் (உ.ஆ) - தேம்பாவணி, மாவிகா அச்சகம், நொபிலி வளாகம், கோ.புதூர், மதுரை.

6 செய்குதம்பி பாவலர் (உ.ஆ) - சீறாப்புராணம், யுனிவர்சல் பிரிண்டர்ஸ், வடக்கு உஸ்மான் சாலை, சென்னை - 1. டிசம்பர் - 2014.

7 ச. திருஞானசம்பந்தம் (தொ.ஆ) - யாப்பருங்கலக்காரிகை, கதிர் பதிப்பகம், திருவையாறு, முதற் பதிப்பு. 2007

8 எம்.ஆர். அடைக்கலசாமி - இலக்கிய வரலாறு, ராசி பதிப்பகம், முதற்பதிப்பு. 1960. சென்னை- 73.

9 மணவை முஸ்தபா - காலம் தேடும் தமிழ், மீரா பதிப்பகம், சென்னை-40. 1993.

10 பொ. மா. பழனிச்சாமி - இலக்கியக் கதிர், நியூ செஞ்சுரி புக்ஹவுஸ், சென்னை-40. முதற்பதிப்பு 2010.

11 நாராயண வேலுப் பிள்ளை - உரைநடைத் தமிழ் - ஐம்பெருங் காப்பியங்கள், நர்மதா பதிப்பகம், சென்னை - 1, முதற்பதிப்பு 1999.

LANGUAGE THROUGH LITERATURE - III

STREAM - A

Semester: III **Hours: 6**

Code : 17GE3GSA3 **Credits: 3**

COURSE OUTCOMES:

- Enhance critical thinking and writing.
- understand and appreciate poetry as a literary art
- Impart effective communication skills to the learners.
- Be familiar with various writers of prose, poetry and one-act plays.
- Strengthen their writing skill.

UNIT I: PROSE **30 Hours**

Indian Women	-	Dr. S. Radhakrishnan
India Through a Traveller's Eyes	-	Pearl S. Buck

UNIT II: POETRY **30 Hours**

Lochinvar	-	Sir Walter Scott
On His Blindness	-	John Milton
Time and Love	-	William Shakespeare

UNIT III: SHORT STORY **15 Hours**

After Twenty Years	-	O'Henry
The Tiger in the Tunnel	-	Ruskin Bond
Karma	-	Kushwant Singh

UNIT IV: ONE ACT PLAYS

Hijack	-	Charles Well

UNIT V: COMPOSITION AND GRAMMAR **15 Hours**

Direct and Indirect Speech

Degrees of Comparison

Punctuation

Interviewing

Resume Writing

E-mail Writing

COURSE BOOKS:

- 'Limelight-3', SSK Publishers and Distributors, Chennai, 2016.
- Savarimuttu,J.S Rohan, and Petricia Alphine Nirmala. *English Grammar and usage – An ideal Companion For Advanced Learners.* Chennai: New Century Book House (P) Ltd, 2016. Print.

LANGUAGE THROUGH LITERATURE - III - 17GE3GSA3

QUESTION PATTERN

STREAM A

Time: 3 Hours **Marks: 60**

I. Choose the best answer 10x1=10
(From Unit I & II)

II. Answer any two of the following in a paragraph of 100 words each 2x5=10
(Two out of 4 from Unit I & II)

III. Answer any two of the following in an essay of 300 words each 2x10=20
(Two out of 4 from Unit I, II, III & IV)

IV. Rewrite as directed (From Unit V)

a) Direct/ Indirect speech. 2x1=2

b) Degrees of Comparison 3x1=3

V. Rewrite with right punctuation 5x1=5
(From Unit V)

VI. Answer the following (From Unit V) 2x5=10

1. Resume writing
2. Email writing

LANGUAGE THROUGH LITERATURE - III

STREAM B

Semester: III **Hours: 6**

Code : 17GE3GSB3 **Credits: 3**

COURSE OUTCOMES:

- Use language for aesthetic effect.
- Arrange and apply activities to improve their skills.
- Develop a positive attitude towards language learning.
- Bring out oral practice effectively.
- Interact and facilitate language learning process.

UNIT I: PROSE **30 Hours**

My Greatest Olympic Prize	-	Jesse Owens
When You Dread Failure	-	A. J. Cronin

UNIT II: POETRY **15 Hours**

Good Bye Party To Miss Pushpa T.S	-	Nissim Ezekiel
A Bird Came Down the Walk	-	Emily Dickson

UNIT III: ONE - ACT PLAY **15 Hours**

Bishop's Candle Sticks	-	Norman Mckinnel
Never Never Nest	-	Cedric Mount
The Pie and the Tart	-	Hugh Chesterton

UNIT IV: COMMUNICATION SKILLS **15 Hours**

CONVERSATIONS:

1. At a bank
2. In the library
3. Reservation status
4. At the sweet shop
5. At the poly clinic
6. On the bus

UNIT V: COMPOSITION **15 Hours**

1. Writing Advertisement
2. Story Completion

GRAMMAR

1. Question with answers 'Yes' or 'No'.
2. Active Voice & Passive Voice

BOOKS FOR REFERENCE:

1. Siva, Anthony, Dr. Gunasekaran. "Six One-Act Plays". Chennai: Pavai Publications, Royapettah, 2009.
2. Kaleem, Nafeesa. "Six One Act-Plays". Chennai: Anu Chitra Publications, West Mambalam, 1985.
3. Effective Communication in English. Board Of Editors, 2013.
4. Savarimuttu,J.S Rohan, and Petricia Alphine Nirmala. *English Grammar and usage – An ideal Companion For Advanced Learners.* Chennai: New Century Book House (P) Ltd, 2016.Print.

LANGUAGE THROUGH LITERATURE - III - 17GE3GSB3

STREAM B

QUESTION PATTERN

Time: 3 Hours	**Marks: 60**
1. Choose the best answer (from Unit I & II)	10 x1=10
2. Match the following (from Unit I based on vocabulary)	5 x 1=5
3. Answer any two of the following in a paragraph of 100 words each. (Two out of 4 from unit I, II &III)	2 x 5=10
4. Answer any two of the following in an essay of 300 words each (Two out of 4 from unit I, II &III)	2 x 10=20
5. Answer any one of the following questions. (One out of 3 from unit IV)	5
6. Answer any one of the following questions.(unit-V)	5
a) Writing Advertisement Or b) Story Completion	
7. Rewrite as directed: (unit-V)	
a) Questions with answers ' Yes'/ 'No'.	3X1=3
b) Active Voice and Passive Voice.	2X1=2

ORGANIC CHEMISTRY - I

Semester: III **Hours: 3**

Code : 17CH3MC05 **Credits: 3**

COURSE OUTCOMES:

- Describe the various concepts of stereo isomerism
- Explain about geometrical isomerism in cyclopropane dicarboxylic acid
- Identify the structure of aromatic and non aromatic compounds
- Recognize the Principles and applications of Huckel's rule
- Explain about nucleophilic and electrophilic substitution reaction

UNIT I: GEOMETRICAL ISOMERISM

Stereo isomerism - definition - geometrical isomerism - definition - cause of geometrical isomerism: isomerism of maleic acid, fumaric acid, 2-butene and oximes - nomenclature of geometrical isomers: E - Z system - properties of geometrical isomers - geometrical isomerism in cyclopropane dicarboxylic acids and cumulenes. **(9 Hours)**

UNIT II: OPTICAL ISOMERISM

Definition - elements of symmetry - chirality - cause of optical activity - optical isomerism in lactic, malic and tartaric acids - enantiomers and diastereoisomers: definition, properties and distinction with examples - configuration - relative and absolute configuration - R and S notation - resolution: definition, chemical method - racemisation: definition, mechanism - asymmetric synthesis: definition - synthesis in presence of optically active reagents - Walden inversion : definition - mechanism. **(9 Hours)**

UNIT III: AROMATICITY

Reasons for separate classification of aromatic compounds - position isomerism of benzene derivatives - classification and nomenclature - structure of benzene - valence bond theory - molecular orbital theory - aromaticity: Huckel's rule, anti aromatic and non aromatic compounds. **(9 Hours)**

UNIT IV: ORIENTATION

Orientation - definition - Korner's absolute method - relative method - dipole moment measurement method - rules of orientation: Korner's rule, Crum Brown, Gibson rule, Vorlander's rule, Hammick and Illingworth's rule - directive influence of groups - introduction of a third group into the benzene ring - activation and deactivation of benzene nucleus - theory of orientation: electronic interpretation of ortho, para and meta directive influence. **(9 Hours)**

UNIT V: AROMATIC SUBSTITUTION

Nucleophilic substitution: unimolecular and bimolecular mechanisms: elimination addition (benzyne) mechanism - free radical substitution - electrophilic substitution: mechanism of chlorination, nitration, sulphonation and alkylation of benzene. **(9 Hours)**

COURSE BOOK:

M. K. Jain, S. C. Sharma, Modern Organic Chemistry, Vishal Publishing Co., 4th edition, 2014.

BOOKS FOR REFERENCE:

1. K S Tewari and N K Vishnoi, A Text Book of Organic Chemistry, Vikas Publishing House Pvt. Ltd., 3rd edition, 2011.
2. P.L. Soni and H.M. Chawla, Text Book of Organic Chemistry, Sultan Chand and Sons, Reprint, 2014.
3. I.L. Finar, Organic Chemistry, volume II, Dorling Kindersley, 5th edition, 2008.

PHYSICAL CHEMISTRY-I

Semester: III **Hours: 4**

Code : 17CH3MC06 **Credits: 3**

COURSE OUTCOMES:

- Describe the principles of photochemistry
- Determine the order of chemical reaction through concepts of chemical kinetics
- Gain sufficient knowledge about the various concepts in catalysis and adsorption
- Explain the laws of photochemistry and Describe the kinetics of photochemical reactions
- Gain knowledge about applications of catalysts and adsorption

UNIT I: CHEMICAL KINETICS

Rate of a reaction - derivation of rate constant for first and second order reactions - hydrolysis of ethyl acetate, saponification of esters - zero order reactions - half - life time of 1st order reaction - order of a reaction methods for determining order of a reaction - order and molecularity of a reaction - effect of temperature on reaction rates - concept of activation energy - Arrhenius equation - collision theory - Lindemann theory of unimolecular reactions. **(12 Hours)**

UNIT II: PHOTOCHEMISTRY I

Photochemical reactions - definition - difference between thermal and photochemical reactions - consequences of light absorption - Jablonski diagram- fluorescence - phosphorescence - photosensitization - chemiluminescence - laws of photochemistry: Lambert - Beer's law, Grothus - Draper law and Einstein law of photochemical equivalence - quantum yield - reasons for high and low yield - experimental determination of quantum yield. **(12 Hours)**

UNIT III: PHOTOCHEMISTRY II

Kinetics of some important photochemical reactions: decomposition of HI - combination of hydrogen and chlorine - dimerisation of anthracene - Lasers: principles, types - application of lasers in chemistry. **(12 Hours)**

UNIT IV: CATALYSIS

General characteristics - types of catalysis - homogeneous catalysis: acid base catalysis - enzyme catalysis -effect of temperature on enzyme catalyzed reactions- heterogeneous catalysis - auto catalyst - catalytic poison - promoters - positive and negative catalysts - surface catalysis - industrial applications of catalysts.

(12 Hours)

UNIT V: ADSORPTION

Definition - difference between adsorption and absorption - physical and chemical adsorption - factors influencing adsorption - Freundlich adsorption isotherm - Langmuir adsorption isotherm - applications. **(12 Hours)**

COURSE BOOK:

B.R.Puri, L.R.Sharma and Madan S.Pathania, Principles of Physical chemistry, Vishal Publishing Co, 47th edition, 2016.

BOOK FOR REFERENCE:

Arun Bahl, B.S. Bahl and G.D. Tuli, Essentials of Physical chemistry, S. Chand and Company Pvt. Ltd. Reprint 2014.

PRACTICAL: ORGANIC ANALYSIS

Semester: III **Hours: 3**

Code : 17CH3CP02 **Credits: 2**

COURSE OUTCOMES:

- Recognize the principles of organic qualitative analysis
- Analyze various organic compounds using documented procedures
- Detect the presence of special elements such as nitrogen and sulphur
- Identify the functional groups of an organic substance by characteristic tests
- Apply skills on systematic microscale analysis and preparation of solid derivative

Microscale analysis of the organic compounds containing one or two functional groups: acids, phenols, aldehydes, ketones, esters, nitro compounds, amines (primary, secondary and tertiary), amides (mono and di), anilides, carbohydrates. The compound is identified as aliphatic or aromatic, saturated or unsaturated, special elements present/absent, nature of functional group and the functional group is confirmed by the preparation of a solid derivative.

BOOK FOR REFERENCE:

Practical manual prepared by the Chemistry Department.

ALLIED PHYSICS THEORY - I

MECHANICS, PROPERTIES OF MATTER AND THERMAL PHYSICS

Semester: III **Hours: 3**

Code : 17PH3AC01 **Credits: 3**

COURSE OUTCOMES:

- Explain the types of forces and energy.
- Describe the kinematics of rotational motion.
- Explain the fundamental laws of gravitation and determination.
- Determine the moduli of elasticity through experimental learning.
- Analyze the various laws of heat transfer and its applications.

UNIT I: FORCE, WORK, POWER AND ENERGY

Newton's law gravitation - Coulomb's law - Central Forces - Conservative Forces - Non-Conservative Forces - Friction - Limiting friction, Coefficient of Friction and Angle of Friction - Laws of Friction - Motion of bodies along an inclined plane- Work - Work done by a varying force - Energy - K.E Potential Energy - Power.

(9 Hours)

UNIT II: ROTATIONAL MOTION

Angular velocity - Angular acceleration - Normal Acceleration - Centripetal Force - Centrifugal Force - Torque and angular momentum - Expression for Torque in Rotational Motion - Expression for Angular momentum of a Rotating Rigid body - Kinetic energy of rotation - Expression for work in rotational motion - Expression for power in rotational motion - Moment of inertia - Perpendicular axes Theorem - Theorem of parallel axes - Moment of inertia of a thin circular ring - Moment of inertia of a solid sphere - M.I of a Hollow sphere about its Diameter. **(9 Hours)**

UNIT III: GRAVITATION

Kepler's laws of planetary motion - Newton's law of gravitation - Mass and Density of the Earth - Determination of G-Boys 'Method - The compound pendulum - Variation of g with latitude or rotation of the earth-Variation of with g altitude - Variation of g with depth - Artificial Satellites. **(9 Hours)**

UNIT IV: ELASTICITY AND VISCOSITY

Different Moduli of Elasticity - Poisson's Ratio - Bending of Beams - Expression for the bending moment - Depression of the loaded end of a cantilever - Determination of Young's modulus by Uniform Bending - Determination of Young's modulus by Non-Uniform Bending - I Section Girders - Torsion of a Cylinder - Work done in Twisting - Torsional oscillations of a body - Rigidity modulus by torsion pendulum.

VISCOSITY

Derivation of Poiseuille's Formula - Poiseuille's method for determining coefficient of viscosity of a liquid - Equation of continuity - Bernoulli's Theorem - Applications of Bernoulli's Theorem - Pitot Tube. **(9 Hours)**

UNIT V: CONDUCTION, CONVECTION AND RADIATION

Thermal conductivity - Lee's disc method- Analogy between Heat flow and Electric current - Wiedemann - Franz Law- Convection in the atmosphere - Lapse rate - Stefan's Law - Determination of solar constant - Water flow pyrheliometer- Temperature of the sun-Wien's displacement law - Solar spectrum - Energy distribution in Black Body Spectrum-Statement of Planck's law of radiation - Wien's Law - Rayleigh-Jeans law. **(9 Hours)**

COURSE BOOKS:

1. R. Murugeshan - Mechanics, Properties of Matter and Sound - Ist Edition Jun 2012 - Annai Print Park, Madurai.
2. R. Murugeshan - Thermal physics - Ist Edition Sep. 2007-Vivekanada Press, Madurai.

UNIT I : Chapter-1: All sections (Book 1)

UNIT II : Chapter-2: All sections (Book 1)

UNIT III : Chapter-3: All sections (Book 1)

UNIT IV : Chapter-4: All sections
Chapter-5: All sections (Book 1)

UNIT V : Chapter-3: 3.1 - 3.4 chapter 4: 4.1- 4.3
Chapter-5: All Sections (Book 2)

ALLIED PHYSICS PRACTICAL - I

Semester: III **Hours: 2**

Code : 17PH3AP01 **Credit: 1**

COURSE OUTCOMES:

- Determine moduli of elasticity through experiments.
- Determine the parameters of mechanics through experiential learning.
- Perform and verify the fundamental laws of sound.

LIST OF PRACTICALS (Any Six)

1. Young's Modulus - Uniform Bending - Pin and Microscope.
2. Young's Modulus - Uniform Bending - Optic lever - Scale and Telescope method.
3. Young's Modulus - Non-uniform Bending - Optic Lever - Scale and Telescope method.
4. Young's Modulus - Non-uniform Bending - Pin and Microscope.
5. Torsion Pendulum - Rigidity modulus.
6. Determination of g using Compound Pendulum.
7. BG - Comparison of Capacitances.
8. Low Range Voltmeter Calibration using Potentiometer.
9. Sonometer - Verification of Laws.

ENVIRONMENTAL STUDIES

Semester: III **Hours: 2**

Code : 17ES3GS01 **Credits: 2**

COURSE OUTCOMES:

- Recall the components of our planet earth.
- Elucidate and understand the importance of Natural resources.
- Summarise the energy status of the environment.
- Acquire knowledge on the conservation of our environment.
- Analyse the significance of water and climate towards sustainable development.

UNIT I: MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES

Definition, scope and importance - Need for public awareness **(2 Hours)**

UNIT II: NATURAL RESOURCES

Classification of Resources: Renewable and non - renewable resources - Forest resources, water resources, mineral resources, food resources, energy resources, Land resources - associated problems; Role of an individual in conservation of natural resources - Equitable use of sources for sustainable life styles. **(8 Hours)**

UNIT III: ECOSYSTEMS

Concept of an ecosystem - Structure and function of an ecosystem - producers, consumers and decomposers - Energy flow in the ecosystem - Food chains, food webs and ecological pyramids - Introduction, types, characteristic features, structure and function of the following Eco system: Forest, grass land, desert and aquatic. **(6 Hours)**

UNIT IV: ENVIRONMENTAL POLLUTION

Definition, Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards, Solid waste management, Role of an individual in prevention of pollution.

(8 Hours)

UNIT V: SOCIAL ISSUES AND THE ENVIRONMENTS

From unsustainable to sustainable development - Urban problems related to energy Water conservation, rain water harvesting, water shed management, Resettlement and rehabilitation of people, its problem and concerns, case studies, Environmental ethics, Climate change, global warming, acid rain and ozone layer depletion, nuclear accidents and holocaust, case studies. Waste land reclamation. Environmental protection act, air act, water act, wild life protection act.

(6 Hours)

FIELD WORK

Visit to local area to document environmental assets- river/forest/ grassland/hill/ mountain.

COURSE BOOK:

Murugeshan, R., (2007). Environmental science and Engineering, Millenium publication, Madurai.

UNIT I : Section - 1.1 & 1.2

UNIT II : Section - 1.3 to 1.37

UNIT III : Section - 2.1 to 2.7 & 2.10 to 2.27

UNIT IV : Section - 3.1 to 3.37

UNIT V : Section - 4.1 to 4.17

Note: Tamil Version for Tamil Literature and History Tamil Medium Students.

OFFICE AUTOMATION (Stream B)

Semester: III **Hours: 2**

Code : 17AE3SK03 **Credits: 2**

COURSE OUTCOMES:

- Handle the tools of MS office
- Create animations, presentations and documents.
- Prepare spreadsheets using MS Excel for various applications.
- Develop computational skills
- Use DTP skills to become an Entrepreneur.

MICROSOFT OFFICE 2017

MS WORD:

1. Formatting
2. Table Creation
3. Mail Merge
4. Preparation of advertisement using drawing tool

MS EXCEL:

5. Excel Function (statistical)
6. Data filtering and sorting
7. Mark sheet, pay bill Preparation
8. Data analysis using chart

MS ACCESS:

9. Database Creation & Mark Sheet Preparation
10. Forms and Reports Creation

MS POWERPOINT:

11. Theme - based presentation with Animation Effects

MS OUTLOOK:

12. Personalized Email and Account creation, sending mails with attachments

COURSE BOOK:

Study Material prepared by Mathematics, Physics and Chemistry.

BOOKS FOR REFERENCE:

1. D. P. Nagpal - Computer Fundamentals - S. Chand & Company Ltd, New Delhi - 1999.
2. V. Rajaraman - Fundamentals of Computers, 3rd edition - Prentice Hall of India Private Limited - 2001.
3. B. Ram - Computer Fundamentals, 3rd edition - New Age International Pvt. Ltd - 2010.

பொதுத்தமிழ் - பழந்தமிழ் இலக்கியம்

பருவம்: நான்கு **நேரம்: 5**

குறியீடு: 17GT4GS04 **புள்ளி: 4**

நோக்கம்:

- ❖ பழந்தமிழ் இலக்கிய வளங்களை அறிந்து கொள்வர்.
- ❖ பழந்தமிழ் இலக்கியங்களின் சமூகநிலையைப் புரிந்து கொள்வர்.
- ❖ பழந்தமிழ் இலக்கியத்தின் தனித்தன்மையை அறிந்து கொள்வர்.
- ❖ பழந்தமிழ் இலக்கியத்தில் காணப்படும் நயங்களைத் தெரிந்து கொள்வர்.
- ❖ பழந்தமிழ் இலக்கிய ஆசிரியர்களை அடையாளம் காண்பர்.

அலகு 1: சங்க இலக்கியங்கள் - எட்டுத்தொகை

1. நற்றிணை (2 பாடல்கள்)

"சுரும்புண விரிந்த கருங்கால்..." - குறிஞ்சி

"தொல்கவின் தொலையத்..." - பாலை

2. குறுந்தொகை (4 பாடல்கள்)

"மாசறக் கழீஇய..." - குறிஞ்சி
"ஐயவி யன்ன சிறுவீ..." - மருதம்
"கடும்புனல் தொடுத்த..." - நெய்தல்
"முட்டு வேன்கொல்.." - பாலை

3. கலித்தொகை (1 பாடல்)

"வேங்கை தொலைத்த வெறிபொறி....."- குறிஞ்சிக்கலி தோழிகூற்று

4. அகநானூறு (2 பாடல்கள்)

"வயங்கு வெள்....." குறிஞ்சி

'கார்பயம் பொழிந்த....." முல்லை

5. புறநானூறு (2 பாடல்கள்)

"கழிந்தது பொழிந்தென....."

"பன்மீன் இமைக்கும்....."

அலகு 2: பத்துப்பாட்டு

முல்லைப்பாட்டு முழுவதும்

அலகு 3: நீதி நூல்கள்

1. திருக்குறள் : அறத்துப்பால் - பொறையுடைமை, அழுக்காறாமை

2. நாலடியார் : அறத்துப்பால்

துறவு: "விளக்குப்புக....."

ஈகை: "இல்லா விடத்தும்....."

அலகு 4: இலக்கணம்

வல்லெழுத்து மிகும் இடம், மிகா இடம்

இலக்கிய வரலாறு

சங்க காலம், சங்கம் மருவிய காலம் தொடர்பான இலக்கிய வரலாறு.

அலகு 5: வணிகத்தமிழ் -அறிவியல் தமிழ்

கடல் நாகரிகம் - கடல் வாணிபம் - பக்: 233-241

உடல் அறிவியல் - பக்: 75-88

பாடநூல் :

தமிழ்த்துறை வெளியீடு, ஜெயராஜ் அன்னபாக்கியம் மகளிர் கல்லூரி. பெரியகுளம்.

பார்வைநூல்கள்:

1. வ.த. இராமசுப்பிரமணியம் (உ.ஆ) - நற்றிணை, திருமகள் நிலையம், சென்னை-17. முதற்பதிப்பு - 2009.
2. புலவர் துரைஇராசாராம் (உ.ஆ) - குறுந்தொகை, முதற்பதிப்பு 2008. திருமகள் நிலையம், சென்னை - 17.
3. முனைவர்.அ.விசுவநாதன் (உ.ஆ) - கலித்தொகை, நியூசெஞ்சுரி புக்ஹவுஸ், சென்னை - 98. முதற்பதிப்பு 2007.
4. வ.த. இராமசுப்பிரமணியம் (உ.ஆ) - அகநானூறு, திருமகள் நிலையம், சென்னை -17. முதற்பதிப்பு 2009.
5. வ.த. இராமசுப்பிரமணியம் (உ.ஆ) - புறநானூறு, திருமகள் நிலையம், சென்னை - 17. முதற்பதிப்பு 2008.
6. முனைவர்.இரா.மோகன் (உ.ஆ) - பத்துப்பாட்டு, பாவைபிரிண்டர்ஸ், சென்னை 14, முதற்பதிப்பு - 2004.
7. எஸ். கௌமாரீஸ்வரி (ப.ஆ) - திருக்குறள் பரிமேலழகர் உரை சாரதா பதிப்பகம், சென்னை - 600 014, முதற்பதிப்பு - 2002.
8. எஸ். கௌமாரீஸ்வரி (ப.ஆ) - பதினெண்கீழ்க்கணக்கு நூல்கள் சாரதா பதிப்பகம், சென்னை - 14, முதற்பதிப்பு - மார்ச் - 2009.
9. எம்மார். அடைக்கலசாமி - தமிழ் இலக்கிய வரலாறு ராசிபதிப்பகம், சென்னை - 73, பதிப்பு 35. 2002.
10. மாத்தளை சோமு - வியக்கவைக்கும் தமிழர் அறிவியல், உதகம், திருச்சி முதற்பதிப்பு 2005.
11. மணவை முஸ்தபா - காலம் தேடும் தமிழ், மீரா பதிப்பகம், சென்னை - 40, 1993.

LANGUAGE THROUGH LITERATURE - IV

STREAM A

Semester: IV **Hours: 6**

Code : 17GE4GSA4 **Credits: 4**

COURSE OUTCOMES:

- Employ knowledge of literary traditions to produce imaginative writing
- Analyze and interpret literature
- Develop their English language skills continuously
- Develop their appreciation for the purpose and pleasure of poetry and drama
- Conduct self-evaluation about their own language learning processes

UNIT I: PROSE **30 Hours**

1. Character is Destiny - S.Radhakrishnan
2. Why the Sea is Salt - Great Legends

UNIT II: POETRY **30 Hours**

1. La Belle Dame Sans Merci - John Keats
2. The Last Ride Together - Robert Browning.
3. Goodbye Party for Miss. Puspha T.S - Nissim Ezekiel

UNIT III: SHORT STORY **15 Hours**

1. Valiant Vicky - Flora Annie Steel
2. The Conjurer's Revenge - Stephen Leacock

UNIT IV: ONE ACT PLAYS

1. Mother's Day - J.B. Priestly
2. The Game of Chess - Kenneth Sawyer Goodman

UNIT V: WRITING SKILLS **15 Hours**

1. Minutes Writing
2. Book Review
3. Essay Writing
4. Prepositions
5. Conjunction

COURSE BOOKS:

1. Limelight - 4 (An Anthology of Prose, Short Story and One Act Plays)
2. Savarimuttu,J.S Rohan, and Petricia Alphine Nirmala. *English Grammar and usage – An ideal Companion For Advanced Learners.* Chennai: New Century Book House (P) Ltd, 2016.Print.

LANGUAGE THROUGH LITERATURE - IV-17GE4GSA4

STREAM A

QUESTION PATTERN

Time: 3 Hours **Marks: 60**

I. Choose the best answer 10X1=10
(From Unit I and II)

II. Answer any two of the following in a Paragraph of 100 words each. 2X5=10
(Two out of four from Unit I, & II)

III. Answer any two of the following in an essay of 300 words each. 2X10=20
(Two out of four from Unit I , II, III & IV)

IV. Answer any two of the following questions from unit V 2x5=10

1. Minutes Writing
2. Book Review
3. Essay Writing

V. Fill in the blanks.

1. Prepositions 5x1=5
2. Conjunction 5x1=5

LANGUAGE THROUGH LITERATURE - IV

STREAM B

Semester: IV **Hours: 6**

Code : 17GE4GSB4 **Credits: 4**

COURSE OUTCOMES:

- Read and understand language and description of topics from a variety of texts.
- Write describing impressions, feelings and experiences and to write about familiar topics.
- Understand familiar topics and be able to understand speech on a variety of subjects such as work, school, leisure and the main points when listening to current affairs.
- Talk about familiar topics and to give explanations and reasons for opinions, past actions and future plans.
- Understand and apply in everyday contexts, including the use of nouns, adjectives, verbs, prepositions, tenses, sentence structure and phrases.

UNIT I: PROSE **30 Hours**

1. C. Rajagopalachari - First Anniversary of Gandhiji's Death
2. J.C. Hill - Good Manners
3. James Thurber - University Days

UNIT II: POETRY **15 Hours**

1. Sarojini Naidu - Conquest
2. D.H. Lawrence - Money Madness
3. Robert Frost - Mending Wall

UNIT III: DRAMA **15 Hours**

Select Scenes from "The Merchant of Venice" by William Shakespeare.

1. The Opening Scene
2. The Casket Scene
3. The Trial Scene

UNIT IV: GRAMMAR **15 Hours**

1. Question Tag
2. Negative Sentences

UNIT V: COMMUNICATION SKILLS **15 Hours**

Information Transfer and E Language Communication

COURSE BOOKS:

1. "Variety of English for Effective Communication" - Book IV - Ed. Dr. A. Shanmugakani, Madurai: Manimekala Publishing House, 2012.
2. Savarimuttu, J.S Rohan, and Petricia Alphine Nirmala. *English Grammar and usage – An ideal Companion For Advanced Learners.* Chennai: New Century Book House (P) Ltd, 2016. Print.

LANGUAGE THROUGH LITERATURE - IV - 17GE4GSB4

STREAM B

QUESTION PATTERN

Time: 3 Hours **Marks: 60**

I. Choose the best answer 10x1=10

(From Unit I and II)

II. Match the Following 5x1=5

(Vocabulary items from Unit I)

III. Answer any two of the following in a Paragraph of 100 words each. 2x5=10

(Two out of four from Unit I, II & III)

IV. Answer any two of the following in an essay of 300 words each 2x10=20

(Two out of four from Unit I, II & III)

V. Rewrite the following as directed. (From Unit IV)

1. Question Tag 2x1=2
2. Negative Sentences 3x1=3

VI. Answer the following questions 2x5=10

(From unit V)

a) Interpreting charts and making observations.

b) Reading passage and putting the information in graphic form.

INORGANIC AND PHYSICAL CHEMISTRY

Semester: IV **Hours: 5**

Code : 17CH4MC07 **Credits: 4**

COURSE OUTCOMES:

- Predict the general characteristics of s and p block elements.
- Explain and outline the properties of transition elements.
- Recognize about importance of thermodynamics and the laws of thermodynamics.
- Apply the laws of thermodynamics for calculation of various physical parameters.
- Calculate various energy changes and heat capacities of different systems and derive the free energy functions and partial molar properties.

UNIT I: MAIN GROUP ELEMENTS

General Characteristics: Metallic character- polarizing power - polarisability- melting and boiling points - oxidizing and reducing properties - electrode potentials - oxidation states - diagonal relationship - properties of p block elements: ionization energy, electron affinity, inert pair effect and electronegativity. **(12 Hours)**

UNIT II: 'd' BLOCK ELEMENTS

General Characteristics: Electronic configuration - elements of first transition series - metallic character - atomic volumes and densities - melting and boiling points - atomic radii - ionic radii - ionisation energy - different oxidation states: variable valency - standard electrode potentials - reducing property - formation of coloured compounds - magnetic properties - tendency to form complexes - catalytic properties - comparison of transition elements with non-transition elements. **(12 Hours)**

UNIT III: I LAW OF THERMODYNAMICS

Scope and importance of thermodynamics - terminology - system - surrounding - microscopic and macroscopic properties - thermodynamic state of a system - state variables - state functions - exact and inexact differentials - extensive and intensive properties - processes and their types - nature of heat and work - First law: statement - mathematical formulation - changes in internal energy and enthalpy - heat capacity of system - heat changes at constant volume (C_v) and at constant pressure (C_p) - relationship between C_p and C_v - workdone in isothermal reversible expansion- reversible compression of an ideal gas - calculation of ΔU, q, w and ΔH for a van der Waals gas. **(12 Hours)**

UNIT IV: II LAW OF THERMODYNAMICS

Limitations of the first law of thermodynamics - need for the second law - spontaneous and reversible processes - different ways of stating second law of thermodynamics - Carnot's cycle- Carnot's theorem - efficiency of heat engine.

ENTROPY

Definition - entropy changes in reversible and irreversible processes - entropy change accompanying change of phases - calculation of entropy change of an ideal gas with change in P, V and T - entropy changes of an ideal gas in different processes - entropy of mixing of gases - physical significance of entropy.

(12 Hours)

UNIT V: FREE ENERGY FUNCTIONS

Helmholtz free energy and Gibbs free energy - variation of Gibbs free energy with temperature and pressure - criteria for reversible and irreversible processes (in terms of free energy changes only) and limitations - derivation of Gibbs Helmholtz equation.

PARTIAL MOLAR PROPERTIES

Concept of chemical potential - definition-Gibbs Duhem equation - Clapeyron Clausius equation - derivation and its applications - concept of fugacity and activity. **(12 Hours)**

COURSE BOOKS:

1. B.R. Puri, L.R. Sharma and K.C. Kalia, Principles of Inorganic chemistry, Milestone Publisher, 32nd edition, 2015. **(Unit I and II)**
2. B.R. Puri, L.R. Sharma and Madan S.Pathania, Principles of Physical chemistry, Vishal Publishing Co, 47th edition, 2016. **(Unit III, IV and V)**

BOOK FOR REFERENCE:

1. R.D. Madan, Modern Inorganic Chemistry, S. Chand and Company Pvt. Ltd., New Delhi, 3rd revised edition, 2011.

PRACTICAL: VOLUMETRIC ANALYSIS

Semester: IV **Hours: 3**

Code : 17CH4CP03 **Credits: 2**

COURSE OUTCOMES:

- Gain analytical skills in weighing of the standard substance by both chemical balance and electronic balance
- Apply the skills to do the volumetric titration in double burette method
- Estimate the amount of substance present in the given solution
- Develop problem solving skills
- Demonstrate the different types of titrations such as acidimetry, alkalimetry, permanganometry and iodometry

Double titration by Microscale Method: Preparation of a standard solution - making up of the solution to be estimated - double burette method

I ACIDIMETRY AND ALKALIMETRY

1. Estimation of sodium hydroxide
2. Estimation of sodium carbonate
3. Estimation of hydrochloric acid
4. Estimation of oxalic acid

II PERMANGANIMETRY

1. Estimation of ferrous sulphate
2. Estimation of ferrous ammonium sulphate
3. Estimation of oxalic acid

III IODOMETRY

1. Estimation of potassium dichromate
2. Estimation of copper sulphate

IV DICHROMETRY (ONLY CLASS WORK)

Estimation of ferrous sulphate using external indicator

BOOK FOR REFERENCE:

Practical manual prepared by the Chemistry Department

ALLIED PHYSICS THEORY - II

ELECTRICITY AND ELECTRONICS

Semester: IV **Hours: 3**

Code: 17PH4AC02 **Credits: 3**

COURSE OUTCOMES:

- Describe the laws of electrostatics.
- Apply the laws of electricity to a.c bridges for the electrical measurements.
- Explain magnetic effects of alternating currents.
- Explain the basic concepts of electronic components.
- Distinguish various number systems and design logic circuits using gates.

UNIT I: ELECTROSTATICS

Coulomb's Law - Electric field - Electric field due to point charge - Gauss Law- Applications of Gauss Law - Electric field due to an infinite plane sheet of charge- Field near a charged conducting cylinder - Coulomb's Theorem (Field of charged Conductor - Potential Difference - Potential at appoint due to a point charge Relation between electric field and electric potential - Capacitor - Capacitance of parallel plate capacitor - Partly filled with dielectric slab - Capacitance of the spherical capacitor (outer sphere earthed) - capacitance of the cylindrical capacitor- Energy stored in a charged capacitor-Loss of energy on sharing of charges between two capacitor. **(9 Hours)**

UNIT II: CURRENT ELECTRICITY

Kirchhoff's laws- Application of Kirchhoff law to Wheatstone's network - Sensitivity of wheatstone bridge - Wheatstone's network- Determination of the temperature of resistance-Potentiometer- Calibration of ammeter-calibration of voltmeter (Low range, High range)- Measurement of resistance using potentiometer. **(9 Hours)**

UNIT III: MAGNETIC EFFECT OF ELECTRIC CURRENT

Force on a current-carrying conductor in a magnetic field - Torque on a current in a uniform magnetic field - The D' Arsonval moving coil galvanometer (Mirror galvanometer) - Current and voltage sensitivity of a moving coil galvanometer - Moving coil ballistic galvanometer - Measurement of charge sensitivity- Difference between Dead-Bead and ballistic galvanometer - Comparison of emf of two cells using BG - Comparison of two capacitors using BG

ALTERNATING CURRENT:

EMF generated in a coil rotating in a uniform magnetic field - Mean value of AC- Root mean square value of an AC - Review of subjects - AC circuits containing resistance, Inductance and Capacitance in series (series resonance circuit) - Parallel Resonance Circuit - Comparison between series and parallel resonant circuit - Wattless current - Choke coil. **(9 Hours)**

UNIT IV: ELECTRONICS

Formation of PN junction diode - Forward and reverse biasing of a junction diode -V-I Characteristic of junction diode - Zener Diode - Experiment to study the characteristic to the Zener diode - Light emitting diode - Bridge Rectifier - Filter circuits-π-section Filter - Transistor - Working of an NPN Transistor - Common emitter configuration - Characteristics of transistor (CE mode) - Transistor biasing - CE transistor amplifier - Hartley Oscillator - Modulations - Operational amplifier - Characteristic of an OP AMP - The common mode rejection ratio - Slew Rate - Virtual Earth - Inverting Amplifier - Non inverting amplifier - Adder or summing amplifier - Difference amplifier or subtractor. **(9 Hours)**

UNIT V: NUMBER SYSTEM AND CODES

Decimal number system - Binary number system - conversation binary number into decimal number - conversation decimal number into binary number - Binary Addition, Subtraction.

LOGIC CIRCUITS

Boolean algebra - Digital logic gates - NOT Gate (Inverter) - OR Gate - AND Gate, NOR Gate - NOR gates in a universal gates - NAND gates in a universal gates - NOT Gate exclusive OR Gate. **(9 Hours)**

COURSE BOOK:

R. Murugeshan - Electricity & Electronics - 2016.

UNIT I : Chapter-1 All sections

UNIT II : Chapter-2 All sections

UNIT III : Chapter-3 All sections

UNIT IV : Chapter-4 All sections

UNIT V : Chapter-5 All sections

ALLIED PHYSICS PRACTICAL - II

Semester: IV **Hours: 2**

Code : 17PH4AP02 **Credit: 1**

COURSE OUTCOMES:

- Construct logic circuits using discrete components and IC's
- Verify Boolean laws
- Construct adder and subtractor circuits using IC's

LIST OF PRACTICALS (Any Six)

1. AND, OR, NOT - Using discrete components.
2. AND, OR, NOT - Using IC 74 Series.
3. NAND, NOR - Using IC.
4. AC - Frequency Sonometer.
5. Universal Gates.
6. LCR Series Circuit.
7. Zener Diode Characteristics.
8. Verification of Boolean theorems.
9. Half adder and Half Subtractor.

BIO INORGANIC CHEMISTRY

Semester: IV **Hours: 4**

Code : 17CH4CE1A **Credits: 3**

COURSE OUTCOMES:

- Explain the role of bioinorganic chemistry in day to day life.
- Describe the role of metals and non-metals in biological systems.
- Predict the toxicity of different metals.
- Analyze the structure and functions of metalloprotein.
- Acquire knowledge about transport and storage of metals in biological systems and describe the different metal-activation sites in metallo enzymes

UNIT I: METAL IONS IN BIOLOGICAL SYSTEMS

Introduction - role of metal ions in biological systems: Na, K, Cr, Mn, Ni, Ar, Se, Mo, Cd, I, Hg, Pb, Fe, Co, Cu and Zn. **(12 Hours)**

UNIT II: METAL TOXIFICATION

Introduction - metal toxification and detoxification of lead, cadmium,mercury and aluminium - chelate therapy - chelating agents: D-pencillamine, desferrioxamine, cis - platin and gold complexes. **(12 Hours)**

UNIT III: METALLO PROTEINS I

Introduction - metalloporphyrins - iron and copper porphyrins - oxygen carriers - structrure and function of haemoglobin, myoglobin, haemerythrin and haemocyanin - iron storage and transport - ferritin and transferring. **(12 Hours)**

UNIT IV: METALLO PROTEINS II

Introduction - cytochromes a, b and c - classification-structure and function of chlorophyll - photosynthesis - iron - sulfur protein - rubredoxin - ferredoxins-blue copper proteins - plastocyanin. **(12 Hours)**

UNIT V: METALLO ENZYMES

Introduction - zinc enzyme - carboxypeptidase (hydrolases) - iron enzymes - cytochrome P450 (oxido - reductases) - copper enzyme - superoxide dismutase (Cu Zn SOD) - iron-molybdenum enzyme - nitrogenase - nitorgenfixation - cobalt enzyme - vitamin B_{12} (Isomerases and synthases). **(12 Hours)**

COURSE BOOK:

1. B.R. Puri, L.R. Sharma and K.C. Kalia, Principles of Inorganic chemistry, Milestone Publishers, 32nd edition, 2015. **(Unit I-V)**
2. E. Huheey James, Inorganic Chemistry Principles of structure and reactivity, Dorling Kindersley India Pvt. Ltd. 4th edition**,** 2007. **(Unit I-V)**

BOOK FOR REFERENCE:

K. Hussain Reddy, Bioinorganic chemistry, New age International publishers, 1st edition, 2007.

BIO AND PHARMACEUTICAL CHEMISTRY

Semester: IV **Hours: 4**
Code : 17CH4CE1B **Credits: 3**

COURSE OUTCOMES:

- Describe the classification, preparation and properties of amino acids.
- Gain knowledge about color reactions and biological function of proteins.
- Explain the structure of Nucleic acid such as RNA and DNA.
- Analyze the structure, classification and functions of Hormones and Vitamins and Discuss the definition and application of antiseptic, analgesic drugs and anesthetics.
- Develop knowledge about various drugs and their mode of action, preparation, uses and importance and Acquire knowledge about organic pharmaceutical acids and how to stored pharmaceutical substances.

UNIT I: AMINO ACIDS

Sources - classification - preparation and properties of glycine and alanine - zwitter ion - isoelectric point.

PROTEINS

Definition - structure and colour reactions of proteins - biological functions of proteins (elementary study).

NUCLEIC ACIDS

Nucleotide - nucleoside - structure and functions of RNA and DNA. **(12 Hours)**

UNIT II: HORMONES

Definition - classification - sources - function - testosterone, progesterone - thyroxin (Structure only).

VITAMINS

Vitamins - history - definition - occurrence - classification - properties - avitaminoses - metabolism - deficiency diseases and human requirements of vitamins A, B_6, B_{12}, C, D, E and K - conversion of glucose to vitamin C . **(12 Hours)**

UNIT III: CHEMOTHERAPY I

Definition - characteristics of drugs - physical and chemical properties of drugs - mode of action.

Sulpha drugs: Preparation and uses of sulphadiazine and prontosil.

Antimalarials: preparation and uses of quinine, chloroquine, plasmoquine or pamaquine.

Antibiotics: definition - classification - some important antibiotics. pencillin, tetracyclines, chlorotetracyclines, oxytetracyclines.

Arsenical Drugs: preparation and uses of salvarsan, neosalvarsan. **(12 Hours)**

UNIT IV: CHEMOTHERAPY II

Antipyretics and Analgesic Drugs: Aspirin- morphine - paracetamol - salicin - heroin - pethidine - structure and action.

Anaesthetics: General and local - volatile anaesthetics - advantages and disadvantages - intravenous and non-volatile anaesthetics - properties and examples.

Antiseptics and Disinfectants: Difference between antiseptics and disinfectants with examples. **(12 Hours)**

UNIT V

Organic pharmaceutical aids: preservatives - antioxidants - sesquestrants - colouring - flavoring and sweetening agents - stabilizing and suspending agents - ointment bases: salicylic acid ointment - sulphur ointment - calamina lotion.

Storage of pharmaceutical substances: Temperature effect - humidity effect - effect of gases - effect of light and container. **(12 Hours)**

COURSE BOOKS:

1. Jeyashree Ghosh, Text Book of Pharmaceutical Chemistry, Publishers Sulthan Chand and Company Ltd., 1st edition, 1997. **(Unit II, IV and V)**
2. P.L. Soni, Text Book of Organic Chemistry, Published by Sultan Chand and Sons, Reprint, 2014. **(Unit I,II and III)**
3. K S Tewari and N K Vishnoi, A Text Book of Organic Chemistry, Vikas Publishing House Pvt. Ltd., 3rd edition, 2011. **(Unit I)**

FOOD CHEMISTRY

Semester: IV **Hours: 2**

Code : 17CH4SK04 **Credits: 2**

COURSE OUTCOMES:

- Identify the role and importance of various constituents of food.
- Categorize about the spoilage of various food products.
- Apply the different methods of food preservation and safety measures in our life
- Communicate and create awareness among the public about the food adulteration and its detection.
- Develop the skill to identify the constituents of food and its nutritional values and develop equipping skills for entrepreneurship.

UNIT I: FOOD

Constituents of food - properties and significance- contamination of food, quality factors in food - appearance - flavour and texture. **(6 Hours)**

UNIT II: SPOILAGE OF FOOD PRODUCTS

Spoilage of cereals and cereal products - sugar and sugar products - vegetables - fruits-meat- fish - egg - milk dairy products - canned food - factors influencing spoilage: moisture, temperature and pH. **(6 Hours)**

UNIT III: FOOD PRESERVATION

Drying - use of high temperature and low temperature - asepsis - irradiation - chemical preservation of food - food additives: definition, types and importance. **(6 Hours)**

UNIT IV: FOOD SAFETY

Risks and hazards - food standards in marketing - Fruit Product Order (FPO), Food Safety and Standards Authority (FSSA), Bureau of Indian Standards (BIS), Agricultural Marketing (AGMARK), Indian Standard Institute (ISI) - detection of food adulteration. **(6 Hours)**

UNIT V

Hands on training for the preparation of squash, jam, pickles, ketchup, toffee, yoghurt, cheese, vadagam - fireless cooking - calorific value of some fruits - vegetables - nuts - sprouted seeds. **(6 Hours)**

COURSE BOOK:

Study material prepared by Chemistry Department.

BOOKS FOR REFERENCE:

1. M.R. Adams and M.O. Moss, Food Microbiology, New Age International Publishers, 1st edition, 1996.
2. Seemayadav, Food Chemistry, Anmol publications Pvt. Ltd., New Delhi, 1st edition, 1997.
3. James M. Jay, Modern Food Microbiology, CBS Publishers and Distributors, 4th edition, 2003.
4. George J. Banwart, Basic Food Microbiology, CBS Publishers and Distributors, 2nd edition, 1998.

ORGANIC CHEMISTRY - II

Semester: V **Hours: 6**
Code : 17CH5MC08 **Credits: 5**

COURSE OUTCOMES:

- Associate an in-depth knowledge about different mechanisms involved in various types of reactions.
- Recognize the chemistry of organic compounds having different functional groups.
- Discuss the overview of the organic reaction mechanisms, and Describe the preparation and properties of poly nuclear hydrocarbon and their derivatives.
- Explain the synthetic importance of acetoacetic and malonic esters and gain the knowledge of the hydroxyl and carboxylic compounds and their derivatives.
- Acquire knowledge about conformational analysis of organic compounds.

UNIT I: AROMATIC ALDEHYDES AND KETONES (WITH MECHANISM FOR NAMED REACTIONS)

Methods of preparation of benzaldehyde: Rosenmund's reduction, Gattermann aldehyde synthesis, Grignard reagent and Stephen's method - properties: Cannizaro, Knoevenagel, Claisen and Benzoin reactions - preparation, properties and uses of cinnamaldehyde(Perkin reaction), salicylaldehyde (Reimer Tiemann reaction) and vanillin - methods of preparation of ketones: Hoeben - Hoesch synthesis, oxidation, Grignard reagent-properties and uses of acetophenone and benzophenone - comparison of aliphatic and aromatic aldehydes. **(18 Hours)**

UNIT II: ALIPHATIC DICARBOXYLIC ACIDS

Nomenclature - general methods of preparation - acidic nature.

ACETOACETIC AND MALONIC ESTERS

Reactive methylene group - preparation and synthetic uses of acetoacetic ester and malonic ester.

ALIPHATIC NITROGEN COMPOUNDS

Diamide: preparation, properties, uses, structure and estimation of urea (Biochemical method only).

ALIPHATIC DIAZO COMPOUNDS

Preparation and synthetic importance of diazomethane and diazo acetic ester. **(18 Hours)**

UNIT III: ALICYCLIC COMPOUNDS

General preparation and properties of cycloalkanes - relative stability of cycloalkanes and Bayer's strain theory and its limitations - theory of strainless rings - Coulson and Moffit's concept of maximum overlap of carbon orbitals - preparation of large ring ketones - civetone and muscone.

CONFORMATIONAL ISOMERISM

Difference between configuration and conformation - conformational isomers- Fischer's plane projection formula - Sawhorse formula and Newmann's projection formula of ethane, 1, 2-dichloroethane, cyclohexane and mono substituted cyclohexanes. **(18 Hours)**

UNIT IV: TERPENOIDS

Definition - occurrence - isoprene rule - classification - isolation - general properties - uses - structural elucidation: citral, geraniol and menthol.

POLYNUCLEAR HYDROCARBONS AND THEIR DERIVATIVES

Isolation of naphthalene, anthracene and phenanthrene from destructive distillation of coal tar, synthesis of naphthalene (Haworth synthesis) properties - uses - substitution reactions:halogenation, nitration, sulphonation and Friedel Craft's reaction - structural elucidation of naphthalene - preparation, properties and uses of naphthols and naphthylamines - distinction between α and β - derivatives. **(18 Hours)**

UNIT V: AROMATIC HYDROXYL COMPOUNDS

Effects of substituents on acidity of phenols - comparison between phenols and alcohols - preparation and uses of picric acid, catechol, resorcinol, quinol, pyrogallol and phloroglucinol.

AROMATIC CARBOXYLIC ACIDS AND DERIVATIVES

Preparation and uses of benzoic acid, anthranilic acid, salicylic acid, methyl salicylate, mandelic acid, cinnamic acid, coumarin and phthalic acid - acidic character - effect of substituents on acidity **.** **(18 Hours)**

COURSE BOOK:

M.K. Jain, S.C. Sharma, Modern organic chemistry, Vishal publishing CO., 4th edition, 2014. **(Unit I - V)**

BOOKS FOR REFERENCE:

1. P.L. Soni and H.M. Chawla, Text Book of Organic Chemistry Sultan Chand and Sons, Reprint, 2014.
2. K.S. Tewari and N. K. Vishnoi, A Text Book of Organic Chemistry, Vikas Publishing House Pvt. Ltd., 3rd edition, 2011.
3. I.L. Finar, Organic Chemistry, volume II, Dorling Kindersley, 5th edition, 2008.
4. J.L. Norula, Name reactions in Organic Chemistry, Sultan Chand and Sons, 1979.

PHYSICAL CHEMISTRY - II

Semester: V **Hours: 6**

Code : 17CH5MC09 **Credits: 6**

COURSE OUTCOMES:

- Discuss the colligative properties of dilute solutions and determine the molar mass of the solute.
- Analyze the importance of phase rule and acquire knowledge on liquid crystals.
- Discuss chemical equilibrium and distribution law.
- Explain about classification, structure and molecular weight calculation of macromolecules.
- Explain the basic concepts of quantum mechanics and Classify the molecules into various point groups based on symmetry elements.

UNIT I: COLLIGATIVE PROPERTIES OF DILUTE SOLUTIONS

Definition - Raoult's law for vapour pressure lowering (equation only) - van't Hoff equation for calculating osmotic pressure measurement - reverse osmosis - the boiling point elevation - derivation of molal elevation constant (K_b) - determination of molar mass from boiling point elevation- freezing point depression - derivation of molal depression constant (K_f) - determination of molar mass from freezing point depression. **(18 Hours)**

UNIT II: PHASE RULE

Definition of terms - derivation of phase rule-one component system: water system and sulphur system - two component systems: simple eutectic systems - reduced phase rule - Pb-Ag system, KI-H_2O system - freezing mixtures - formation of compounds with congruent and incongruent melting point - $FeCl_3$-H_2O system, Na_2SO_4-H_2O system, $CuSO_4$-H_2O system-deliquescence and efflorescence.

LIQUID CRYSTALS

Definition - smectic, nematic and cholesteric liquid crystals - applications. **(18 Hours)**

UNIT III: CHEMICAL EQUILIBRIUM

Law of mass action - thermodynamic treatment - van't Hoff reaction isotherm, temperature dependence of the equilibrium constant - van't Hoff isochore - homogeneous equilibria - dissociation of PCl_5 - factors affecting chemical equilibrium - Le-Chatlier principle applied to Haber's process.

DISTRIBUTION LAW

Definition - conditions for the validity of the distribution law - thermodynamic derivation - verification - modification - applications. **(18 Hours)**

UNIT IV: SOLUTIONS OF NON ELECTROLYTES

Solution of liquids in liquids - Raoult's law - chemical potentials of ideal and non-ideal solutions - Gibbs - Duhem - Margules equation - fractional distillation of binary liquid systems - azeotropic mixture - steam distillation of immiscible liquids - solubility of partially miscible liquids - phenol water system - effect of impurities on critical solution temperature - solutions of gases in liquids - factors influencing solubility of a gas - Henry's law - applications of Henry's law.

MACROMOLECULES

Introduction- classification of polymers: isotactic, atactic and syndiotactic polymers - stereo regular polymers - graft polymers - addition and condensation polymerization reactions - molar masses of polymers: number average and weight average methods. **(18 Hours)**

UNIT V: INTRODUCTION TO QUANTUM MECHANICS

Introduction - state function or wave function - the Schrodinger wave equation (no derivation) - particle in a one dimensional box.

GROUP THEORY

Molecular symmetry elements and symmetry operations - products of symmetry operations - properties of a group - classes and sub groups - group multiplication table for C_2v Point groups - classification of molecules into point groups - C_{2v}, C_{3v}, $C_{2h,}$ D_{2h} D_{3h} D_{4h} D_{6h}, T_d and O_h - vector and matrix algebra - symmetry operations and transformation matrices - reducible and irreducible representations - orthogonality theorem-construction of character table for C_{2v} point group.

(18 Hours)

COURSE BOOK:

B.R. Puri, L.R. Sharma and Madan S. Pathania, Principles of Physical Chemistry, Vishal publishing Co, 47th edition, 2016, New Delhi.

BOOKS FOR REFERENCE:

1. Arun Bahl, B.S. Bahl and G.D. Tuli, Essentials of Physical chemistry, S. Chand and Company PVT. LTD. Reprint 2014.
2. K.V. Raman, Group Theory and its applications to Chemistry, Tata McGraw-Hills, 1990-reprint.

INORGANIC CHEMISTRY

Semester: V **Hours: 6**
Code : 17CH5MC10 **Credits: 6**

COURSE OUTCOMES:

- Discuss the important characteristics of non aqueous solvents.
- Explain the theories of acids and bases.
- Discuss the important compounds in first transition series and Apply the methods to prepare transition metal complexes.
- Outline the chemistry of inner transition elements.
- Describe the various aspects of coordination chemistry and Prepare some coordination compounds.

UNIT I: NON AQUEOUS SOLVENTS

Classification of solvents - properties of solvents - liquid ammonia - chemical reactions in liquid ammonia - solutions of alkali metals in liquid ammonia - liquid sulphur dioxide.

ACIDS AND BASES

Arrhenius concept - proton transfer theory - concept of Lowry and Bronsted - Lewis concept - Lux - Flood concept - the solvent - system concept. **(18 Hours)**

UNIT II: FIRST TRANSITION SERIES

Preparation, properties and uses of titanium dioxide, titanium(IV)chloride, vanadium pentoxide, potassium dichromate, potassium permanganate, potassium ferrocyanide, potassium ferricyanide, sodium nitroprusside, green vitriol, blue vitriol, verdigris and white vitriol. **(18 Hours)**

UNIT III: INNER TRANSITION ELEMENTS

Definition - electronic configurations - stable oxidation states - ionic radii - consequences and causes of contractions -differences between 4f and 5f orbitals- colour - magnetic properties of complexes - separation of lanthanides and actinides - comparison of inner transition and transition metals - preparation, properties and uses of oxides of thorium and uranium. **(18 Hours)**

UNIT IV: COORDINATION CHEMISTRY I

Double salts and coordination compounds - definitions and terminology: coordination complexes and complex ions - central ion and ligands - types of ligands - chelating ligands and chelates - coordination number and coordination sphere-charge on a complex ion - Werner's coordination theory - nomenclature of coordination compounds - Sidgwick's electronic concept - limitations - effective atomic number - stereochemistry of coordination compounds with different coordination number - structural isomerism: ionization, hydrate, coordination and linkage isomerism - stereo isomerism: geometrical and optical isomerism in complexes of coordination number 4 and 6. **(18 Hours)**

UNIT V: COORDINATION CHEMISTRY II

Valence Bond theory (VB) - octahedral: inner and outer orbital complexes, square planar and tetrahedral complexes - shortcomings of V.B theory - Crystal Field Theory (CFT) - crystal field splitting in tetragonal, square planar, tetrahedral and octahedral complexes - factors influencing the magnitude of crystal field splitting: nature of the central cation and nature of the ligand - comparison between VBT and CFT - magnetic properties of metal complexes and crystal field theory.

(18 Hours)

COURSE BOOK:

1. B.R. Puri, L.R. Sharma and K.C. Kalia, Principles of Inorganic Chemistry, Milestone publishers and Distributor, Delhi, 32nd edition, 2015. **(Unit I - V)**

BOOKS FOR REFERENCE:

1. P. L. Soni and Mohan Katyal, Textbook of Inorganic Chemistry, Sultan Chand and Sons Educational publishers, Reprint, 2014. **(Unit I - V)**
2. R.D. Madan, Modern Inorganic Chemistry, S. Chand and Company Limited, 2nd edition, 2002. **(Unit I - V)**

PRACTICAL: PHYSICAL CHEMISTRY

Semester: V **Hours: 6**

Code : 17CH5CP04 **Credits: 3**

COURSE OUTCOMES:

- ❖ Develop knowledge on conductometric titrations and potentiometric titrations
- ❖ Determine critical solution temperature and Molecular weight by Rast method
- ❖ Determine rate constant of ester hydrolysis
- ❖ Determine critical solution temperature
- ❖ Determine rate constant of ester hydrolysis

1. Determination of Molecular Weight by Rast's method
2. Phase diagram: Simple Eutectic
3. Critical Solution Temperature (CST) of phenol water system and effect of impurity (NaCl) on CST
4. Surface Chemistry: Adsorption Characteristics of Acetic Acid on Charcoal.
5. Kinetics: Determination of relative strength of acids by acid catalyzed hydrolysis of ester
6. Electrochemistry:
   i) Conductometric titration between a strong acid and a strong base
   ii) Potentiometric titration between ferrous sulphate and potassium dichromate

BOOKS FOR REFERENCE:

1. Practical manual prepared by the Chemistry Department.
2. V. Venkateswaran, R. Veeraswamy and A. R. Kulandaivelu, Basic principles of Practical chemistry, Sultan Chand and Sons, 2nd edition, 1997.

C - PROGRAMMING AND ITS APPLICATIONS TO CHEMISTRY

(Theory and Practical)

Semester: V **Hours: 4**

Code : 17CH5CE2A **Credits: 3**

COURSE OUTCOMES:

- Associate the importance and basic structure of C program.
- Identify the terms and operators in C program
- Develop knowledge about decision making and branching in C programming.
- Use the functions efficiently in C programming and Acquire knowledge about structure and unions.
- Explain about arrays and string and Gain knowledge on problem solving using C programming in chemistry.

UNIT I: TERMS IN 'C' PROGRAM

Importance of C - basic structure of C program - character set - key words and identifiers, variables - data types - declaration of variables - assigning values to variables - defining symbolic constants - operators - expression - type conversions in expression - hierarchy of operations - input and output operations - reading a character- writing a character. **(12 Hours)**

UNIT II: DECISION MAKING AND BRANCHING

Control statements: if statement - **if...else** statement - switch statement - **goto** statement.

Decision making and looping: while statement - **do** statement - **for** statement - jumps in loops. **(12 Hours)**

UNIT III: ARRAYS AND STRINGS

Arrays - introduction - one dimensional array - declaration and initialization

Arrays in Strings: declaring and initializing string variables - reading strings from terminal - writing strings to screen-putting strings together- comparison of two strings - string handling functions. **(12 Hours)**

UNIT IV: STRUCTURES, UNIONS AND POINTERS (ELEMENTARY IDEA)

Definition of a structure- declaring structure variables - accessing structure members - structure initialisation - Unions: size of structures - difference between structure and union - pointers: introduction - understanding pointers, accessing the address of a variable - declaring pointer variable - initialization of pointer variables - accessing a variable through its pointer. **(12 Hours)**

UNIT V: SOLVING PROBLEMS IN CHEMISTRY

1. Calculation of pH of a solution
2. Calculation of number of vibrational modes of linear and non-linear molecules
3. Calculation of RMS, Average and Most probable velocity
4. Conversion of centigrade to Fahrenheit and vice versa
5. Calculation of the rate constant and half life period of a first order reaction
6. Finding the ionic mobility of electrolytes **(12 Hours)**

COURSE BOOK:

Study material prepared by the Chemistry Department.

BOOKS FOR REFERENCE :

1. K. V. Raman Computers in Chemistry, Tata McGraw-Hill Publishing Company Ltd, 4thedition, 2007.
2. E. Balagurusamy, Programming in ANCI C, Tata McGraw-Hill Publishing Company Ltd, 3rd edition, 2004.

INDUSTRIAL CHEMISTRY

Semester: V **Hours: 4**

Code : 17CH5CE2B **Credits: 3**

COURSE OUTCOMES:

- Categorize the chemical processes of various industries such as cement, sugar, dyeing and match industries and their applications
- Describe about structure, preparation, properties of the polymer materials
- Discuss the commercial processes used for the refining and processing of natural gas and crude petroleum
- Describe the commercial production technology of various important petrochemicals
- Apply their knowledge for protection of different metals from corrosion and Communicate, create skills for entrepreneurship

UNIT I: SILICATE INDUSTRY

Cement: raw materials - manufacture - setting of cement - uses - glass: general properties of glasses - raw materials - manufacture - types of glasses uses - ceramics: production and uses.

POLYMERS

Addition polymer: preparation of Poly Vinyl Chloride (PVC) and uses - condensation polymer: preparation of nylon 66 and uses - plastics: types - distinction between thermoplast and thermosets - preparation of bakelite and uses - fibres: classification - distinction between natural and synthetic fibres - preparation of Teflon - Rubber: types - vulcanization - preparation of buna-s - rubber and uses. **(12 Hours)**

UNIT II: PETROCHEMICALS

Origin - classification - composition - chemicals from natural gas, petroleum, light naphtha and kerosene - synthetic gasoline.

CORROSION

Corrosion of metals - disadvantages - various forms of corrosion: general corrosion, localized corrosion, intergranular corrosion, galvanic corrosion and biological corrosion - methods of preventing corrosion: galvanizing, tinning, electroplating, cathodic protection and painting-corrosion inhibitors. **(12 Hours)**

UNIT III: SUGAR INDUSTRY

Introduction - extraction of juice - purification - defecation - sulphitation and carbonation - concentration - crystallization - separation of crystals - refining.

DYEING INDUSTRY

Introduction - sensation of colors - fibres to be dyed - basic operations in dyeing - formation of dye on the fibre. **(12 Hours)**

UNIT IV: MATCH INDUSTRY

Raw materials - manufacturing processes - uses.

PAPER INDUSTRY: raw materials - manufacturing process - bleaching - coloring - uses.

PHOTOGRAPHY AND PRINTING INDUSTRIES

Photographic processes - preparation of sensitive plates - exposure - developing - fixing - printing - toning - colour photography - basic principles of offset printing. **(12 Hours)**

UNIT V: FERTILIZERS

Definition - nutrients for plants - role of various elements in plant growth - natural and chemical fertilizers - classification of chemical fertilizers - manufacture of urea- mixed fertilizers - organic farming.

SOAPS AND DETERGENTS

Composition - manufacture of soap - synthetic detergents - cleansing action of soap and detergent. **(12 Hours)**

COURSE BOOKS:

1. P. L. Soni and Mohan Katyal, Textbook of Inorganic chemistry, Sultan Chand and Sons Educational publishers, Reprint, 2014. **(Unit I)**
2. B. K. Sharma, Industrial Chemistry, Goel publishing house, Meerut 14th edition, 2008.
3. P. C. Jain and Monica Jain, Engineering Chemistry, Dhanpat Rai Publishing Company, 12th edition, 1998.

DAIRY CHEMISTRY

Semester: V **Hours: 4**

Code : 17CH5CE2C **Credits: 3**

COURSE OUTCOMES:

- Acquire knowledge about composition of milk and milk products
- Gain knowledge on the processing of milk
- Explain the methods of analysis in milk adulteration
- Describe the composition to prepare milk products
- Analyze milk and milk products and Demonstrate the analysis of milk and milk products

UNIT I: COMPOSITION OF MILK

Milk: Definition-composition - minor components of milk: salts and ash- trace elements - radioactive trace elements and gases - other components of milk: flavoring substances, phospholipids, sterols, carbohydrates other than lactose, vitamins and pigments-milk grades-constituents of milk: lipids, proteins, carbohydrates, vitamins and minerals- types of milk and milk products.**(12 Hours)**

UNIT II: PROCESSING OF MILK

Microbiology of milk - destruction of micro-organisms - physic - chemical changes - types of pasteurization: bottle - batch - High Temperature Short Time - Ultra High Temperature pasteurization. **(12 Hours)**

UNIT III: MILK ADULTERATION

Special tests - cane sugar - Gelatin and calcium sucrate - preservatives - pasteurized milk - composition of milk - standard milk - detection of skimmed milk cream - forms of adulteration - methods of analysis - homogenized cream- reconstituted cream - condensed milk. **(12 Hours)**

UNIT IV: COMPOSITION OF MILK PRODUCTS

Introduction - Market milk - fermented milks -market cream- butter- butter oils - spreads - concentrated milk products - dried milk products - cheese - frozen desserts - casein - lactose - whey - specialty products. **(12 Hours)**

UNIT V: ANALYSIS OF MILK AND MILK PRODUCTS

Determination: total solids, total acidity and lactose - Physical properties of milk: colour - odour - acidity - specific gravity - viscosity and conductivity. **(12 Hours)**

BOOKS FOR REFERENCE :

1. Webb Johnson and Alford, Fundamentals of Dairy Chemistry, CBS Publishers & Distributors, 2nd edition, 1987. **(UNIT I & IV)**
2. B. Sivasankar, Food processing & preservation, Prentice-Hallmof India Pvt.Ltd., 3rd edition, 2005**. (UNIT I)**
3. A.G. Woodman, Food Analysis, Axis Books (India), 1st edition, 2010. **(UNIT I & III)**
4. Kavitha Marwaha, Food Process Engineering, Gene-Tech Books, 2010. **(UNIT II)**
5. Alex V. Ramani, Food chemistry, MJP Publishers, 2009. **(UNIT V)**

GREEN CHEMISTRY

Semester: V **Hours: 4**

Code : 17CH5CE2D **Credits: 3**

COURSE OUTCOMES: (outcomes க்கும் core elective ல் உள்ள outcomes க்கும் Different இருக்கு)

- ❖ Recognize the impact of green chemistry on human health and environment
- ❖ Apply the principles of green chemistry to carry out the practicals in microscale level
- ❖ Demonstrate green reactions to have sustainable environment
- ❖ Apply green procedures in the lab
- ❖ Utilize green methods in everyday life

UNIT I: GREEN CHEMISTRY

Definition - introduction - industry efforts - green chemistry curriculum - objectives - demand for green chemistry - need for green chemistry - metathesis: example - principles of green chemistry. **(12 Hours)**

UNIT II: ATOM ECONOMY

Concept of atom economy - pharmaceuticals - pesticides - polymers - computer chips - dry cleaning - avoiding waste - efficiency of reaction - atom economy in substitution and elimination reactions. **(12 Hours)**

UNIT III: MATERIALS AND METHODS IN GREEN SYNTHESIS

Tools - green starting materials - characteristics of green catalysts - example - green reactions: oxidation reaction - ruthenium catalyst - palladium catalyst - nickel catalyst. **(12 Hours)**

UNIT IV: ALTERNATIVE GREEN PROCEDURES

Organic Preparations: Acetylation - aldol condensation - Diels-Alder reaction - green photochemical reaction - microwave assisted synthesis - knoevenagal reaction.

Synthesis of Green Reagents: Tetrabutylammonium tribromide (TBATB)- application - preparation of ionic liquid - application. **(12 Hours)**

UNIT V: APPLICATIONS OF GREEN CHEMISTRY

Green analysis: Green guidelines - suggestions - organic qualitative analysis- detection of elements - derivative of carboxylic acid - inorganic analysis - physical chemistry experiments - green chemistry in everyday life. **(12 Hours)**

COURSE BOOK:

J.N. Gurtu and Amit Gurtu, Green Chemistry, Pragati Prakashan Educational Publishers, 1st edition, 2012. **(UNIT I - V)**

BOOKS FOR REFERENCE:

1. V. K. Ahluwalia, Green Chemistry Environmentally Benign Reaction, Ane Books Pvt. Ltd., Reprint 2009.
2. Rashmi Sanghi and M. M. Srivastava, Green Chemistry Environment Friendly Alternatives, Narosa Publishing House Pvt.Ltd., Fifth Reprint 2012.

APTITUDE BUILDING - I

Semester: V **Hours: 2**

Code : 17AE5NE01 **Credits: 2**

COURSE OUTCOMES:

- Understand the basic concepts of numerical ability.
- Gain mastery over logical reasoning through concise thinking.
- Have command over English Language.
- Acquaint with general knowledge and current affairs.
- Develop sufficient confidence to face competitive exams and clear it.

UNIT I

Numerical Ability: Numbers - Highest common factor & Least common multiple of numbers - average - Problems on numbers - percentages - Problems on ages - Percentage - Profit and loss - ratio and proportion - Time & work.

UNIT II

Reasoning: Series completion - analogy - coding & decoding - puzzle test - direction sense test - alphabet test - alpha - numeric sequence puzzle - arithmetic reasoning - inserting missing character - logical sequence of words.

UNIT III

English Language: Spotting errors: Articles, Tenses, Nouns, Pronouns, Adjectives, adverbs, Prepositions - Selecting the most suitable word - Synonyms, Antonyms - Spell check - Double blanks in a sentence.

UNIT IV

General knowledge: Computer awareness: Classification, Elements of computing process, Programming languages, Computer memory, Software & Hardware, Operating systems - Banking awareness: Banking Regulation act, Reserve Bank of India, Commercial banks, e-banking, Currency system, Money Market, Banking and Finance, Indian Monetary Policy.

UNIT V

Current affairs: National & International Current Affairs: Economy, Sports, Science & Technology, Polity.

COURSE BOOK:

Course Material prepared by the Staff.

BOOKS FOR REFERENCE:

1. IBPS - VI, Institute of Banking Personnel Selection, Bank Po, Probationary officers/Management trainees Arihant Publications (India) Limited, 2015.
2. A.P. Bhardwaj, General English for Competitive Examinations, Dorling Kindersley (India) Pvt Ltd, New Delhi, 2013.
3. Dr. R.S. Aggarwal, Quantitative Aptitude, S.Chand & Company PVT.LTD, New Delhi, 2013.
4. Dr. R.S. Aggarwal, A Modern Approach to Verbal & Non - Verbal Reasoning, S. Chand & Company PVT.LTD, New Delhi, 2009.

ORGANIC CHEMISTRY - III

Semester: VI **Hours: 6**

Code : 17CH6MC11 **Credits: 6**

COURSE OUTCOMES:

- Associate an in-depth knowledge about molecular rearrangements
- Explain the concepts of the biological importance and applications of heterocyclic compounds
- Discuss the mechanism of some named Reactions
- Recognize the importance of aromatic compounds, and Gain knowledge on colour and constitution of dyes
- Generate knowledge on alkaloids and carbohydrates and Formulate the medicinal terms of drugs and diseases

UNIT I: MOLECULAR REARRANGEMENTS

Definition - types: cationotropic, anionotropic, free radical migration - inter and intra molecular rearrangement - definition, example and detailed mechanism of the following: Beckmann, Benzidine, Benzil - Benzilic acid, Claisen, Fries, Hofmann, Pinacol - Pinacolone rearrangement.

DYES

Colour and constitution - characteristics and classification of dyes - preparation and uses of malachite green, methyl orange and phenolphthalein. **(18 Hours)**

UNIT II: AROMATIC SULPHONIC ACID

Preparation, properties and uses of sulphonyl chloride, saccharin, chloramin-T and dichloramin-T.

AROMATIC AMINO COMPOUNDS

Preparation and uses of aniline, diphenylamine, N,N - dimethylaniline, diamines, Michler's ketone and acetanilide - distinction between primary, secondary and tertiary amines basicity - effects of substituents on basic characteristics - comparison between aliphatic and aromatic amino compounds.

AROMATIC NITRO COMPOUNDS

Reduction products of nitro compounds - preparation, properties and uses of Tri Nitro Toluene (TNT).

AROMATIC DIAZONIUM SALTS

Preparation, properties and synthetic importance of benzene diazonium chloride.

(18 Hours)

UNIT III: CARBOHYDRATES

Introduction - definition - classification - reducing and non - reducing sugars - configuration of aldotriose and aldopentoses. Monosaccharides - chemical properties of glucose and fructose - structural elucidation of glucose - open - chain structure - limitations - ring structure of D(+) glucose - ring size - Haworth projection formulae - α - and β- D(+) glucose - epimer and epimerization - interconversion of glucose and fructose - The Kiliani-Fischer Synthesis (ascending the series of aldoses) - Wohl degradation (descending the aldose series) - disaccharides - sucrose (structure only) - inversion of sucrose - uses - polysaccharides - starch and cellulose (structure only)- uses. **(18 Hours)**

UNIT IV: ALKALOIDS

Introduction - nomenclature and classification - occurrence - general properties- isolation - general structure determination - structural elucidation of piperine, coniine and nicotine. **(18 Hours)**

UNIT V: HETEROCYCLIC COMPOUNDS

Definition - classification - nomenclature and general characteristics - acidic and basic character - preparation, properties and uses of furan, thiophene, pyrrole, pyridine, quinoline, isoquinoline - synthesis and structural elucidation of quinoline.

AROMATIC HALOGEN COMPOUNDS

Preparation and uses of chlorobenzene, benzyl chloride, Benzene Hexa Choride (BHC) and Dichloro Diphenyl Trichloroethane (DDT)- Reactivity of aryl halides - comparison of nuclear and side chain halogen derivatives. **(18 Hours)**

COURSE BOOK:

M.K. Jain and S.C. Sharma, Modern Organic Chemistry, Vishal Publishing Co., 4th edition, 2014. **(Unit I - V)**

BOOKS FOR REFERENCE:

1. P.L. Soni and H.M. Chawla, COURSE BOOKS of Organic Chemistry, Sultan Chand and Sons Pvt., Reprint, 2014.
2. K.S. Tewari and N.K. Vishnoi, A COURSE BOOKS of Organic Chemistry, Vikas Publishing House Pvt. Ltd., 3rd edition, 2011.
3. V.K. Ahluwalia, Organic Reaction Mechanisms, Narosa Publishing House, 4th edition, Reprint, 2014.

PHYSICAL CHEMISTRY - III

Semester: VI **Hours: 6**

Code : 17CH6MC12 **Credits: 6**

COURSE OUTCOMES:

- Associate the various types of electrolytic conductance to concentration
- Discuss the application of electromotive force, electrodes and commercial cells
- Apply the different terms involved in ionic equilibrium to physical chemistry practicals
- Recognize the crystal structure and X-ray diffraction of solids and identify the crystal defects in solids
- Manipulate the third law of thermodynamics and thermo chemistry for calculation of entropy of solids

UNIT I: ELECTROCHEMISTRY

Electrolytic conductance - specific, equivalent and molar conductance - cell constant - variation of molar conductance with dilution - transport number and its determination (moving boundary method) - ionic mobility - Kohlrausch's law and its applications - temperature dependence of ionic conductance - applications of measurement of conductance - conductometric titrations - Ostwald's dilution law - Debye - Huckel theory of strong electrolytes (no derivation) - activity co-efficient - mean activity co-efficient **(18 Hours)**

UNIT II: IONIC EQUILIBRIA

Ionic product of water - pH scale - common ion effect - buffer solutions - buffer mixture of weak acid and its salt - weak base and its salt - calculation of pH values of buffer mixtures - Henderson-Hasselbalch equation - hydrolysis of salts -degree of hydrolysis: salts of weak acid and strong base - strong acid and weak base - weak acid and weak base - determination of degree of hydrolysis - indicators: theory of acid - base indicators - action of phenolphthalein and methyl orange - acid base titrations: titration of a strong acid against a strong base - weak acid with strong base - weak base with strong acid - solubility product - molar solubility of a sparingly soluble salt- applications of solubility product. **(18 Hours)**

UNIT III: ELECTROMOTIVE FORCE OF GALVANIC CELLS

Galvanic cells - electrolytic and electrochemical cells - some common type of reversible electrodes: metal - metal ion electrodes, hydrogen electrode, calomel electrode and oxidation reduction electrode - single electrode potential - Nernst equation - conventional standard electrode potential - cell reactions - cell potentials - activity and mean ionic activity of an electrolyte - concentration cells: classification - derivation of emf of concentration cells with transference- liquid junction potential - commercial cells - lead storage cell - applications of emf measurements : Determination of pH using glass and quinhydrone electrode - potentiometric titrations - oxidation -reduction indicators - over voltage - applications: electro deposition of metals in aqueous solutions - corrosion of metals. **(18 Hours)**

UNIT IV: CRYSTALLINE STATE

Introduction - classification of solids - difference between crystalline and amorphous solids - symmetry - interfacial angle - point groups - space lattice and unit cell - Bravais lattices-seven crystal systems - law of rationality of indices and Miller indices - X-ray diffraction and crystals structure - Bragg's equation - ionic crystals - structure of sodium chloride and CsCl- covalent crystals - structure of diamond and graphite - lattice energy of an ionic crystal-Born Lande equation - Madelung constant - Born Haber's cycle - crystal defects in stoichiometric and non-stoichiometric crystals - energy band theory of conductors, semiconductors and insulators. **(18 Hours)**

UNIT V: THIRD LAW OF THERMODYNAMICS

Nernst heat theorem - definition - third law of thermodynamics - exception - determination of absolute entropies of solids and gases - Zeroeth law of thermodynamics: definition - absolute scale of temperature.

THERMO CHEMISTRY

Definition - change of internal energy and enthalpy in a chemical reaction - enthalpy of combustion, formation, neutralization and precipitation - Kirchoff's equation - Hess's law of constant heat summation - applications: - calculation of bond energy from thermo chemical data. **(18 Hours)**

COURSE BOOK:

B.R. Puri, L.R. Sharma and Madan S. Pathania, Principles of Physical Chemistry,. Vishal Publishing Co, New Delhi, 47th edition, 2016. **(**Unit **I- V)**

BOOK FOR REFERENCE:

Arun Bahl, B.S. Bahl and G.D. Tuli, Essentials of Physical chemistry, S. Chand and Company Pvt. Ltd. Reprint 2014.

INORGANIC AND ANALYTICAL CHEMISTRY

Semester: VI **Hours: 6**

Code : 17CH6MC13 **Credits: 5**

COURSE OUTCOMES:

- Discuss the chemical processes involved in polymerization
- Evaluate the biological importance of some metals
- Outline the basic principles of gravimetric analysis
- Apply the various methods to minimize errors during analysis
- Demonstrate thermal analysis and chromatography techniques

UNIT I: INORGANIC POLYMERS

Inorganic polymers: general properties - glass transition temperature - phosphorous based chain polymers: polyphosphazine, polyphosphonitrilic chlorides - sulphur based polymers: polymericsulphur, polymericsulphur nitride - boron based polymers: polymeric boron nitride - silicon based polymers: silicone rubber - coordination polymers: polymers with cyclopentadienyl rings, polymers with bis chelating agents. **(18 Hours)**

UNIT II: BIOINORGANIC CHEMISTRY

Role of Na/K (sodium pump), Mg/Ca (calcium pump), iron, cobalt, copper and zinc in biological systems- structure and functions of chlorophyll, myoglobin, haemoglobin, vitamin $B_{12,}$ blue copper proteins, superoxidedismutase, carboxy peptidase A and carbonic anhydrase - toxification of copper and iron - detoxification of copper and iron using chelating agents. **(18 Hours)**

UNIT III: PRINCIPLES OF GRAVIMETRIC ANALYSIS

Introduction - precipitation methods - supersaturation and precipitate formation- the purity of the precipitate: co - precipitation - post precipitation - conditions of precipitation - precipitation from homogeneous solution- washing of the precipitate - organic precipitants: dimethylglyoxime, cupferron, oxine and cupron.

ERROR ANALYSIS

Errors: types of errors - absolute and relative error- correction of determinate errors - precision and accuracy: definition and difference - calculation of mean and standard deviation - significant figures. **(18 Hours)**

UNIT IV: THERMAL ANALYSIS

Thermogravimetry - introduction - instrumentation - applications - Differential Thermal Analysis (DTA) and Differential Scanning Calorimetry (DSC) - instrumentation for DTA and DSC - experimental and instrumental factors - applications of DTA and DSC. **(18 Hours)**

UNIT V: CHROMATOGRAPHY

Introduction - classification - Thin Layer Chromatography (TLC) - Paper Chromatography - Column Chromatography - High Performance Liquid Chromatography (HPLC) - Gas Chromatography (GC): introduction and instrumentation. **(18 Hours)**

COURSE BOOKS:

1. B.R. Puri, L.R. Sharma and K.C. Kalia, Principles of Inorganic Chemistry, Milestone Publishers and Distributors, Delhi, 32nd edition, 2015. **(Unit I -III)**
2. G.H. Jeffery, J. Bassett, J. Mendham and R.C. Denney, A COURSE BOOKS of Quantitative Inorganic Analysis including elementary instrumental analysis, ELBS publishers, 4th edition, 1978. **(Unit III and IV)**
3. V.K. Srivastava, K.K. Srivastava, Introduction to Chromatography, S. Chand and company Ltd., 3rd edition,1985. **(Unit V)**

BOOKS FOR REFERENCE:

1. P.L. Soni, M. Katyal, Test book of Inorganic Chemistry, Sultan Chand and Sons, Reprint, 2015.
2. Chatwal Anand, Instrumental methods of chemical analysis, Himalaya Publishing House, 2nd edition, 1984.
3. E. Huheey, James, Inorganic Chemistry Principles of structure and reactivity, Dorling Kindersley India Pvt. Ltd, 4th edition, 2007.
4. J. Mendham, R C Denney, J. D. Barnes and M. J. K. Thomas, Vogel's Textbook of Quantitative Chemical Analysis, Pearson Education Ltd, Reprint, 2005.

PRACTICAL: GRAVIMETRIC ESTIMATION AND INORGANIC PREPARATION

Semester: VI **Hours: 6**

Code : 17CH6CP05 **Credits: 3**

COURSE OUTCOMES:

- Acquire the knowledge of preparation of inorganic complexes
- Realize the basics of precipitation reactions
- Apply the practical skills for synthesis and purification
- Demonstrate the methods of precipitation and filtration
- Equip with empirical and quantitative skills

I GRAVIMETRIC ESTIMATION

A) USING SINTERED CRUCIBLE

Estimation of

1. Lead as lead chromate
2. Barium as barium chromate
3. Calcium as calcium oxalate

B) USING SILICA OR PORCELAIN CRUCIBLE

Estimation of

4. Calcium as calcium oxide
5. Water of hydration in a hydrated salt ($BaCl_2$)
6. Barium as barium sulphate

PREPARATION OF COMPLEXES

1) Preparation of ferrohexacyanoferrate (III) complex
2) Preparation of tetrammine copper (II) sulphate tetra hydrate
3) Preparation of tris - (thiourea) - copper (II) sulphate dihydrate

BOOK FOR REFERENCE:

V.Venkateswaran, R. Veeraswamy and A. R. Kulandaivelu, Basic principles of Practical Chemistry, Sultan Chand and Sons, 2nd edition, 1997.

SPECTROSCOPY AND ITS APPLICATIONS

Semester: VI **Hours: 4**

Code : 17CH6CE3A **Credits: 3**

COURSE OUTCOMES:

- Gain knowledge on basic principles of spectroscopy
- Explain the theory and principles of vibrational spectroscopy and its techniques
- Comprehend the basics of Raman and their instrumentation techniques
- Explain the basic concepts in NMR with focus on chemical shift, shielding and deshielding and spin-spin splitting
- Analyze the physical properties and the structural features and apply spectral techniques in solving structural problems

UNIT I: MICROWAVE SPECTROSCOPY

Introduction to spectroscopy - regions of spectrum- basic features of spectrometers - natural line width collision broadening and Doppler broadening - molecular spectra: Born - Oppenhemier approximation - microwave (rotational) spectra: derivation of energy of diatomic molecules - energy level diagram- relative intensities of rotational spectral lines - applications - use of microwave oven. **(12 Hours)**

UNIT II: VIBRATIONAL (INFRARED) SPECTRA

Introduction - vibrational spectra of diatomic molecules - force constant - zero point energy - anharmonicity - rotation vibration spectra of diatomic molecules - vibrational frequencies of different functional groups: finger print region - applications of FT - IR spectroscopy: distinction between two types of hydrogen bonding - study of keto-enol tautomerism and conformational analysis. **(12 Hours)**

UNIT III: RAMAN SPECTROSCOPY

Introduction - quantum theory of Raman scattering - classical theory of Raman scattering - rotation - vibration Raman spectrum - experimental Raman spectroscopy - comparison between IR and Raman spectroscopy. **(12 Hours)**

UNIT IV: UV- VISIBLE SPECTROSCOPY

Electronic transitions in a diatomic molecule - Frank - Condon principle - electronic energy levels and transitions - shifts in the absorption maxima - effect of conjugation - Woodward Fieser rules for calculating absorption maximum (λ_{max}) in dienes and α - β unsaturated carbonyl compounds - applications of UV spectroscopy. **(12 Hours)**

UNIT V: NMR SPECTRA

Introduction - nuclear spin and mass number - nuclear magnetic moment - splitting of nuclear energy levels - NMR frequency - Larmor precession of a nucleus in a magnetic field - experimental technique of NMR spectroscopy - chemical shift - TMS - shielding and deshielding of protons - factors affecting chemical shift: inductive effect , van der Waals deshielding, anisotropic effects , hydrogen bonding - spin - spin splitting - coupling constant - NMR spectrum of ethanol - applications of NMR spectroscopy. **(12 Hours)**

COURSE BOOKS:

1. B.R. Puri, L.R.Sharma and Madan S.Pathania, Principles of Physical chemistry, Vishal Publishing Co. 47th edition, 2016. **(Unit I-V)**
2. M. K. Jain, S. C. Sharma, Modern Organic Chemistry, Vishal Publishing Co., 4th edition, 2014. **(Unit IV and V)**

BOOKS FOR REFERENCE:

1. C. N. Banwell and E. M. Mccash, Fundamentals of Molecular Spectroscopy, Tata McGraw-Hill Pvt. Ltd, 4th edition.
2. Y. R. Sharma, Elementary Organic Spectroscopy, Sultan Chand and Sons reprint, 1st edition, 2011.

NANO CHEMISTRY

Semester: VI **Hours: 4**

Code : 17CH6CE3B **Credits: 3**

COURSE OUTCOMES:

- Acquire knowledge on fundamentals of nanomaterials
- Describe principles of nanoparticle preparation and modification
- Analyse the special risks pertaining to nanochemistry and provide perspectives on future nanochemistry developments
- Evaluate nanotechnology, the necessary foundation for training in research
- Insight into the latest development in nanochemistry and nanotechnology

UNIT I: PREPARATION OF NANOMATERIALS

Definition of nanomaterials and nanotechnology - size dependent properties of nanomaterials - alternate approaches for the preparation of nanomaterials - synthetic strategies - gas phase evaporation method - matrix isolation technique - sol-gel processing. **(12 Hours)**

UNIT II: PROPERTIES OF NANOMATERIALS

Formation of dangling bonds - atom like behaviour of nanoparticles - physicochemical properties - optical properties - electrical and electronic properties. **(12 Hours)**

UNIT III: NANOMATERIALS IN COMMUNICATION SECTOR

Nanotechnology in electronic communication and informatics - semiconductor lasers- light emitting diode materials - wireless communication - lithography.

(12 Hours)

UNIT IV: NANOMATERIALS IN POLLUTION ABATEMENT

Pollution abatement - sensors - green nanotechnology - environmental monitoring and purification through smart particles - nanoscale-biopolymers - nanomaterials as catalysts in green manufacturing. **(12 Hours)**

UNIT V: NANOMATERIALS IN DEFENSE SECTOR

Chemical and biological warfare agents - nanomaterials based detection methods - protection and decontamination through nanomaterials. **(12 Hours)**

COURSE BOOK:

B.Viswanathan, Nano materials, Narosa publishing house, New Delhi, 1st edition, 2009. **(Unit I- V)**

BOOKS FOR REFERENCE:

1. S. Shanmugam, Nanotechnology, MJP Publishers, 2016.
2. M. A. Shah and Tokeer Ahmad, Principles of Nanoscience and Nanotechnology, Narosa Publishing House, 2nd Reprint, 2013.

FUEL CHEMISTRY

Semester: VI **Hours: 4**

Code : 17CH6CE3C **Credits: 3**

COURSE OUTCOMES:

- Discuss the various energy sources and their applications.
- Classify the various types of fuels.
- Recognise the applications of fuels.
- Gain knowledge on chemistry of biofuels .
- Discuss the applications of fuels.

UNIT I: ENERGY SOURCES

Renewable energy sources :solar, wind and geothermal energy- bioenergy- hydropower and ocean energy - non-renewable energy sources : fossil fuels and nuclear fuels - definition and examples

Fuel - definition - calorific value - determination of calorific value - classification of fuels: primary- secondary - criterion for selection of fuel - properties : ignition temperature- flame temperature- flash point- fire point. **(12 Hours)**

UNIT II: SOLID FUELS

Natural - artificial - industrial solid fuels - Coal: formation - properties - classification - coking- non coking and pulverisation coal- role of sulphur and ash in coal - analysis of coal: proximate - ultimate - advantages and disadvantages of solid fuels - fractional distillation of coal tar - uses of coal tar based chemicals.

(12 Hours)

UNIT III: LIQUID FUELS

Petroleum and petrochemicals - refining of petroleum - composition and uses of main petroleum fractions- cracking - thermal - catalytic cracking - advantages - octane rating - anti knock agents - unleaded petrol - cetane rating - antidiesel knock agents - hydrocarbons from petroleum- petrochemicals - direct and indirect petrochemicals - catalysts used in petroleum industry. **(12 Hours)**

UNIT IV: GASEOUS FUELS

Classification : natural - artificial gaseous fuels- examples and their importance - water gas - producer gas - semi water gas - LPG - manufacture - composition and uses- (Gobar gas) - biogas generation-advantages and disadvantages. **(12 Hours)**

UNIT V: BIO FUELS

Definition- sources and classification: biodiesel- bioethanol- hydrogen fuel from biomass- uses manufacture of biodiesel- advantages of biofuels. **(12 Hours)**

BOOKS FOR REFERENCE:

1. B.K. Sharma, Industrial Chemistry, Goel Publishing House, 13th Edition, 2002. **(UNIT I - IV)**
2. P.C. Jain & Jain, Engineering Chemistry, Dhanpat Rai Publishing Company (P) LTD, 12th Edition, 1998. **(UNIT I - IV)**

WEB RESOURCES:

1. https://en.m.wikipedia. Org/wiki/Biofuels. **(UNIT V)**
2. https://www.studentenergy.org/topics/biofuels. **(UNIT V)**

SOIL AND AGRICULTURE CHEMISTRY

Semester: VI **Hours: 4**

Code : 17CH6CE3D **Credits: 3**

COURSE OUTCOMES:

- Realize the composition of soil and its importance to agriculture
- Demonstrate the properties of soil
- Discuss the various types of micronutrients needed to the soil
- Analyse the chemical composition of fertilizer and soil
- Formulate the methods of analyzing the soil

UNIT I: SOIL COMPONENTS

Definition - volume, composition - uses - mineral soil - chemical ions - soil colloids - importance - nature - properties of inorganic and organic soil colloid -general characteristics - properties and importance - types - silicate clays - silicates - silicon oxygen tetrahedron. **(12 Hours)**

UNIT II: SOIL SALINITY AND ALKALINITY

Saline and alkaline soil - nature - classification - characteristics - formation of saline and alkaline soil - effects - quality of irrigation water: introduction - criteria - irrigation water resources - water quality - classification of water. **(12 Hours)**

UNIT III: FERTILIZERS

Introduction - methods of applying fertilizers - application of fertilizer in solid form - liquid fertilizer - nitrogenous fertilizer - types - phosphatic fertilizers: forms - classification- potassic fertilizers: Potassium sulphate: production - properties **(12 Hours)**

UNIT IV: BIOFERTILIZERS

Soil biota in sustainable agriculture - biodiversity - management strategies - comparison of chemical fertilizer and biofertilizer.

Vermicomposting - economic implications - materials - preliminary treatment - types of Vermicomposting - requirements for Vermicomposting.

Eco-Friendly Farming System: organic farming- concept - options **(12 Hours)**

UNIT V: ANALYSIS OF SOIL

i) Estimation of Ca, Mg, K

ii) Analysis of soluble salt.

iii) Analysis of NPK in fertilizer.

iv) Determination of soil pH and electrical conductivity.

v) Estimation of organic matter content of soil. **(12 Hours)**

COURSE BOOKS:

1. Shivanand Tolanur, Soil Chemistry, International Book Distributing Co., 1st edition, 2006. **(UNIT I and II)**
2. P.K. Gupta, A Handbook of Soil, Fertilizer and Manure, Agrobios (India), 2nd edition, 2012. **(UNIT III and IV)**
3. A. K. Mani, R. Santhi and M. Sellamuthu, A Handbook of Laboratory Analysis, AE Publication, Coimbatore, 2007. **(UNIT V)**

BOOKS FOR REFERENCE:

1. S. P. Majumdar and R. A. Singh, Analysis of Soil Physical Properties, Agrobios (India), 2012.
2. Pooja Kashyap, Agricultural Chemistry, Rajat Pubublications, New Delhi, 1st Published, 2009.

APTITUDE BUILDING - II

Semester: VI **Hours: 2**

Code : 17AE6NE02 **Credits: 2**

COURSE OUTCOMES:

- Understand the concepts of numerical ability other than basic.
- Gain mastery over logical reasoning through concise thinking to advanced level.
- Have good command over English Language.
- Acquaint with general knowledge and current affairs with complete framework.
- Develop sufficient confidence to face advanced level competitive exams and clear it.

UNIT I

Numerical Ability: Time and distance - problems on trains - simple interest - compound interest - area - probability - true discount - bankers' discount - data interpretation - tabulation - bar charts - pie charts.

UNIT II

Reasoning: Logic - statements & arguments, statement & assumptions, statement & course of action - statement & conclusions - deriving conclusions from passage.

UNIT III

English Language: Choosing the appropriate filler - Phrase substitution - Ordering of jumbled sentences - Cloze test / Passages - Comprehension passages.

UNIT IV

General knowledge: Educational institutions - National days & awards - Indian freedom struggle - Books & Authors - Who's Who.

UNIT V

Current affairs: National & International affairs: Economy, Sports, Science & Technology, Polity.

COURSE BOOK:

- Course Material prepared by the Staff.

BOOKS FOR REFERENCE:

1. IBPS - VI, Institute of Banking Personnel Selection, Bank Po, Probationary officers / Management trainees Arihant Publications (India) Limited, 2015.
2. A.P. Bhardwaj, General English for Competitive Examinations, Dorling Kindersley (India) Pvt. Ltd, New Delhi, 2013.
3. Dr. R.S. Aggarwal, Quantitative Aptitude, S. Chand & Company PVT. LTD, New Delhi, 2013.
4. Dr. R.S. Aggarwal, A Modern Approach to Verbal & Non - Verbal Reasoning, S. Chand & Company PVT. LTD, New Delhi, 2009.

CHEMISTRY IN DAILY LIFE

Semester: VI **Credits: 2**

Code : 17CH6SS01

COURSE OUTCOMES:

- Discuss the importance of chemistry.
- Apply the concept of preservation of foods in real life context and Discuss the concept of forensic chemistry and analytical tools in crime detection.
- Discuss the role of enzymes in metabolism.
- Recognize the chemistry of household products and Utilize the natural resources of energy and fuels.
- Generate knowledge in safe- handling of chemicals and aware the uses of cosmetics in their day today life.

UNIT I: IMPORTANCE OF CHEMISTRY

Oldest and newest science - widespread of chemistry and chemicals

CHEMICALS OF LIFE

Origin of life - chemistry and nutrition - chemistry and diet - water: fundamental substance of life - elementary idea of proteins, carbohydrates, nucleic acids, fats, vitamins, minerals and hormones

UNIT II: PRESERVATION OF FOODS

Food additives: coloring agents, flavouring agents and preservatives - beverages: chemical drinks - food safety.

BIOCATALYSTS

Role of enzymes in metabolism - industrial applications: food industry, milk products, consumer products and pharmaceutical industry.

UNIT III: CHEMISTRY IN HOUSEHOLD PRODUCTS

Major classes of household chemicals - cleaners - household pesticides - stain removers - fire extinguishers.

HANDLING CHEMICALS

Classification of Hazards - explosions - combustion - toxicity and poisons - radioactive chemicals - corrosive chemicals - safety in storage of chemicals.

UNIT IV: CHEMISTRY OF COSMETICS

History of cosmetics - formulations - skin care - hair care - deodorants and antiperspirants - colour cosmetics: lipstick, mascara, eye shadow and eyebrow pencils - sun protection -aerosols - nail cosmetics - mouth cosmetics.

PERFUMES, FLAVOURS AND SPICES

Constituents of perfumes: vehicle solvent, fixatives and odouriferous elements - synthetic, semi synthetic chemicals, natural products and aroma chemicals - flavours : food acceptance, taste, odour and flavor materials - uses of spices.

UNIT V: ENERGY AND CHEMISTRY

Fuel - fossil fuel : petroleum and oil, coal, natural gas - nuclear energy - solar energy - water energy - wind energy - energy from biomass and garbage.

CHEMISTRY AND LAW

Chemistry and law - forensic chemistry - drugs in sports - crime detection - physical marks - analytical tools in crime detection.

BOOKS FOR REFERENCE:

1. Kirpal Singh, Chemistry in daily life, Third Edition, PH1 Learning Private Limited, New Delhi, 2012. **(Unit I-V)**
2. K.H. Davis and F.S. Berner, Hand book of Industrial chemistry Volume I, First Edition, CBS publishers and Distributors, New Delhi, 2004. **(Unit III)**
3. K.H. Davis and F.S. Berner, Handbook of Industrial Chemistry Volume II, First Edition CBS publishers and Distributors, New Delhi, 2004. **(Unit IV)**

QUESTION PATTERN

Self Study Paper for III B.Sc. Chemistry - Chemistry in Daily Life

Blue print of question paper (External)

Time 3 hours **Max.Marks: 100**

Part	Types of Question	Number of Qns.	Number of Qns. to be answered	Marks for each Qns.	Total
Part A-I Q. No(1-5)	One from each unit (Objective Type)	5	5	1	5
Part A-II Q. No(6-10)	One from each unit (Fill in the blanks)	5	5	1	5
Part A-III Q. No(11-15)	One from each unit (True Or False)	5	5	1	5
Part A-IV Q. No(16-20)	One from each unit (Match Type)	5	5	1	5
Part B Q. No(21-27)	Open Choice- Each unit should contain minimum one question	7	5	7	35
Part C Q. No(28-32)	Open Choice - One from each unit	5	3	15	45

CERTIFICATE COURSE IN HANDLING CHEM-SOFTWARE

Semester: Even Semester **Credits: 2**

Code : CCCHHC01 **Hours: 3**

COURSE OUTCOMES:

- Equip the skills to apply origin software
- Develop the skills to handle smiles
- Apply the skills to draw chemical structures
- Apply the knowledge of chem software in project
- Represent the spectral data graphically

UNIT I

CHEMDRAW I:

Introduction - definition - modes - main tools - analysis window - chemical properties window - panels in drawing - chemical structures - drawing tools and objects - templates - conversion of name to structure and vice versa (**9 Hours)**

UNIT II

CHEM DRAW II:

Significance of chem draw - role of chem draw in chemistry - chem sketch practices: benzene, DDT, BHC, glucose, sucrose, enantiomers, 18- annulene - writing equations - chem sketch - 3D - drawing chemical structure - pasting them in text - saving files as images (**9 Hours)**

UNIT III

SMILES:

Introduction - definition - usage of the Smiles in chemistry: atoms, bonds, branches and rings - geometrical isomers (**9 Hours)**

UNIT IV

ORIGIN:

Introduction - file : new - open - save project - edit : copy - paste -import : single ASCII - graphical plot : line, symbol, line+symbol - column bars - multicurve - export graph - windows : work book (**9 Hours)**

UNIT V

DATA ANALYSIS USING ORIGIN:

Format menu - analysis - linear and non linear graphs - UV - Visible spectral data - FT-IR spectral data- fitting linear graph for first order rate constant: ester hydrolysis - fitting non-linear graph for conductometric titrations (**9 Hours)**

CERTIFICATE COURSE IN "HANDLING CHEM-SOFTWARE"

TESTING AND EVALUATION OF CERTIFICATE COURSE

DISTRIBUTION OF MARKS

Internal: 40 marks

The component for internal exam is at the discretion of the department.

Test I : 20 marks

Test II : 20 marks

Average of Two Tests : 20 marks

Practical : 20 marks

Internal : 40 marks

External : 60 marks

QUESTION PATTERN (Blue Print of External Question Paper)

(External at the end of the semester and credits will be awarded)

Time: 3 hours **Max.Marks: 60**

Section	Types of Question	Number of Qns	Number of Qns to be answered	Marks for each Qn	Total
A Q.No(1-10)	Fill ups -5 qns (one from each unit) Multiple choice qns - 5 qns (one from each unit)	10	10	1	10
B Q.No(11-15)	Should contain qns from all five units	5	4	5	20
C Q.No(16-20)	Should contain qns from all five units (not exceeding 2 qns from the same unit)	5	3	10	30

PART I - HINDI - COURSE PATTERN (2017- 2020)

Part	Sem.	Code	Title of the Paper	Hours	Credits
I	I	17GH1GS01	Paper - I - Prose, Short Story and Grammar- I	5	3
	II	17GH2GS02	Paper - II - Novel, One act Play, and Grammar - II	5	3
	III	17GH3GS03	Paper - III Poetry and History of Hindi Literature, Alankar	5	3
	IV	17GH4GS04	Paper IV - General Essay, Technical Hindi, Translation, and Letter Writing	5	3
		Total		**20**	**12**

TESTING AND EVALUATION

Course	Continuous Internal Assessment	Semester Examination
Hindi	40%	60%

Continuous Internal Assessment

Continuous Assessment will be carried out by the Course Teachers. The components of CIA are as follows:

Components	Marks
Test -I	30
Test -II	30
Seminar/Quiz	10
Assignment	05
Attendance	05
Total	***80**

* The total internal marks obtained for 80 will be converted into marks obtained for 40.

HINDI - EXTERNAL QUESTION PATTERN

Time: 3 Hours **Marls: 60**

Section A: (One Word / Sentence) 10 x 1 = 10 Marks

Section B: (Paragraph / Annotation) 4 x 5 = 20 Marks

Section C: (Essay) 3x 10 = 30 Marks

PAPER I - PROSE, SHORT STORY AND GRAMMAR - I

Semester: I **Hours: 5**

Code : 17GH1GS01 **Credits: 3**

COURSE OUTCOMES:

- ❖ Develop the reading and writing skill in Hindi.
- ❖ Learn the concept of "Bhakthi" through Hindi Poems.
- ❖ Inculcate the Value and Morals through short stories in Hindi
- ❖ Improve the grammatical knowledge and enable the students to communicate effectively.
- ❖ Appreciate the literary contribution of various writers through short stories and poems.

1. Prose : Naveen Hindi Patamala Part-3
Published by Dakshina Bharathi Hindi Prachar Sabha,
Thyagaraya Nagar, Chennai - 600 017.
The following Lessons have been prescribed

a) Shiraj Ki Gurubhakthi
b) Shri Krishn
c) Gupth Rupya
d) Karmaveer Kamaraj

2. Short Story : Kahani Manjari
Edited by : Dakshin Bharath Hindi Prachar Sabha,
Thyagaraya Nagar, Chennai - 600 017.
The following short stories have been priscribed

a) Badegar kee beti	-	Premchand
b) Thayee	-	Vishwamranava Shrama Kaushik
c) Paanch minute	-	Mohanlalji Mahato yogi
d) Usne Kaha tha	-	Chandra dharshama Guleri

3. Grammar 1 : Vyakaran Pradeep Published by Ramdev, Hindi Bhaan,
63, Tagore Nagarm Allahabad -2
The following topics have been prescribed

a) Noun b) Gender and Number
c) Pronoun d) Adjectives

PAPER II - NOVEL, ONE ACT PLAY AND GRAMMAR - II

Semester: II **Hours: 5**

Code : 17GH2GS02 **Credits: 3**

COURSE OUTCOMES:

- Analyse the impact of social references among women through the novel of 'Nirmala'.
- Demonstrate the creative skill through one Act play.
- Inculcate the values of patriotism among students through the one Act play of Doorshra Din.
- Formulate the approach of Hindi linguistic and grammar
- Analyse on literary critism in Hindi literature.

1. **Novel** : Nirmala (Abridged version)
   by Premchand, Hamsa Prakashan Allahabad
2. **One Act Play** : Aadarsh Ekanki
   Published by Dakshina Bharath Hindi Prachar Sabha,
   Thyagaraya Nagar, Chennai - 600 017.
   The following Ekankies have been prescribed
   a) Doosra din - Kanchanlatha sabbarval
   b) Rajpoothri Ka badla - Divjendralal Rai
3. **Grammar** : Ramdev, Published by Hindi Bhavan,
   63 Tagore Nagar, Allahabad - 2
   The following topics have been prescribed
   a) Verb
   b) Tense and Voice
   c) Adverb
   d) Prepositions
   e) Conjunctions
   f) Interjunctions

PAPER III - POETRY AND HISTORY OF HINDI LITERATURE, ALANKAR

Semester: III **Hours: 5**

Code : 17GH3GS03 **Credits: 3**

COURSE OUTCOMES:

- Understand the spiritual and social values through Dona of Kabir, Tulasi, Rahim and Bihari.
- Analyse the literary approach of various Hindi Poems.
- Analyse the history of Hindi Literature.
- Develop the knowledge regarding Alankkar in Hindi Literature.
- Apply Alankkar to enhance the beauty of literature.

1. POETRY:

Kavya Saurab Published by Dakshina Bharatha Hindi Prachar Sabha, T. Nagar, Chennai - 600 017.

The following poems have been prescribed

1. Sachche Devtha - Ayodhya Singh Upadhyay Harioudh
2. Murjhaphool
3. Vivshtha
4. Badal - Sumitranandan Panth
5. Vasanth Aayaa
6. Deep Koi jal raha hai
7. Kabir Ke Dohe - 5 numbers
8. Tulasi Ke Dohe - 5 numbers
9. Raheem Ke Dohe - 5 numbers
10. Bihari Ke Dohe - 5 numbers

2. HISTORY OF HINDI LITERATURE:

Hindi Sahitya Ka Ithas by Rajanath Sharma Vinod Pushhak Mandir, Agra - 2

The following topics have been prescribed Salient features of Aadikl Bakthikal (Gyan marg, Premmag, Rambakthi, Krishnabakthi and Reethika.

Short Notes from Adunikkal**:** Chayavad, Pragathivad, Mythili Sharan, Gupta, Dinkar Premchand Pant Prasad, Ramachandra Shukla

3. ALANKAR:

Ras chand Alankar Chandrika Karnataka Mahila Hindi Seva Samithi, Chamarajpet, Bangalore - 560 008. The following Alankars have been prescribed Anupras, Yamak, Vakrokthi, Upama, Virodabhas.

PAPER - IV - GENERAL ESSAY, TECHNICAL HINDI, TRANSLATION AND LETTER WRITING

Semester: IV **Hours: 5**

Code : 17GH4GS04 **Credits: 3**

COURSE OUTCOMES:

- ❖ Write argumentative essay using appropriate style, structure and voice.
- ❖ Harness the critical thinking abilities by reading essay.
- ❖ Improve the proficiency in Hindi and English translation.
- ❖ Imbibe the knowledge of technical terms in Hindi and its application in daily life.
- ❖ Learn the forms and convention of different types of letter.

1. General Essay:

Nibandh Praveshika, Dakshin Bharath Hindi Prachar Sabha T.Nagar, Chennai - 600 017

The following Sahityotar (General) essay have been prescribed

a. Anushashan
b. Parishram Ka Mahatva
c. Paropkar
d. Bharat Ki Kalatmak Ekta
e. Nari Ka Karthavye Aur Adhikaar

2. Translation: Anuvad Abyas - III (1-5 Lessons) English to Hindi, Hindi to English Published by Dakshina Bharath Hindi Prachar Sabha T.Nagar, Chennai - 600 017.

3. Technical Hindi: Karyalaya Sahayika, Kendriya Sachivalaya Hindi Parishad NewDelhi, Hindi Vathayan Dr. K. Chandra Mohan, Viswa Vidyalaya Prakashan Varanashi

Banking Terms	:	50 only
Nemikaryalaya Tippani	:	50 only
Name of the Ministries	:	33 only

4. Letter Writing: Pramanik Alekan Aur Tippan Prof Viraj M.A. Kashmirgate, Delhi - 110 006

PaariVarik Patra, Avedan Patra, Sampathak ke naam Patra, Padhadhikariyon ke naam Patra.

NATIONAL CADET CORPS

NON MAJOR ELECTIVE

Sem.	Part	Code	Title of Paper	Hours	Credits
V	IV	17NC5NE01	Organization and health programme in NCC	2	2
VI	IV	17NC6NE02	National integration and personality development	2	2

INTERNAL COMPONENTS

Internal - I	:	30 marks
Internal - II	:	30 marks
Component - I	:	10 marks
Component - II	:	10 marks
Component - III	:	10 marks
Component - IV	:	10 marks
Total	**:**	**100 marks**

ORGANIZATION AND HEALTH PROGRAMME IN NCC

Semester: V **Hours: 2**

Code : 17NC5NE01 **Credits: 2**

UNIT I: INDIAN MILITARY AND NCC ORGANIZATION

History of Indian Military - Paramilitary forces - BSF- CRPF and CISF - NCC Organization and History - Aims and Objectives of NCC - Motto of NCC - DG's Four Cardinal Principles of NCC - NCC Song- Ranks in Army, Air force and Navy - Certificate Examination in NCC- Honours and Awards. **(6 Hours)**

UNIT II: MAP READING

Map and its features - kinds of north - Service protractor and Compass-bearing - Conversion of bearings - Conventional signs - Setting of map - Finding own position - Map to ground - Ground to map - Night March chart. **(6 Hours)**

UNIT III: HYGIENE AND SANITATION

Personal Hygiene - Sanitation - Methods of purification of drinking water -Latrine types - Urinal Types. **(6 Hours)**

UNIT IV: TYPES OF DISEASE AND POLLUTION

Define Health - Types of Health - Communicable and Non communicable Disease - Pollution and its type. **(6 Hours)**

UNIT V: FIRST AID

Aims of First Aid - Principle of First Aid - Motto of First Aid - List of items in First aid Box - Types of Bandages - Types of Fracture - Dislocation - Types of Wounds - Burns and Scalds - Sprain - Strain - Asphyxia - Drowning - Poison - Shock - Snake bite - Sun and Heat Stroke - Insect bite - Dog bite - Hanging - Artificial Respiration - Haemorrhage. **(6 Hours)**

BOOK FOR REFERENCE:

Mishra R.C., **A Handbook of NCC,** Kanti Prakashan, Etawah, 2000.

NATIONAL INTEGRATION AND PERSONALITY DEVELOPMENT

Semester: VI **Hours: 2**

Code : 17NC6NE02 **Credits: 2**

UNIT I: NATIONAL INTEGRATION

Motto of National Integration - Importance of National Integration Culture and heritage of Tamil Nadu. **(6 Hours)**

UNIT II: CIVIL AFFAIRS

Aim of aid to civil authority - Role of NCC Cadets during natural calamities - Types of disaster - Essential services during natural calamities **(6 Hours)**

UNIT III: CIVIL DEFENCE AND SELF DEFENCE

Civil Defence - Organization - Aims and services - Aid to Civil authorities in emergency - Self Defence -Aims of Self Defence - Women and Self Defence **(6 Hours)**

UNI IV: LEADERSHIP AND PERSONALITY DEVELOPMENT

Leadership - Types and traits - Man Management in NCC - Duties of a Good Citizen - Role of Youth in Nation Building - Morale - Factors which affect morale - Factors which develop high morale Personality Development - Factor influencing Personality-Time Management . **(6 Hours)**

UNIT V: SOFT SKILLS

Soft skills - interview skill - influencing skill - social skill - communication skill - self motivation - self esteem - body language. **(6 Hours)**

BOOK FOR REFERENCE:

Mishra R.C., **A Handbook of NCC,** Kanti Prakashan, Etawah, 2000.

INTERNAL QUESTION PATTERN

Time: 2 hours **Marks: 30**

PART - A

Answer Any 4 out of five 4 x 2 = 8

PART- B

Two either or questions (one from each) 2 x 4 = 8

PART - C

Two either or questions (one from each 2 x 7 = 14

PHYSICAL EDUCATION

COURSE PATTERN (2017 - 2020)

(PART V)

Sem.	Code	Title of the Paper	Hours	Credits
I & II	17NP4GS01	Yoga and Rhythmic Activities	120	-
III & IV		Fundamentals of Physical Education	120	1
		Total	**240**	**1**

YOGA AND RHYTHMIC ACTIVITIES

Semester: I & II **Hours: 120**

Code : 17NP4GS01

COURSE OUTCOMES:

- Recall the principle of Asnas
- Classify Pranayama for different needs
- Appraise the application and effects of Suryanamaskar for human wellness
- Execute the techniques in Free Hand Exercise
- Construct Pyramids based on the underlying principles

UNIT I: ASNAS

Sitting Postures - Standing Posture - Prone Posture - Supine Postures.

(24 hours)

UNIT II: PRANAYAMA

Pranayama - Suga Pranayama - Chandra bethana - Nadi Sudhi - Ujjayee - Seethali -Seethakari - Brahmari. **(24 hours)**

UNIT III: SURYANAMASKAR

Suryanamaskar: 12 Postures - 12 Postures & Breathe consioius - 12 Postures With manthra - Relaxation Techiniques. **(24 hours)**

UNIT IV: CALLISTHENICS (FREE HAND EXERCISE)

Standing series - Bending series - Sitting series - Twisting series - Dumb - bells - Indian Clubs - Lezium - Hoops. **(24 hours)**

UNIT V: AEROBICS & PYRAMIDS

Aerobics: Aerobic Basics - Aerobic Movements - Aerobic With Rhythm - Aerobic Programme

Pyramids: Basics of Pyramids - Types of Pyramids. **(24 hours)**

BOOKS FOR REFERENCE:

1. Wuest Jeborah, A and Charles A. Bucher (1987), 'Foundation of Physical Education, B.I Publication Pvt. Ltd., New Delhi.
2. Elangovan. R, (2002), 'Utarkalvi Oru Arimugam', Ashwin Publication, Triunelveli.
3. Chandrasekaran. K, (1999), 'Sound Health through Yoga, Prem Kalyan Publication, Sedapatti.
4. Iyengar, B.K.S, 'Lights on Yoga', Unwin Hyman Company, London

FUNDAMENTALS OF PHYSICAL EDUCATION

Semester: III & IV **Hours: 120**

Code : 17NP4GS01 **Credits: 1**

COURSE OUTCOMES:

- Familiarize the fundamentals of Physical Education
- Illustrate different rules for different games and athletic events
- Examines the need for good nutrition
- Synthesis the relation between hygiene and health
- Apply the first aid techniques

UNIT I: PHYSICAL EDUCATION

Definition, need, scope, aims and objectives of physical education. **(24 hours)**

UNIT II: GAMES AND ATHLETEIC EVENTS

History of Games: Basketball, Volley Ball, Kho-Kho, Kabaddi, Badminton and Ball Badminton - Rules and regulation of the Games and Athletic Events. **(24 hours)**

UNIT III: NUTRITION

Balanced Diet, Daily Energy Requirement, Nutrient Balance, Nutrition Intake, Diet and Competition, Nutritional Tips, Your Ideal Weight. **(24 hours)**

UNIT IV: HEALTH EDUCATION

Meaning of health education, Definition of health education, Personal Hygiene, Communicable Diseases **(24 hours)**

UNIT V: FIRST AID

First Aid: Injuries to bones and Muscles, Sprain, Strain, Muscle Cramp and joints Dislocation and Fractures Snake-bite, Dog bite Poisoning, Artificial Respiration, (Drowning) **(24 hours)**

BOOKS FOR REFERENCE:

1. Sathyanesan, R.C., 'Hand Broken Physical Education, 'Gheena Publishers, Madurai.
2. Thirunarayanan, C and Hariharan, S, 'Analytical History of physical Education 'South India Press, Karaikudi.
3. St. John Ambulance Association, 'First Aid to the Injured' New Delhi.
4. Prabhakar Eric, (1995), 'The way to Atheletic Gold', Affliated East West Pvt. Ltd., New Delhi.

SCHEME OF EVALUATION

1.	Summative Examination (2 hours)	:	40 marks
2.	Continuous Internal Assessment	:	60 marks
	Total	**:**	**100 marks**

SCHEME OF EVALUATION FOR CONTINUOUS INTERNAL ASSESSMENT

1.	Attendance (240 hrs)			:	20 marks
	❖ Theory Class	:	120 hrs		
	❖ Games	:	60 hrs		
	❖ Field Work	:	60 hrs		
2.	Performance in any one Game			:	10 marks
3.	Performance in any one of Athletic event			:	10 marks
4.	Performance in Yoga / Rhythmic activities			:	10 marks
5.	Assignment			:	10 marks
	Total			**:**	**60 marks**

QUESTION PATTERN FOR SUMMATIVE EXAMINATION

Total marks: 40 **Time: 2 hours**

SECTION - A

Answer All Questions (5x1=5)

(Choose the best Answer)

SECTION - B

Answer any four questions (4x2=8)

(Four question out of six)

SECTION - C

Answer any Four out of Six questions (4x5=20)

(Four question out of six)

SECTION - D

Answer any one question (1x7=7)

(One question out of two)