

GOVERNMENT ARTS COLLEGE (AUTONOMOUS): KARUR – 639 005

B.Sc., CHEMISTRY COURSE STRUCTURE UNDER CBCS SYSTEM

(For the candidates admitted from the year 2015-16 onwards)

SEMESTER	COURSE	SUBJECT TITLE	SUBJECT CODE	INSTR. HOURS WEEK	CREDIT	EXAM HOURS	MARKS		TOTAL
							INT	ESE	
I	Tamil - I	Tamil – I	U15L1T1	6	3	3	25	75	100
	English - I	English – I	U15L1E1	6	3	3	25	75	100
	Core Course – I	General Chemistry – I	U15CH1C1	6	5	3	25	75	100
	Core Course – II	Volumetric Analysis (Practical)		3	-	-	-	-	-
	First Allied Course-I	Allied Physics – I	U15PH1A1	5	3	3	25	75	100
	First Allied Course – II	Allied Physics – II (Practical)		2	-	-	-	-	-
	Value Education	Value Education	U15VE1	2	2	3	25	75	100
				30	16				500
II	Tamil – II	Tamil – II	U15L2T2	6	3	3	25	75	100
	English – II	English – II	U15L2E2	6	3	3	25	75	100
	Core Course – II	Core Course Practical - I	U15CH2C2P	3	4	3	25	75	100
	Core Course – III	General Chemistry - II	U15CH2C3	6	5	3	25	75	100
	First Allied Course - II	Allied Physics – II (Practical)	U15PH2A2P	2	4	3	25	75	100
	First Allied Course – III	Allied Physics - III	U15PH2A3	5	3	3	25	75	100
	Environmental Studies	Environmental Studies	U15ES2	2	2	3	25	75	100
				30	24				700
III	Tamil - III	Tamil- III	U15L3T3	6	3	3	25	75	100
	English – III	English -III	U15L3E3	6	3	3	25	75	100
	Core Course – IV	General Chemistry - III	U15CH3C4	6	5	3	25	75	100
	Core Course V	Semi Micro Qualitative Analysis – (Practical II)		3	-	-	-	-	-
	Second Allied Course-I	Allied Mathematics – I / Allied Zoology	U15MM3A1/ U15ZO3A1	5	3	3	25	75	100
	Second Allied Course-II	Allied Zoology Practical/Allied Maths II		2	-	-	-	-	-
	Non Core Elective I	Energy Physics-I	U15PH3N1	2	2	3	25	75	100
				30	16				500
IV	Tamil – IV	Tamil- IV	U15L4T4	6	3	3	25	75	100
	English – IV	English -IV	U15L4E4	6	3	3	25	75	100
	Core Course – V	Core Course Practical - II	U15CH4C5P	2	4	3	25	75	100
	Core Course VI	General Chemistry - IV	U15CH4C6	5	5	3	25	75	100
	Second Allied Course II	Allied Mathematics II / Allied Zoology –II Practical	U15MM4A2/ U15ZO4A2P	2	4	3	25	75	100
	Second Allied Course III	Allied Mathematics – III / Allied Zoology – III	U15MM4A3/ U15ZO4A3	5	3	3	25	75	100
	Skill Based Elective I	Laboratory Hygiene and Safety	U15CH4S1	2	4	3	25	75	100
Non Core Elective II	Energy Physics II	U15PH4N2	2	2	3	25	75	100	
				30	28				800
V	Core Course – VII	Inorganic Chemistry – I	U15CH5C7	5	5	3	25	75	100
	Core Course – VIII	Organic Chemistry – I	U15CH5C8	5	4	3	25	75	100
	Core Course – IX	Physical Chemistry - I	U15CH5C9	4	3	3	25	75	100
	Core Course - X	Physical Chemistry – (Practical)		3	-	-	-	-	-
	Core Course - XI	Gravimetric and Organic Compound Analysis (Practical)		3	-	-	-	-	-
	Elective Course - I	Industrial Chemistry	U15CH5E1	4	4	3	25	75	100
	Skill Based Elective II	Spectroscopy - I	U15CH5S2	2	4	3	25	75	100
	Skill Based Elective III	Spectroscopy - II	U15CH5S3	2	4	3	25	75	100
	Soft Skill Development	Soft Skill Development	U15SSD3	2	2	3	25	75	100
				30	26				700
VI	Core Course – X	Core Course Practical - III	U15CH6C10P	3	4	3	25	75	100
	Core Course – XI	Core Course Practical - IV	U15CH6C11P	3	5	6	25	75	100
	Core Course – XII	Inorganic Chemistry - II	U15CH6C12	6	5	3	25	75	100
	Core Course - XIII	Organic Chemistry - II	U15CH6C13	6	5	3	25	75	100
	Elective Course - II	Analytical Chemistry	U15CH6E2	5	5	3	25	75	100
	Elective Course - III	Physical Chemistry - II	U15CH6E3	6	4	3	25	75	100
	Extension Activities	Extension Activities		-	1	-	-	-	-
	Gender Education	U15EA4	1	1	3	25	75	100	
				30	30				700
TOTAL				180	140				3900

Sl. No.:

Subject Code:

U15L1T1

அரசு கலைக் கல்லூரி (தன்னாட்சி) - ஈநர் - 5
கலையியல் / அறிவியல் / வணிகவியல் / பட்ட வகுப்பு
(2015 - 2016 ஆம் கல்வியாண்டு முதல் பயிலும் மாணவர்களுக்குரியது)
பகுதி - 1 பொதுத்தமிழ் -1 - முதல் பருவம்
மரபுக்கவிதை, புதுக்கவிதை, சிறுகதை, இலக்கணம், இலக்கிய வரலாறு

பொதுத்தமிழ் -1 முதல் பருவம்

(மரபுக்கவிதை, புதுக்கவிதை, சிறுகதை, இலக்கணம், இலக்கிய வரலாறு)

அலகு 1 மரபுக்கவிதைகள்

- அ) தமிழ்த்தாய் - பாரதியார்
ஆ) புத்தகச்சாலை - பாரதிதாசன்
இ) புத்தரும் ஏழைச்சிறுவனும்
(ஆசியஜோதி) - கவிமணி
ஈ) நோயற்ற வாழ்வு - நாமக்கல் கவிஞர்
உ) இரசம் தீர்ந்து விட்டது
(இயேசு காவியம்) - கண்ணதாசன்
ஊ) அதிவீரராம பாண்டியன் - சுரதா

அலகு 2 புதுக்கவிதைகள்

- அ) மீரா கவிதைகள் (நான் மனிதன்) - மீரா
ஆ) தேசப்பிதாவுக்கு ஒரு தெருப்பாடகனின் அஞ்சலி (கண்ணீர்ப்பூக்கள்)
- மு.மேத்தா
இ) வடலூரும் வார்தாவும்(நேயர் விருப்பம்)- அப்துல் ரகுமான்
ஈ) சர்ப்ப யாகம் - சிற்பி
உ) விசுவாமித்திரர் (அவதார புருஷன்) - வாலி
ஊ) நிலத்தை ஜெயித்த விதை
(இன்னொரு தேசிய கீதம்) - வைரமுத்து
எ) ஒரு வண்டி சென்றியூ(10 கவிதைகள்)- ஈரோடு தமிழன்பன்

அலகு 3 சிறுகதை

- சிறுகதைத் தொகுப்பு - நியூ செஞ்சுரி புக் ஹவுஸ்

அலகு 4 இலக்கணம்

- வல்லினம் மிகும் இடங்கள் - நல்ல தமிழ் எழுத வேண்டுமா?
வல்லினம் மிகா இடங்கள் - அ.கி.பரந்தாமனார்

அலகு 5 இலக்கிய வரலாறு

மரபுக்கவிதை, புதுக்கவிதை, சிறுகதை

பரிந்துரை நூல்

- முனைவர் கா.வாசுதேவன் -பன்முக நோக்கில் தமிழ் இலக்கிய வரலாறு
தேவன் பதிப்பகம்,16/43, திருநகர்,
திருவானைக்கோவில்,திருச்சி

ஐந்து அலகுகளிலும் சம அளவில் வினாக்கள் அமைதல் வேண்டும்.

வினாத்தாள் அமைப்பு முறை

பகுதி அ (ஒரு மதிப்பெண் வினா - 20)

- அ) பொருத்தமான விடையைத் தேர்ந்தெடுத்தல் 5*1=5
ஆ) கோடிட்ட இடங்களை நிரப்புதல் 5*1=5
இ) பொருத்துதல் 5*1=5
ஈ) ஒரே சொற்களில் விடையளித்தல் 5*1=5

பகுதி ஆ (ஐந்து மதிப்பெண் வினா)

இது அல்லது அது என்ற வகையில் அமைதல் வேண்டும் 5*5=25

பகுதி இ (பத்து மதிப்பெண் வினா)

ஐந்தில் எவையேனும் மூன்றனுக்கு மட்டும் கட்டுரை வடிவில் விடை எழுத வேண்டும்.

3*10=30

மொத்த மதிப்பெண் -75

Sl. No.:

Subject Code:

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR- 05
ALL UG COURSES - I SEMESTER - PART – II - ENGLISH
(For the candidates admitted from the year 2015-16 onwards)

ENGLISH – I

Unit I

- Monday Morning - Mark Twain
My Financial Career - Stephen Leacock

Unit II

- Indian Women - S. Radhakrishnan
Head Ache - R. K. Narayan

Unit III

- Thomas Alva Edison - Egon Larson
Helen Keller - Patrick Pringle

Unit IV

Word Classes

I. Open Classes

1. Nouns
2. Adjectives
3. Verbs
4. Adverbs

II. Closed Classes

1. Pronouns
2. Determiners
3. Prepositions
4. Conjunctions
5. Exclamations / Interjections

Unit V

1. Spelling Rules
2. Words Often Confused or Misused
3. Homophones

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COE

Sl. No.:

Subject Code:

U15CH1C1

GOVERNMENT ARTS COLLEGE (AUTONOMOUS):: KARUR-05**B.Sc., CHEMISTRY - I SEMESTER – CORE COURSE - I**

(For the candidates admitted from the year 2015-16 onwards)

GENERAL CHEMISTRY - I

- UNIT - I Inorganic Chemistry 15 hours**
- 1.1 Volumetric Analysis**
Standard Solutions – Primary and Secondary Standards – Types of Titrimetric reactions – Redox – Precipitation – EDTA – Titrations. Indicators – Effect of change in pH.
- 1.2 Boron Family**
Comparative study of Boron Family Elements and their Compounds (Hydrides, Oxides and Halides) – Chemistry of Diaborane, Borax and Borazole.
- 1.3 Carbon Family**
Comparative study of Carbon Family Elements and their Compounds (Hydrides, Oxides and Halides) – Chemistry of Cyanogen, Hydrocyanic Acid, Cyanic Acid, Thiocyanic Acid, Ammonium Thiocyanate and Carbon Disulphide. Structure of Graphite, Diamond and Fullerene.
- UNIT-II Inorganic Chemistry 15 hours**
- 2.1 Chemical Bonding Lattice Energy and Born-Haber Cycle**
- 2.2 Polarising power and Polarisability – Partial ionic character from electronegativity – Transition from ionic to covalent character and vice – versa – Fajan’s rule – Concept of hard and soft acids and bases.**
- 2.3 VSEPR Theory shapes of simple inorganic molecules (BeCl₂, SiCl₄, PCl₅, SF₆, IF₇, H₂O, NH₃, and XeF₆ containing lone pair and bond pairs of electrons – Lewis structures. Hydrogen bonding – Its nature, types, effect on Properties.**
- UNIT - III Organic Chemistry 15 hours**
- 3.1 Petroleum** Thermal and Catalytic Process of Cracking
Synthetic Petrol – Fischer Tropsch’s process and Bergius Process, Flash Point, Fire Point, Smoke Point, Knocking, Octane number and Cetane number, Antiknocking Agents, Power Alcohol, Biodiesel.
- 3.2 Alkenes**
Preparation by Dehydration, dehydrohalogenation methods – Reduction of alkynes, Witting reaction Kolbe’s electrolysis – Properties of Alkenes – Electrophilic and free radical addition, addition reactions with hydrogen bromide (peroxide effect) sulphuric acid, water, hydroboration, ozonolysis, hydroxylation with KMnO₄
- UNIT - IV Organic Chemistry 15 hours**
- 4.1 Electron displacement effects – Inductive, Inductometric, Electrometric, Mesomeric, resonance, hyperconjugation and steric effects.**
Cleavage of Bonds – Homolytic and Heterolytic fission of carbon – Carbon bonds, Reaction intermediates – Free Radicals, Carboctions and Carbanions, Carbenes their stability.
- 4.2 Alkynes**
Preparation of alkynes – Dehydrohalogenations, dehalogenation, hydration of calcium carbide – Kolbe’s electrolysis.
Acidity of alkynes – formation of acetylides – addition of water with HgSO₄ catalyst, addition of hydrogen halides and halogens, oxidation, ozonolysis and hydroboration. (An elementary idea).
- UNIT - V Physical Chemistry 15 hours**
- Gaseous State** Critical Phenomena – PV isotherms of real gases, critical temperature, continuity of state – relation between critical constants and van der Waals constants – Determination of critical volume - the law of corresponding states – reduced equation of state.
Molecular velocities – Root mean square, average and most probable velocities – Maxwell Boltzmann distribution of molecular velocities (no derivations) – Collision number and mean free path – Collision diameter.

Books Recommended:

1. J.D.Lee, Concise Inorganic Chemistry, 5th Edition, Blackwell science.
2. B.R. Puri, L.R. Sharma and K.C. Kalia, Principles of Inorganic Chemistry, S.L.N. Chand & Co.
3. B.S. Bahl and Arun Bahl, Advanced Organic Chemistry, S.Chand & Co.
4. I.L. Finar, Organic Chemistry, Vol.I Pearson Education, 6th Edition.
5. B.R. Puri, L.R. Sharma and N.S. Pathania, Principles of Physical Chemistry Vishal Publishing Co. 41st Edition.
6. P.L. Soni & O.P. Dharmarha, Text Book of Physical Chemistry, Sultan Chand & Sons.

Sl. No:

Subject Code:

U15PH1A1

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

B.SC.,-I SEMESTER – ALLIED COURSE-I

(FOR CHEMISTRY & MATHEMATICS MAJOR)

(For the candidates admitted from the year 2015-16 onwards)

ALLIED PHYSICS – I

UNIT- I: PROPERTIES OF MATTER

Stress – strain - Hooks law - Elastic constants - Young's modulus by non-uniform bending - Static torsion - Rigidity modulus by torsion pendulum - I form of girder - Surface Tension: Surface tension of the liquid by drop weight method - Explanation of molecular theory - Viscosity: Newton's formula - Poiseuille's formula - stream line motion - Turbulent motion - Critical velocity - Co-efficient of viscosity - Co-efficient of viscosity by Poiseuille's method - Ostwald's viscometer.

UNIT-II: MECHANICS

Force - centripetal and centrifugal forces - Laws of friction - co-efficient of friction - Banking of curved tracks - Newton's law of gravitation – Kepler's laws of Planetary motion - Deduction of Newton's law of gravitation from Keplers law - Centre of gravity - Centre of gravity of solid cone - Flootation laws - Stability of floating bodies.

UNIT-III: HEAT AND THERMODYNAMICS

Celcius – Rankine-Fahrenheit Scale - Entropy and Enthalpy definition - Thermal conductivity of a bad conductor by Lees Disc method - Newton's law of cooling - Specific heat capacity of liquids - Liquification of gases – Linde's process - Isothermal and adiabatic process - zeroth, first, second laws of thermodynamics - solar constant - Angstrom pyroheliometer

UNIT-IV: MAGNETISM AND ELECTROMAGNETISM

Magnetic materials - Properties of dia, para, ferro and anti ferro magnetic materials - Permeability and susceptibility - Laws of electromagnetic Induction - Biot and Savarts law - Force acting on a conductor carrying current in magnetic field – Moving coil galvanometer - Eddy currents – applications.

UNIT-V: SOUND

Laws of stretched strings - determination of frequency of alternating current by Sonometer - characteristics of musical sound - Acoustics of buildings – Decibel - Reverberation time - Sabine's formula for reverberation time - Condition for good acoustics - Ultrasonics: Piezo-electric effect - piezo-electric oscillator - Properties of ultrasonic waves and its applications.

BOOKS FOR STUDY:

Unit-I

1. Brijlal subramaniam, *Properties of matter and sound.*
2. R. Murugesan *Properties of matter and sound.*

Unit-II

1. R. Murugesan *Allied Physics I & II.*
2. A. Sundaravelusamy *Allied Physics.*

Unit-III

1. Heat and Thermodynamics - Brijlal subramaniam
2. Heat and Thermodynamics - Narayanamurthi and Nagarathinam

Unit-IV

1. Electricity and magnetism — R. Murugesan
2. Electricity and magnetism — Narayanamurthi and Nagarathinam
3. Electricity and magnetism - Brijlal subramaniam

Unit-V

1. Sound -- Brijlal subramaniam
2. Sound – R.L. Seihgal

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COE

Sl. No.:

Subject Code:

U15VE1

அரசு கலைக் கல்லூரி (தன்னாட்சி), ஈரூர் - 639005
அனைத்து இளநிலை - முதல் பருவம் - பகுதி - 4
(2015 - 2016 கல்வியாண்டு முதல் பயிலும் மாணவர்களுக்கு உரியது)

மதிப்புக்கல்வி

அலகு 1

வாழ்வியல் கல்வி ஓர் அறிமுகம் - தனிமனித நெறிமுறைகள் - சமுதாய நெறிமுறைகள் - ஆன்மீக நெறிமுறைகள் - வாழ்வியல் நெறிகளின் மூலங்கள் - வாழ்வியல் நெறிகளின் அவசியம் - நன்னடத்தையும் நற்செயல்களும் - நற்பண்புகள் உருவாக்கம்.

அலகு 2

சமூக நற்பணி - சமூக நலப்பணித்திட்டங்கள் - சமுதாயத் தீமைகள் குறித்த விழிப்புணர்வு - போதை மருந்துகளுக்கு அடிமையாதல் - மதுப்பழக்கம் - புகைப்பிடித்தல் - தற்கொலை.

அலகு 3

இந்து சமயத்தின் போதனைகள் - இஸ்லாம் போதிக்கும் நெறிகள் - கிறித்துவம் போதிக்கும் நெறிகள் - சமயச் சார்பின்மை - சமய நல்லிணக்கம்.

அலகு 4

காந்தியடிகளின் அகிம்சை கொள்கை - அன்னை தெரசாவின் தொண்டுகள் - தன்னலமின்மையின் வடிவம் பெருந்தலைவர் காமராசர்.

அலகு 5

சமூகநீதி - மனித உரிமைகளும் - அவற்றின் பாதுகாப்பும் - மகளிர்க்கு எதிரான வன்முறைகள் - நாட்டின் ஒருமைப்பாடு.

Text Book:

1. மதிப்புக் கல்வி - Y.K.55, கூட்டுறவு பண்டகசாலை, அரசு கலைக்கல்லூரி (தன்னாட்சி), ஈரூர் - 5.

CHAIRMAN – BOS

COE

Sl. No.:

Subject Code:

U15L2T2

அரசு கலைக் கல்லூரி (தன்னாட்சி) - கூநர் - 5
கலையியல் / அறிவியல் / வணிகவியல் / பட்ட வகுப்பு
 (2015 - 2016 ஆம் கல்வியாண்டு முதல் பயிலும் மாணவர்களுக்குரியது)
 பகுதி - 1 பொதுத்தமிழ் -2 - இரண்டாம் பருவம்
 (பக்தி இலக்கியங்கள், சிற்றிலக்கியங்கள், உரைநடை, இலக்கணம், இலக்கிய வரலாறு)

அலகு 1 பக்தி இலக்கியங்கள்

தேவாரம்

- திருநாவுக்கரசர்
(திருவையாறு- 4ஆம் திருமுறை)

நாலாயிர திவ்விய பிரபந்தம்

- மதுரகவி ஆழ்வார்(கண்ணி நுண் சிறுத்தாம்பு)

தெய்வமணிமாலை

- இராமலிங்க வள்ளலார்

பராபரக்கண்ணி

- குணங்குடி மஸ்தான் சாகிபு

யாக்கை நிலையாமை

- திருமந்திரம்

அலகு 2 சிற்றிலக்கியங்கள்

தமிழ்விடுதூது

- முதல் 16 கண்ணிகள்

திருக்குற்றாலக் குறவஞ்சி

- குறத்தி மலைவளம் கூறல்

நந்திக்கலம்பகம்

- பாடல் எண்கள்: 34,35,36,37,38,39,44,45,46,49

அபிராமி அந்தாதி

- 11-20 பாடல்கள்

கயிலாசநாதர் சதகம்

- அரிதெனல், இறந்தும் இருக்கின்றவர், இருந்தும் இறந்தவர், கோபக்கொடுமை, கல்விச் சிறப்பு

அலகு 3 உரைநடை

இனியவை நாற்பது

- முனைவர் இரா.மோகன்

அலகு 4 இலக்கணம்

வாக்கிய வகைகள்

- நல்ல தமிழ் எழுத வேண்டுமா?
அ.கி.பரந்தாமனார்

அலகு 5 இலக்கிய வரலாறு

பக்தி இலக்கியங்கள், சிற்றிலக்கியங்கள், உரைநடை

பரிந்துரை நூல்

முனைவர் கா.வாசுதேவன்

-பன்முக நோக்கில் தமிழ் இலக்கிய வரலாறு தேவன் பதிப்பகம்,16/43, திருநகர், திருவானைக்கோவில்,திருச்சி

ஐந்து அலகுகளிலும் சம அளவில் வினாக்கள் அமைதல் வேண்டும்.

வினாத்தாள் அமைப்பு முறை

பகுதி அ (ஒரு மதிப்பெண் வினா - 20)

அ) பொருத்தமான விடையைத் தேர்ந்தெடுத்தல் 5*1=5

ஆ) கோடிட்ட இடங்களை நிரப்புதல் 5*1=5

இ) பொருத்துதல் 5*1=5

ஈ) ஓரிரு சொற்களில் விடையளித்தல் 5*1=5

பகுதி ஆ (ஐந்து மதிப்பெண் வினா)

இது அல்லது அது என்ற வகையில் அமைதல் வேண்டும் 5*5=25

பகுதி இ (பத்து மதிப்பெண் வினா)

ஐந்தில் எவையேனும் மூன்றனுக்கு மட்டும் கட்டுரை வடிவில் விடை எழுத வேண்டும்.

3*10=30

மொத்த மதிப்பெண் -75

Sl. No.:

Subject Code:

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR- 05

ALL UG COURSES - II SEMESTER - PART – II - ENGLISH

(For the candidates admitted from the year 2015-16 onwards)

ENGLISH – II

Unit I

- The Luncheon - Somerset Maugham
A Cup of Tea - Katherine Mansfield

Unit II

- A Work of Art - Anton Checkov
The Necklace - Guy de Maupassant

Unit III

- My Lord the Baby - Rabindranath Tagore
An Astrologer's Day - R.K Narayan

Unit IV

The Sentence

1. Types of Sentences
2. Simple, Compound and Complex Sentences
3. Sentence Patterns

Unit V

Transformation of Sentences

1. Affirmative into Negative and vice versa
2. Interrogative into Assertive and vice versa
3. Exclamatory into assertive and vice versa
4. Simple, Compound and Complex sentences
5. Voice: Active and Passive
6. Degrees of Comparison

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Subject Code:

GOVERNMENT ARTS COLLEGE (AUTONOMOUS):: KARUR-05

B.Sc., CHEMISTRY - II SEMESTER – CORE COURSE - II

(For the candidates admitted from the year 2015-16 onwards)

CORE COURSE PRACTICAL – I (VOLUMETRIC ANALYSIS)

- UNIT-I** ACIDMETRY AND ALKALIMETRY
UNIT-II PERMANGANIMETRY
1. Estimation of Ferrous I (r) on in Mohr's salt
2. Estimation of Ferrous and Ferric I (r) ons in a misture
3. Estimation of Oxalic acid
4. Estimation of Calcium
UNIT - III DICHROMETRY
5. Estimation of Ferrous Iron
6. Estimation of Ferric Iron by using both internal and external indicators.
UNIT -IV IODO AND IODIMETRY
7. Estimation of Copper
8. Estimation of Potassium Dichromate.
9. Estimation of Arsenious Oxide.
UNIT – V ARGENTOMETRY
10. Estimation of Chloride (in neutral and acid media)
UNIT – VI COMPLEXOMETRIC TITRATIONS
11. Estimation of Zn, Mg and Ca ions using EDTA.
UNIT – VII Determination of melting and boiling points of simple organic compounds

Marks:

Int.Asst.	25
Practical	75

Total	100

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS): KARUR-05

B.Sc., CHEMISTRY - II SEMESTER – CORE COURSE - III

(For the candidates admitted from the year 2015-16 onwards)

GENERAL CHEMISTRY- II

UNIT- I Inorganic Chemistry (18 hours)

1.1 Nitrogen family

1.1.1 Chemistry of hydrazine, hydrazonic acid, hydroxyl amine and sodium bismuthate.

1.1.2 Non aqueous solvents – classification – liquid ammonia as solvent.

1.2 Ozone – Preparation, Properties, structural elucidation and uses. Green – house effect, ozone hole, causes and protection of ozone layer.

1.3 Hydrogen peroxide - Preparation, Properties, estimation, structure and uses.

1.4 Peroxides of sulphur – their preparation, properties, uses and structures.

UNIT-II Organic Chemistry (18 hours)

2.1 Dienes

Types of dienes – conjugated, isolated and cumulated

2.1.1 Stability and chemical reactivity – 1,2 and 1,4 additions, kinetic and thermodynamic controls of reaction. Diels – Alder reaction.

2.1.2 Synthesis of dienes – 1,3 – Butadiene, isoprene and chloroprene.

2.2 Cycloalkanes

2.2.1 Preparation using Wurtz's reaction, Dieckmann's ring closure and reductions of aromatic hydrocarbons.

2.2.2 Substitution and ring opening reactions.

2.2.3 Bayer's strain theory and theory of strainless rings.

UNIT - III Polymer Chemistry (18 hours)

3.1 Classification of polymers – natural, synthetic, semi synthetic, plastic, elastomers, addition, condensation polymers.

3.1.1 Mechanism of free radical, radical, anionic cationic – preparation of polyurethane.

Synthetic rubber – butyl. Buna –S, buna-N, neoprene, SBR, thiocol, silicone rubber, thermocole, nylons 6 and 6,6 and terylene.

UNIT – IV Physical Chemistry (18 hours)

4.1 Colloidal States: Stability of Colloids, Coagulation and protection, Reverse Osmosis, Desalination of sea water, Donnan membrane- Gels and emulsion.

4.2 Macro molecules : Number average and weight average molecular weight of macromolecules – determination of molecular weight by Osmometry (number average), ultra centrifuge(weight average), Viscometry and light scattering.

UNIT - V Physical Chemistry (18 hours)

5.1 Solid State

5.1.1 Isotropic and anisotropic solids.

5.1.2 Nature of the solid state – seven crystal systems – Bravais lattice, unit cell, law of rational indices (Weiss indices) Miller indices, symmetry elements in crystals (for cubic system only in detail)

5.1.3 X-ray diffraction by crystals – derivation of Bragg's – equation – Bragg method – powder method – crystal structure of NaCl, KCl, ZnS and CsCl – radius ratio and packing in Crystals-determination of Avogadro's number.

Books Recommended:

1. J.D.Lee, Concise Inorganic Chemistry, 5th Edition, Blackwell science.
2. B.R. Puri, L.R. Sharma and K.C. Kalia, Principles of Inorganic Chemistry, S.L.N. Chand & Co.
3. B.S. Bahl and Arun Bahl, Advanced Organic Chemistry, S.Chand & Co.
4. I.L. Finar, Organic Chemistry, Vol.I Pearson Education, 6th Edition.
5. B.R. Puri, L.R. Sharma and N.S. Pathania, Principles of Physical Chemistry Vishal Publishing Co. 41st Edition.
6. P.L. Soni & O.P. Dharmarha, Text Book of Physical Chemistry, Sultan Chand & Sons.

Sl. No:

Subject Code:

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

B.Sc., –II - SEMESTER – FIRST ALLIED COURSE – II

(FOR CHEMISTRY & MATHEMATICS MAJOR)

(For the candidates admitted from the year 2015-16 onwards)

ALLIED PHYSICS – II – LAB

(Any fifteen experiments)

1. Young's Modulus – Non Uniform Bending – Pin and Microscope.
2. Torsional Pendulum – Rigidity Modulus.
3. Surface tension and Interfacial Surface tension – Drop weight method.
4. Coefficient of Viscosity of liquid using graduated burette.
5. Specific heat capacity of liquid by cooling method.
6. Lee's Disc – Thermal Conductivity of a bad conductor.
7. Focal length of a concave lens.
8. Spectrometer – Grating – Normal incidence method.
9. Spectrometer – refractive index of solid prism (A, D and μ).
10. Newton's Rings – Radius of curvature of a convex lens.
11. Sonometer – Verification of transverse laws.
12. Carey Foster's bridge – specific resistance.
13. Meter bridge – Determination of specific resistance.
14. Potentiometer – Low range voltmeter calibration.
15. Potentiometer – Calibration of ammeter.
16. Table galvanometer – Figure of merit.
17. EMF of thermocouple – Direct deflection method.
18. Characteristics of a junction diode.
19. Construction of full wave rectifiers.
20. AND, OR and NOT Logic gates - Verification of truth table using discrete Components.

BOOKS FOR REFERENCE:

1. M.N. Srinivasan and others, *A Text book of Practical Physics* - Sultan Chand & Son, New Delhi.
2. A. Dhanalakshmi and K.R.Paramasivam, *Practical Physics* - Apsara publication, Trichy.

Sl. No:

Subject Code:

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05
B.SC.,-II- SEMESTER – FIRST ALLIED COURSE-III
(FOR CHEMISTRY & MATHEMATICS MAJOR)
(For the candidates admitted from the year 2015-16 onwards)

ALLIED PHYSICS – III

UNIT- I: OPTICS

Laws of Reflection and Refraction - Refractive index of prism using spectrometer - Interference - Newton's rings - Applications - Fresnel's explanation of rectilinear propagation of light - Fiber optics: Numerical aperture, acceptance angle - Fiber optics communication system - Temperature sensor.

UNIT-II: LASER PHYSICS

Einstein's co-efficients - Spontaneous and stimulated emission - Population inversion - Optical pumping - Condition for Laser action - Semiconductor laser - CO₂ laser - Nd-YAG laser - Applications of laser - Holography - Construction and Reconstruction.

UNIT-III: ATOMIC & NUCLEAR PHYSICS

Atomic physics: Photo electric effect - Einstein photoelectric equation - Coupling schemes – LS & JJ couplings - Zeeman effect – Experiment - Stark effect (definition only) - Nuclear Physics: Detection of nuclear radiation - Geiger Muller counter - Particle accelerators: Betatron - Elementary particles: Leptons, Mesons, and Baryons.

UNIT IV: SEMICONDUCTORS AND OPTOELECTRONICS

Volt - Ampere Characteristics of P-N junction Diode - Zener diode - Applications of Zener diodes - Zener voltage regulator - Optoelectronic devices: Photovoltaic cell - Photoconductive cell - Solar cell – Phototransistor - LED and LCD - Construction and working.

UNIT-V: NUMBER SYSTEM AND DIGITAL ELECTRONICS

Binary, Octal, Hexadecimal - Interconversion - AND, OR, NAND, NOR, XOR, XNOR gates - DeMorgan's theorem - Laws of Boolean algebra - Operation Amplifiers: Ideal characteristics – Inverting - Non inverting op-amp - CMRR – Adder – Subtractor.

BOOKS FOR STUDY:

Unit-I

1. R. Murugesan, *Modern Physics*.
2. R. Murugesan, *Optics and Spectroscopy*.

Unit-II

1. Gaur and Gupta, *Engineering physics*.
2. M. Arumugam, *Engineering physics*.
3. Thiagarajan, *Laser Physics*.

Unit-III

1. R.Murugesan, *Modern Physics*.

Unit-IV

1. V.K. Metha, *Principles of Electronics*.
2. B.L. Theraja, *Basic Electronics*.

Unit-V

1. Morris Mano, *Digital Logic and Computer Design*.
2. Malvino & Leech, *Digital principles and Applications*.

Books for Referances:

1. R.Murugesan, *Allied Physics I&II*.
2. Dr.R.Sabesan & Dr.Mrs. Dhanalakshmi *Allied Physics*.

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Subject Code:

U15ES2

GOVERNMENT ARTS COLLEGE (AUTONOMOUS), KARUR-05
ALL UG COURSES - II SEMESTER – PART – IV
(For the candidates admitted from the year 2015-16 onwards)

ENVIRONMENTAL STUDIES

Unit 1

Environment – Introduction – Nature – Scope – Content – Need for study: Natural resources – Forest and Energy resources – use and over exploitation –deforestation – Energy resources – reviewable and non reviewable energy resources.

Unit 2

Eco System: Concept – Structure and function – Procedures – consumers and decomposers – Food Chains – Food Webs and Ecological Pyramids – Biodiversity and its conservation : Introduction – definition – genetic – species and eco system diversity – conservation of biodiversity.

Unit 3

Environmental Pollution – Definition – causes – effects and control Measures – Types – Air – Water – Soil – Thermal and Nuclear hazards – solid waste and Management – Disaster Management – Role of an individuals in controlling pollution – Earth Quake – Earth Quake and Cyclone – Flood.

Unit 4

Social issues and the environment: urbanization – urban problems related to energy – Water Shed Management – Environmental ethics: issues and possible solutions – Wasteland reclamation – Climate Change – Global Warming - Acid rain – Ozone layer depletion – Public awareness.

Unit 5

Human Population and the environment: Population growth, Variation among nations – Population explosion – Family Welfare Programme – Human rights – HIV/AIDS – Women and Child Welfare – Role of information technology in environment and human health.

Text Book:

1. சுற்றுச்சூழல் கல்வி - முனைவர். ஆ. சசிலா அப்பாத்துரை -
நியூ செஞ்சுரி புக் ஹவுஸ் (பி) லிட், சென்னை.

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COE

Sl. No.:

Subject Code:

U15L3T3

அரசு கலைக் கல்லூரி (தன்னாட்சி) - ஈநர் - 5
கலையியல் / அறிவியல் / வணிகவியல் / பட்ட வகுப்பு
(2015 - 2016 ஆம் கல்வியாண்டு முதல் பயிலும் மாணவர்களுக்குரியது)
பகுதி - 1 பொதுத்தமிழ் - 3 - மூன்றாம் பருவம்
(காப்பியங்கள், நாடகம், இலக்கணம், இலக்கிய வரலாறு)

அலகு 1 காப்பியங்கள்

சிலப்பதிகாரம் (புறஞ்சேரியிறுத்த காதை)
மணிமேகலை (சிறைக்கோட்டம் அறக்கோட்டம் ஆக்கிய காதை)
கம்பராமாயணம் (இரணிய வதைப்படலம்)

அலகு 2 காப்பியங்கள்

பெரியபுராணம் (இளையான்குடி மாற நாயனார் புராணம்)
தேம்பாவணி (நாட்டுப்படலம்)
சீறாப்புராணம் (பாந்தள் வசனித்த படலம்)

அலகு 3 நாடகம்

சேர தாண்டவம் - பாரதிதாசன்

அலகு 4 இலக்கணம்

நிறுத்தக் குறிகள்

அலகு 5 இலக்கிய வரலாறு

காப்பியங்கள், நாடகம்

பரிந்துரை நூல்

முனைவர் கா.வாசுதேவன் - பன்முக நோக்கில் தமிழ் இலக்கிய வரலாறு
தேவன் பதிப்பகம், 16/43, திருநகர்,
திருவானைக்கோவில், திருச்சி

ஐந்து அலகுகளிலும் சம அளவில் வினாக்கள் அமைதல் வேண்டும்.

வினாத்தாள் அமைப்பு முறை

பகுதி அ (ஒரு மதிப்பெண் வினா - 20)

- | | |
|--|-------|
| அ) பொருத்தமான விடையைத் தேர்ந்தெடுத்தல் | 5*1=5 |
| ஆ) கோடிட்ட இடங்களை நிரப்புதல் | 5*1=5 |
| இ) பொருத்துதல் | 5*1=5 |
| ஈ) ஒரிரு சொற்களில் விடையளித்தல் | 5*1=5 |

பகுதி ஆ (ஐந்து மதிப்பெண் வினா)

இது அல்லது அது என்ற வகையில் அமைதல் வேண்டும் 5*5=25

பகுதி இ (பத்து மதிப்பெண் வினா)

ஐந்தில் எவையேனும் மூன்றனுக்கு மட்டும் கட்டுரை வடிவில் விடை எழுத வேண்டும். 3*10=30

மொத்த மதிப்பெண் -75

Sl. No.:

Subject Code:

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR- 05

ALL UG COURSES - III SEMESTER - PART – II - ENGLISH

(For the candidates admitted from the year 2015-16 onwards)

ENGLISH – III

Unit I

- | | | |
|--------------------------|---|---------------|
| A Prayer for My Daughter | - | W.B Yeats |
| A Poison Tree | - | William Blake |

Unit II

- | | | |
|--------------------------------------|---|-----------------|
| Stopping by Woods on a Snowy Evening | - | Robert Frost |
| Because I Could Not Stop For Death | - | Emily Dickinson |

Unit III

- | | | |
|--|---|---------------|
| My Grand Mother's House | - | Kamala Das |
| Small Scale Reflections on a Great House | - | A.K Ramanujan |

Unit IV

1. Error Correction
2. One word Substitution
3. Idioms and Phrases

Unit V

1. Comprehension
2. Note Making and Summarizing
3. Précis Writing

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U15CH3C4

GOVERNMENT ARTS COLLEGE (AUTONOMOUS): KARUR-05

B.Sc., CHEMISTRY - III SEMESTER – CORE COURSE - IV

(For the candidates admitted from the year 2015-16 onwards)

GENERAL CHEMISTRY- III

UNIT- I INORGANIC CHEMISTRY (15 hours)

- 1.1 Principle of qualitative analysis Solubility Product principle of elimination of interfering radicals, common ion effect, complexation reactions including spot tests in qualitative analysis.
- 1.2 Nitrogen family: Comparative study of nitrogen family elements and their compounds (Oxides, Halides, Hydrides and Oxyacids).
- 1.3 Zero Group Elements
Compounds of Xenon – XeF_2 , XeF_4 , XeF_6 , XeO_3 and XeOF_4 – preparation, properties, structure and uses.

UNIT-II Metals and Metallurgy:

- 2.1 Occurance of metals – concentration of ores – froath floatation, magnetic separation, Calcination, roasting, Smelting, alumino thermic Process.
- 2.2 Purification of metals – electrolysis, Zone refining, vanArkal de Boer methods
- 2.3 Mineral Wealth of India – Important minerals found in India (Magnetite, Haematite, Pyrolusite, Bauxite, Magnesite, dolomite, Gypsum, ilmenite, Monazite, pitch blende, Mica, and Common Salt) Minerals exported from and imported to India.

UNIT - III (Organic Chemistry) (15 hours)

- 3.1 Conformational analysis of ethane and n-butane with energy diagrams. Conformation of cyclohexane (boat, chair and Skew – boat forms) – Axial and equatorial bonds ring flipping.
- 3.2 Aromatic hydrocarbons: Structure and Stability of benzene ring – resonance in benzene – delocalized pi – electron cloud in benzene.
- 3.3 Aromaticity: Huckel's rule with example like cyclopropenyl cation, benzene, naphthalene, anthracene, furan, thiophene, Pyridine, ferrocene and azulene

UNIT – IV (Organic Chemistry) (15 Hrs)

- 4.1 Electrophilic, Nucleophilic and free radical Substitution reactions in aromatic compounds.
General mechanism of electrophilic substitution reaction – nitration, Sulphonation, halogenation, Friedel – Craft's alkylation and acylation reactions – Effect of Substituents – Activating and Deactivating groups Orientation effect.
- 4.2 Aromatic nucleophilic substitution reaction – Benzyne mechanism, Intermediate Complex formation mechanism.

UNIT - V (Physical Chemistry) (15 Hrs)

- 5.1 V.B.Theory postulates –Overlap of atomic orbitals and principles of hybridization.
- 5.2 M.O.theory – bonding, antibonding molecular orbitals – MO diagrams of simple homonuclear diatomic molecules (H_2 , H_2^+ , He_2 , Li_2 , B_2 , C_2 , O_2 , N_2 and F_2) and hetero nuclear diatomic molecules (HF and CO).
- 5.3 Comparison of VB and MO Theories.
- 5.4 Heisenberg's uncertainty principle – Schrodinger wave equation – Eigen values and Eigen functions – Significance of ψ and ψ^2 – Concept of orbitals and Shapes of Orbitals.

Books Recommended:

1. P.L.Soni and Mohan Katyal, "Text Book of Inorganic chemistry" 20th Revised Edition, Shoban Lal Nagin Chand & Co New Delhi.1993.
2. R.B.Pori and I.R.Sharma, K.C.Kaila, "Principle of Inorganic Chemistry" sultan Chand and Co New Delhi. 1992.
3. Vogel's "Text Book of qualitative Chemical Analysis" 6th Edition ELBS, Derling Kinderslay (India) Pvt Ltd New Delhi-2006.
4. R.D.Madan, "Modern Inorganic Chemistry", S.Chand & Co (Pvt) Ltd. New Delhi.1997
5. M.K.Jain, "Organic Chemistry", 12th Edition Shoban Lal Nagin chand and Co. New Delhi 1987.
6. P.L.Soni and H.M.Chawla, "Text Book of Organic Chemistry", 23rd Edition Sultan Chand Co. New Delhi 1990.
7. K.S.Tewari S.N.Mehrotra and N.K.Vishnol, "A Text Book of Organic Chemistry", 3rd Edition, Vikas publishing House (Pvt) Ltd. New Delhi 2006.
8. R.K.Prasad, "Quantum Chemistry" New Age International (P) Ltd. Publishers 1996.
9. B.R.Puri, L.R.Sharma and Madan S.Pathania, 41st Edition, "Principle of Physical chemistry" Vishal Publishing. Co, New Delhi, 2004.

Sl. No.:

Subject Code:

U15MM3A1

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05**B.Sc., – I & III – SEMESTER - FIRST/SECOND ALLIED COURSE - I****(FOR CHEMISTRY AND PHYSICS MAJOR)**

(For the candidates admitted from 2015 - 2016 onwards)

ALLIED MATHEMATICS-I**CALCULUS AND FOURIER SERIES**

UNIT 1: Successive Differentiation – n^{th} derivative of standard functions (Derivation not needed) Simple problems only - Leibnitz theorem (proof not needed) and its applications. Curvature and radius of curvature in Cartesian Coordinates only (proof not needed) - Jacobians of two & three variables - Simple problem only.

UNIT 2: Integrating by parts – Bernoulli's formula - Evaluation of integrals of types

$$1. \int \frac{dx}{a+b\cos x} \quad 2. \int \frac{dx}{a+b\sin x} \quad 3. \int \frac{(a\cos x + b\sin x + c)}{(p\cos x + q\sin x + r)} dx$$

UNIT 3: General Properties of Definite integrals - Evaluation of Definite integrals of types

$$1. \int_a^b \sqrt{(x-a)(b-x)} dx \quad 2. \int_a^b \frac{dx}{\sqrt{(x-a)(b-x)}} \quad 3. \int_a^b \sqrt{\frac{(x-a)}{(b-x)}} dx$$

Reduction formula when n is a positive integer for

$$1. \int_a^b e^{ax} x^n dx \quad 2. \int_a^b \sin^n x dx \quad 3. \int_a^b \cos^n x dx \quad 4. \int_a^{\pi/2} \cos^n x dx$$

$$5. \int_0^{\pi/2} \sin^n x dx \quad 6. \int_0^{\pi/2} \sin^m x \cos^n x dx \text{ (proof not needed for 6 only).}$$

UNIT 4: Evaluation of Double and Triple integral in simple cases – Changing the order and Evaluating the Double integration. (Cartesian Coordinates only)

UNIT 5: Definition of Fourier series - Finding Fourier Co-efficients for a given periodic function with period 2π - Use of Odd and Even functions in evaluation of Fourier Co-efficients - Half range sine and cosine series.

TEXT BOOKS:

1. T. K. Manickavasagam Pillai, S. Narayanan, "Calculus Vol. I" S. Viswanathan Private Limited, 2011.
2. S. Arumugam, Issac and Somasundaram, "Trigonometry and Fourier series", New Gamma Publishers, Hosur, 1999.

CHAIRMAN

COE

Sl. No.:

Subject Code:

U15ZO3A1

GOVERNMENT ARTS COLLEGE (AUTONOMOUS), KARUR-5
B.Sc., BOTANY & CHEMISTRY – III SEMESTER – ALLIED COURSE - I
(For the candidates admitted from the year 2015-16 onwards)

ALLIED ZOOLOGY - I
(INVERTEBRATA AND CHORDATA)

- UNIT- I** General Characters of the Phyla based on the following types
Phylum Protozoa – *Paramecium*
Phylum Porifera – Acon Sponges
Phylum Coelenterata – *Obelia Sp.*
- UNIT- II** General Characters of the Phyla based on the following types.
Phylum Platyhelminthes – *Fasciola hepatica*
Phylum Nematelminthes – *Ascaris lumbricoides*
Phylum Annelida – *Megascolex Sp.*
- UNIT-III** General Characters of the Phyla based on the following types
Phylum Arthropoda – *Penaeus Sp.*
Phylum Mollusca – *Lamellidens Sp.*
Phylum Echinodermata – *Asterias Sp.*
- UNIT-IV** General characters of the classes based on the following types
Class Pisces – *Scoliodon*; Class Amphibia – *Rana*; Class Reptilia – *Calotes* – Morphology, digestive, respiratory, circulatory, nervous system, sense organs, excretory and reproductive system.
- UNIT-V** General Characters of the classes based on the following types.
Class Aves – *Columba*; Class Mammalia – *Oryctolagus* – Morphology, digestive, respiratory, circulatory, nervous system, sense organ, excretory and reproductive system.

Text Books:

1. Text Book of Invertebrates, Arumugam, N. Saras Publications, Nagercoil
2. Text book of Chordates, Arumugam, N. Saras Publications, Nagercoil.

Reference Books:

1. Outlines of Zoology – M. Ekambaranatha Ayyar – Viswanathan Publications.
2. A Manual of Zoology, Vol -I & II M. Ekambaranatha Ayyar – Viswanathan Publications.

CHAIRMAN – BOS

COE

Sl. No:

Subject Code:

U15PH3N1

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

B.sc., -III SEMESTER – NON CORE ELECTIVE-I

(For the candidates admitted from the year 2015-2016 onwards)

(FOR CHEMISTRY MAJOR)

ENERGY PHYSICS-I

UNIT-I: CONVENTIONAL ENERGY SOURCES

Various forms of energy - Renewable and conventional energy system – Comparisons - Coal, oil and Natural Gas - Availability - Statistical details - Worlds reserve of commercial energy sources and their availability.

UNIT-II: NON- CONVENTIONAL ENERGY SOURCES

Renewable energy sources - Solar energy- Structure of the Sun - Nature of the radiation - Terrestrial radiation - Solar heaters - Domestic and commercial type - Crop driers- Direct and indirect type - Space cooling- Vapour compression system and Absorption air conditioning – Solar cooker – Box type and Multi reflector type solar cooker.

UNIT-III: PHOTO CONVERSION:

Photovoltaic generation - Principle of Solar cell- Current Voltage characteristics - Types of solar cells - p-n Homo junction cell – p-n- Hetro junction cell - Gallium Arsenide solar cell - Indium Phosphide solar cell.

UNIT-IV: WATER DESALINATION- SOLAR STILL:

Water desalination - Principle of solar distiller - Single slope basic solar still - Double slope solar still - Non symmetrical solar still – Symmetrical solar still - Performance of solar distillation - Solar pond - Merits and demerits of solar energy.

UNIT-V: BIO MASS ENERGY:

Bio mass energy - Classification of bio mass energy - Photo synthesis - Bio mass conversion - Direct and indirect method - Gobar gas plants - Ethanol from wood- Merits and demerits.

BOOKS FOR STUDY:

1. G.D. RAI, *Non conventional energy sources* - Khanna publishers, 2008.

BOOKS FOR REFERENCE:

1. G.D. RAI “ *Solar energy utilization*”- Ed - V(1995).
2. S.P. SAKHATURE, “ *Solar energy*”- TATA MCGRAW Till publication company, Ed., 11, 1997.
3. C.G. Agerwal, *Solar energy*.
4. KARUPANNAN. K and SUGANTHI, *Energy physics*- PRIYA publication.

CHAIRMAN-BOS

COE

Sl. No.:

Subject Code:

U15L4T4

அரசு கலைக் கல்லூரி (தன்னாட்சி) - ஈரூர் - 5
கலையியல் / அறிவியல் / வணிகவியல் / பட்ட வகுப்பு
(2015 - 2016 ஆம் கல்வியாண்டு முதல் பயிலும் மாணவர்களுக்குரியது)
பகுதி - 1 பொதுத்தமிழ் - 4 - நான்காம் பருவம்
(சங்க இலக்கியம், புதினம், இலக்கணம், இலக்கிய வரலாறு)

அலகு 1

நற்றிணை - 5,21,27,80,92
குறுந்தொகை -10 பாடல்கள் (2,16,20,40,62,67,202,244,263,286)
ஐங்குறுநூறு (அன்னாய் வாழிப்பத்து)
அகநானூறு - 2 பாடல்கள் (10,23)
புறநானூறு - 5 பாடல்கள் (74,192,204,206,312)
கலித்தொகை- 2 பாடல்கள் (11,88)

அலகு 2

சிறுபாணாற்றுப்படை (முழுவதும்)

அலகு 3

பூர்வீக பூமி - தூரியகாந்தன்

அலகு 4

கட்டுரை
பொதுக்கட்டுரை, விண்ணப்பம், மடல், அலுவலகக் கடிதங்கள் எழுதப் பழகுதல்

அலகு 5

இலக்கிய வரலாறு - சங்க இலக்கியம், புதினம்

பரிந்துரை நூல்

முனைவர் கா.வாசுதேவன் -பன்முக நோக்கில் தமிழ் இலக்கிய வரலாறு
தேவன் பதிப்பகம்,16/43, திருநகர்,
திருவானைக்கோவில்,திருச்சி

ஐந்து அலகுகளிலும் சம அளவில் வினாக்கள் அமைதல் வேண்டும்.

வினாத்தாள் அமைப்பு முறை

பகுதி அ (ஒரு மதிப்பெண் வினா - 20)

- | | |
|--|-------|
| அ) பொருத்தமான விடையைத் தேர்ந்தெடுத்தல் | 5*1=5 |
| ஆ) கோடிட்ட இடங்களை நிரப்புதல் | 5*1=5 |
| இ) பொருத்துதல் | 5*1=5 |
| ஈ) ஒரே சொற்களில் விடையளித்தல் | 5*1=5 |

பகுதி ஆ (ஐந்து மதிப்பெண் வினா)

இது அல்லது அது என்ற வகையில் அமைதல் வேண்டும் 5*5=25

பகுதி இ (பத்து மதிப்பெண் வினா)

ஐந்தில் எவையேனும் மூன்றனுக்கு மட்டும் கட்டுரை வடிவில் விடை தருக. 3*10=30
மொத்த மதிப்பெண் -75

Sl. No.:

Subject Code:

U15L4E4

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR- 05

ALL UG COURSES - IV SEMESTER - PART – II - ENGLISH

(For the candidates admitted from the year 2015-16 onwards)

ENGLISH – IV

Unit I

- Grand Mother's Gold - Ella Adkins
Medieval Magic - Geoffrey Chaucer

Unit II

- The little Man - John Galsworthy
The Pot of Broth - W.B Yeats

Unit III

- The Proposal - Anton Checkov
The Bishop's Candle Sticks - Norman Mc Kinnell

Unit IV

1. Letter Writing
2. Developing Hints
3. Complete the Dialogue

Unit V

1. Essay
2. Group Discussion
3. Interview Techniques

Sl. No.:

Subject Code:

U15CH4C5P

GOVERNMENT ARTS COLLEGE (AUTONOMOUS):: KARUR-05
B.Sc., CHEMISTRY - IV SEMESTER – CORE COURSE - V

(For the candidates admitted from the year 2015-16 onwards)

CORE COURSE PRACTICAL -II

Analysis of a mixture containing two cations and two anions of which one will be an interfering.

CATIONS TO BE STUDIED: Lead, Copper, Bismuth, Cadmium, Iron, Aluminum, Zinc
Manganese, Cobalt, Nickel, Barium, Calcium, Strontium, Magnesium and Ammonium.

ANIONS TO BE STUDIED: Carbonate, Sulphide, Sulphate, Nitrate, Chloride, Bromide, Fluoride, Borate, Oxalate and Phosphate.

Marks:

Int.Asst.	25
Practical	75

Total	100

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COE

Sl. No.:

Subject Code:

U15CH4C6

GOVERNMENT ARTS COLLEGE (AUTONOMOUS): KARUR-05

B.Sc., CHEMISTRY - IV SEMESTER – CORE COURSE - VI

(For the candidates admitted from the year 2015-16 onwards)

GENERAL CHEMISTRY – IV

UNIT- I INORGANIC CHEMISTRY (15 hours)

Alkali and Alkaline earth metals.

- 1.1 Comparative study of metal and alkaline earth metal compounds (Oxides, Halides, Hydrides, carbonates, and Sulphates).
- 1.2 Diagonal relationship between lithium and magnesium.
- 1.3 Preparation, Properties and uses of Lithium aluminium hydride and sodium borohydride. Coinage metals.
- 1.4 Comparative study of Zinc group metals, Galvanisation, Evidences for the existence of mercurous ion as Hg_2^{2+}

UNIT-II Inorganic Chemistry

Inner Transition Elements

- 2.1 Lanthanides – occurrence – general study of lanthanides involving electronic Configuration, Oxidation states, Magnetic properties and Complexation behavior – Lanthanide contraction.
- 2.2 Extraction of Uranium
- 2.3 Actinides – Occurrence – electronic Configuration, Oxidation states, Magnetic properties and Complexation behaviour.

UNIT - III (Organic Chemistry) (15 hours)

- 3.1 Aliphatic and nucleophilic substitutions – Mechanism of SN_1 , SN_2 , and SN^i reactions and Effect of Solvents, leaving groups nucleophiles and Structure of substrates.
- 3.2 Elimination reaction – Hofmann and Saytzeff's eliminations cis and trans eliminations – Mechanism of E_1 and E_2 reactions.

UNIT – IV (Organic Chemistry) (15 Hrs)

- 4.1 Unsaturated alcohol – Alkyl alcohol – Preparation, Properties and uses.
- 4.2 Thio alcohols – Preparation, Properties and uses of ethyl mercaptan.
- 4.3 Ethers: Aliphatic and aromatic ethers – Preparation, properties and uses, 1,4 – dioxane and crown ethers – preparation, properties and uses, Epoxides – preparation reactions and applications.

UNIT - V (Physical Chemistry) (15 Hrs)

- 5.1 Polarization-Induced polarization- Orientation polarization
- 5.2 Determination of dipole moment by temperature method. Application of dipole moment measurements – in distinguishing between cis and trans isomers in determining the percent ionic character of bonds – Shapes of simple inorganic and organic molecules (BCl_3 , H_2O , CO_2 , NH_3 , CCl_4) Dipole moment of substituted benzene (o,m and p dichloro benzene)

Books Recommended:

1. P.L.Soni and Mohan Katyal, "Text Book of Inorganic chemistry" 20th Revised Edition, Shoban Lal Nagin Chand & Co New Delhi.1993.
2. R.B.Puri and I.R.Sharma, K.C.Kaila, "Principle of Inorganic Chemistry" sultan Chand and Co New Delhi. 1992.
3. Vogel's "Text Book of qualitative Chemical Analysis" 6th Edition ELBS, Derling Kinderslay (India) Pvt Ltd New Delhi-2006.
4. R.D.Madan, "Modern Inorganic Chemistry", S.Chand & Co (Pvt) Ltd. New Delhi.1997
5. M.K.Jain, "Organic Chemistry", 12th Edition Shoban Lal Nagin chand and Co. New Delhi 1987.
6. P.L.Soni and H.M.Chawla, "Text Book of Organic Chemistry", 23rd Edition Sultan Chand Co. New Delhi 1990.
7. K.S.Tewari S.N.Mehrotra and N.K.Vishnoi, "A Text Book of Organic Chemistry", 3rd Edition, Vikas publishing House (Pvt) Ltd. New Delhi 2006.
8. B.R.Puri, L.R.Sharma and Madan S.Pathania, 41st Edition, "Principle of Physical chemistry" Vishal Publishing. Co, New Delhi, 2004.

Sl. No.: Subject Code:

U15MM4A2

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

B.Sc., – II & IV – SEMESTER – FIRST / SECOND ALLIED COURSE - II
(FOR CHEMISTRY AND PHYSICS MAJOR)
(For the candidates admitted from 2015 -16 onwards)

ALLIED MATHEMATICS – II

ALGEBRA, 3D AND TRIGONOMETRY

- UNIT 1:** Binomial, Exponential and Logarithmic series (Formulae only) - Summation and approximation related problems.
- UNIT 2:** Symmetric, Skew symmetric, Orthogonal, Hermitian, Skew Hermitian and Unitary matrices - Characteristic equation, Eigen values, Eigen vectors - Cayley Hamilton's theorem(proof not needed) - Simple problems only.
- UNIT 3:** Equation of a Sphere -Tangent plane - Plane section of a sphere - Finding the center and radius of the circle of intersection (simple problems only).
- UNIT 4:** Expansion of $\sin n\theta$, $\cos n\theta$, $\tan n\theta$ (n being a positive integer) - Expansion of $\sin^n \theta$, $\cos^n \theta$, $\sin^n \theta \cos^n \theta$ in a series of sines and cosines of multiples of θ (θ - gives in radians) - Expansion of $\sin \theta$, $\cos \theta$ and $\tan \theta$ in terms of powers (only problems in all the above)
- UNIT 5:** Euler's formula for $e^{i\theta}$ - Definition of Hyperbolic functions – Formulae involving Hyperbolic functions - Relation between Hyperbolic and circular functions - Expansion of $\sinh x$, $\cosh x$, $\tanh x$ in powers of x – Separation of real and imaginary part of $\sin(x+iy)$, $\cos(x+iy)$, $\tan(x+iy)$, $\sinh(x+iy)$, $\cosh(x+iy)$, $\tanh(x+iy)$, $\sinh^{-1}(x+iy)$, $\cosh^{-1}(x+iy)$, $\tanh^{-1}(x+iy)$.

TEXT BOOKS:

1. T. K. Manickavasagam Pillai, T. Natarajan, K. S. Ganapathy, “**Algebra Vol. I**” S. Viswanathan Private Limited, Chennai-2010.
2. S. Narayanan, T. K. Manickavasagam Pillai, “**Trigonometry**” S. Viswanathan Private Limited and Vijay Nicole Imprints Pvt. Ltd.2010.
3. T. K. Manickavasagam Pillai, “**Analytical Geometry of 3D and Vector Calculus**”, New Gamma Publishing House, 2010.

REFERENCE BOOKS:

1. Arumugam & Isaac, “**Analytical geometry of 3D and Integral calculus**”, New Gamma Publications, 2011.
2. Arumugam & Isaac, “**Trigonometry and Fourier series**”, New Gamma Publications.

CHAIRMAN

COE

Sl. No.:

Subject Code:

GOVERNMENT ARTS COLLEGE (AUTONOMOUS), KARUR-5
B.Sc. BOTANY & CHEMISTRY – IV SEMESTER – ALLIED COURSE II
(For the candidates admitted from the year 2015-16 onwards)

ALLIED ZOOLOGY – II PRACTICAL

1. DISSECTIONS:

Earth worm – Nervous System.

Cockroach – Digestive System, Nervous System.

2. MOUNTINGS:

Earthworm – Body setae

Cockroach – Mouth Parts.

Honey Bee – Mouth Parts.

Shark – Placoid Scales

Any Carp – Cycloid & Ctenoid Scales.

3. SPOTTERS:

Amoeba, Paramoecium, Ascon sponge, Obelia colony, Metridium, Fasciola hepatica, Taenia solium, Taenia scolex, Planaria, Ascaris, Earthworm, Earthworm T. S., Nereis, Leech, Leech T.S, Prawn, Scorpion, Grasshopper, Centipede, Peripatus, Freshwater mussel, Pila, Sepia, Sea-star, Sea-urchin, Sea-cucumber, Amphioxus, Ascidian, Balanoglossus, Shark, Anabas, Exocoetus, Echineis, Frog, Salamander, Calotes, Draco, Turtle, Naja Naja, Vipera russellii, Pigeon, Parrot, Rat, Rabbit, Bat.

4. Species of animals used in Vermiculture, Apiculture, Sericulture, Aquaculture and Poultry farming.

5. Products: Vermicompost, Honey, Bee's wax, Silk, Cod liver oil, Abnormal Eggs of poultry birds.

A record of laboratory work should be submitted at the time of Practical examination.

Mark distribution for the Practical Examination:

1. Dissection	: 25
2. Mounting	: 15
3. Spotters (5x5)	: 25
4. Record	: 10
Total	: 75

CHAIRMAN – BOS

COE

Sl. No.:

Subject Code:

U15MM4A3

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

B. Sc.,-II & IV SEMESTER – FIRST/SECOND ALLIED COURSE - III (FOR CHEMISTRY & PHYSICS MAJOR)

(For the candidates admitted from 2015-2016 onwards)

ALLIED MATHEMATICS – III

DIFFERENTIAL EQUATIONS, LAPLACE TRANSFORMS AND VECTOR CALCULUS

- UNIT 1:** Ordinary Differential Equations of first Order but of Higher Degree – Equation solvable for x, solvable for y, solvable for dy/dx , Clairaut's form (Simple case Only) – Linear Equations with constant coefficients – Finding Particular Integral in the case of e^{kx} $\sin(kx)$, $\cos(kx)$ (Where k is constant), X^k Where k is a positive integer, and $e^{kx} f(x)$ Where f(x) is any function of x (only problems in all the above – no proof needed for any formula)
- UNIT 2:** Formation of Partial Differential Equations by Eliminating arbitrary constants and by Elimination of arbitrary functions – Definition of general, particular and complete solutions – singular integrals (geometrical meaning not required) – Solution of First Order Equations in standard forms: $f(p, q) = 0$, $f(y, p, q) = 0$, $f(z, p, q) = 0$, $f_1(x, p) = f_2(y, q)$, $z = xp + yq + f(p, q)$ – (only problems in all the above – Proof not needed for any formula)
- UNIT 3:** Laplace Transforms: Definition – $L f(t)$, $L (\cos (at))$, $L (\sin (at))$, $L (\sin t^n)$ Where n is a positive integer, Basic theorems in Laplace Transforms (Formula only) – $[e^{at} f(t)]$, $L[e^{at} \cos bt]$, $L[e^{at} \sin bt]$ – Inverse Laplace Transforms related to the above standard forms solving second order ODE with constant co-efficient using Laplace transforms.
- UNIT 4:** Vector Differentiation – Velocity and Acceleration vectors- Gradient of the vectors – Directional derivatives – Unit normal Vector – Tangent plane – Divergence – Curl – Solenoidal and irrotational vectors – Double operators – Properties connecting grad., div and curl of a vector.
- UNIT 5:** Vector Integration – Line Integral – Conservative force field - Scalar potential field – Work done by a force – Surface integral – (Statement, Application and verification only) - Gauss Divergence theorem, Stoke's theorem, Green's theorem.

TEXT BOOKS:

1. S. Narayanan, “**Differential Equation**”, S. Viswanathan Publishers, 1996.
2. S. Narayanan, T. K. Manickavasagam Pillai, “**Calculus Vol. II**”, S. Viswanathan Pvt. Limited, 2003.
3. M. L. Khanna, “**Differential Calculus**”, Jaiprakashnath and Co., Meerut -2004.

REFERENCE BOOK:

1. Kandasamy, Thilagavathy, Gunavathy, “**Allied Mathematics Vol. II**”, S. Chand & Company Limited, New Delhi 2010.

CHAIRMAN

COE

Sl. No.:

Subject Code:

U15ZO4A3

GOVERNMENT ARTS COLLEGE (AUTONOMOUS), KARUR-5
B.Sc. BOTANY & CHEMISTRY – IV SEMESTER - ALLIED COURSE - III

(For the candidates admitted from the year 2015-16 onwards)

ALLIED ZOOLOGY – III
(COMMERCIAL ZOOLOGY)

- UNIT- I** Vermiculture and composting – Types of earthworm – Significance – Rearing – Rearing technology – Management – Economic importance – Composting.
- UNIT- II** Apiculture – Species of Honey bees – Newton’s Bee hive – Care and management – Honey extraction – Economic importance – Nutritive and medicinal values of honey.
- UNIT-III** Sericulture – Feeding habits of larvae – Life cycle of silk worm (*Bombyx mori*) – Economic importance of silk worm and silk.
- UNIT-IV** Aquaculture – Construction of pond – Management of pond – Freshwater cultivable fishes – Fish feed – Induced breeding – fish diseases (Furunculosis, Epizootic Ulcerative syndrome (EUS) and Vibriosis).
- UNIT-V** Poultry farming – types of poultry – Management – Poultry nutrition – diseases and their prevention – Economics of poultry production.

Text Book:

1. G.S. Shukla and V.B. Upadhyay – Economic Zoology, Rastogi Publications.
2. Thiyagarajan, S. 2000 – Commercial Zoology, Tee Jay Publication, Thanjavur (Tamil version)

Reference Books:

1. Ashan, J. and S.P. Sinha – A hand book of Economic zoology – S. Chand & Co
2. Sardar Singh – Bees Keeping in India, ICAR, New Delhi, 1982.
3. Santhanam, et al., 1999, Aquaculture, Oxford & IBH Pub. Co., Pvt. Ltd, New Delhi.
4. Ullal, S.R. and M. N. Narasimhan – Central Silk Board, Government of India, Mumbai
5. Singh – Livestock and Poultry Production
6. Manju Yadav, 2003. Economic zoology, Discovery Publishing House, New Delhi
7. Rose, S.P., Principles of Poultry science, C & B International
8. Ismail. S., 2001, Vermiculture, Orient Longman Ltd., Chennai

CHAIRMAN – BOS

COE

Sl. No.:

Subject Code:

U15CH4S1

GOVERNMENT ARTS COLLEGE (AUTONOMOUS): KARUR-05
B.Sc., CHEMISTRY – IV SEMESTER –SKILL BASED ELECTIVE -I

(For the candidates admitted from the year 2015-16 onwards)

LABORATORY HYGIENE AND SAFETY

- UNIT- I**
(6 hours) 1.2 Laboratory safety measures: Lab discipline – Cleanliness and watchfulness. Maintenance of worktable, washing sink, fume hoods, fuel gas systems, instruments and equipments – Requirements for a safe laboratory. Use of apron overcoats, goggles gloves, etc.,
- UNIT –II**
(6 hours) 2.1 Storage and handling of chemicals – carcinogenic chemicals – Handling of ethers – toxic and poisonous chemicals.
- UNIT-III**
(6 hours) 3.1 Safe limits of vapour concentrations – Waste disposal and fume disposal – Precautions for avoiding accidents – cleansing agents – cleaning the apparatus and Instruments.
- UNIT – IV**
(6 hours) 4.1 First – Aid techniques: Burns and Damages due to organic substances, acids, alkalis, burns in the eye- Inhalation of toxic vapours, hazardous chemicals, bromine, phenol and hot objects.
- UNIT- V**
(6 hours) 5.1 Poisons and antidotes – Rules to avoid poisoning – emetics- universal antidote – treatments for specific poisons. Harmful effects of X-rays and lasers.

Books Recommended:

3. V.Gopalan, P.S.Subramaniam and K.Rengarajan, Elements of Analytical Chemistry.
4. Jayashree Ghosh, A Text Book of Pharmaceutical Chemistry.

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

B.sc., - IV SEMESTER – NON CORE ELECTIVE - II

(For the candidates admitted from the year 2015-2016 onwards)

(FOR CHEMISTRY MAJOR)

ENERGY PHYSICS-II

UNIT-I: WIND ENERGY

Wind energy - Calculating the power from the wind – Horizontal - Axis wind mill - Single blade wind mill - bicycle wheel wind mill - Horizontal axis wind mill - Dutch type - sail type - Vertical Axis wind mill- Performance of wind mill- Merits and demerits.

UNIT-II: OTHER ENERGY SOURCES - I

Geothermal energy - Ocean Thermal Energy Conversion (OTEC) - open cycle – closed cycle- Energy from the waves – Principle – High level Reservoir wave machine - Dolphin-type wave power machine - and Tide energy – Principle - Tidal power plants – Single basin system – One way cycle – Two way cycle - Merits and demerits.

UNIT-III: OTHER ENERGY SOURCES -II

Nuclear power - Fusion and Fission - Breeder reactor nuclear fusion - Basic principles of magneto- Hydro - Dynamics - Solar production of Hydrogen - Liquid hydrogen as a Fuel in future - Merits and demerits.

UNIT-IV: ENERGY STORAGE

Solar energy storage- Thermal, Electrical, Chemical, Mechanical – Hydrogen storage – compressed Gas storage – Liquid storage – underground storage – Storage as metal hydrides

UNIT-V: IMPACTS OF NON- CONVENTIONAL ENERGY

Conversions of energy - Patterns of energy consumption in domestic, Industrial, Transportation and Agricultural sectors - Conservation Principles - Energy crisis and possible solutions - Energy option for the developing countries - Impacts due to non - Conventional energy sources - Global warming.

BOOKS FOR STUDY:

1. G.D. RAI, *Non conventional energy sources* - Khanna publishers, 2008.

BOOKS FOR REFERENCE:

1. H.P.GARG and J.PRAKASH, *Solar energy fundamental and application* - TATA MCGRAW- HILL publishing company limited, 1997.
2. KARUPANNAN. K and SUGANTHI, *Energy physics* - PRIYA publication.

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS): KARUR-05

B.Sc., CHEMISTRY - V SEMESTER – CORE COURSE - VII

(For the candidates admitted from the year 2015-16 onwards)

INORGANIC CHEMISTRY - I

- UNIT- I Coordination compounds**
1.1 Types of ligands. IUPAC nomenclature
Theories of coordination compounds – Werner, Sidgwick, Valence bond, Crystal field, molecular orbital and ligand field theories.
- UNIT –II**
2.1. Isomerism – Stability of complexes – factors affecting the stability of complexes.
2.2 Unimolecular and bimolecular nucleophilic substitution reactions in octahedral and square complexes – Trans effect.
2.3 Application of coordination compounds – Determination of potassium ions, separation of copper cadmium ions, Estimation of nickel using DMG and aluminium using oxine.
- UNIT-III**
3.1 Biologically important coordination compounds – Chlorophyll, haemoglobin, Vitamin B₁₂ – Their structure, application (Elucidation is not required)
3.2 Metal carbonyls – Mono and poly nuclear carbonyls of Ni, Fe and Cr – Synthesis, reactions, structure and uses.
3.3 Nitrosyl compounds – classification, preparation, properties and structure of nitrosyl chloride and sodium nitroprusside.
- UNIT – IV**
4.1 Binary compounds – hydrides, borides and carbides – classification, preparation, properties and uses.
4.2 Organometallic compounds of alkenes alkynes and cyclopentadiene.
- UNIT - V 5.1 GRAVIMETRIC ANALYSIS**
Characteristics of precipitating agent – choice of precipitants – specific and selective precipitant.
Condition of precipitation. Types of precipitations. Purity of precipitant Coprecipitation and post precipitation. Precipitation from homogeneous solution. Digestion and washing of precipitate. Ignition of the precipitate. Use of sequestering agents.
5.2 GROUP THEORY AND ITS APPLICATIONS
Symmetry elements – symmetry operation – mathematical group multiplication tables point group of simple molecules (H₂, HCl, CO₂, H₂O, BF₃, NH₃)

Books Recommended:

1. P.L.Soni Text book of Inorganic Chemistry, S.Chand & Co., New Delhi(1999).
2. B.R.Puri and I.R.Sharma, "Principles of Inorganic Chemistry" shoban Lal, Nagin Chand &Co., New Delhi. 2000.
3. R.D.Madan, G.D.Tuli and S.M.Malik, Selected Topic in Inorganic Chemistry, S.Chand &Co., New Delhi (1988)
4. J.D.Lee., Concise Inorganic Chemistry, E.L.B.S., IV Edn, m(1991)
5. Jeffery et al."Vogel Text Book of Inorganic Quantitative Analysis", Longman (1984)
6. D.A.Skoog and D.M.West: "Fundamentals of Analytical Chemistry W.B.Saunders, New York (1983).
7. P.K.Bhattacharya: Chemical Application of Group Theory, Himalaya publishing House, Mumbai.(1998)
8. F.A.Cotton, Chemical Application of Group Theory, Third Edition, JohnWiley and Son , New York 2002.
9. M.S.Gopinath and V.Ramakrishnan: Group Theory and Applications (1988)
10. D.F.Shriver and P.W.Atkins, "Inorganic Chemistry " IIIrd Edition, Oxford University Press, 1999.
11. M.C. Day and Selbin, "Theoretical Inorganic Chemistry ", Second Edition; Affiliated East – West New Delhi, 1969..

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS): KARUR-05

B.Sc., CHEMISTRY - V SEMESTER – CORE COURSE - VIII

(For the candidates admitted from the year 2015-16 onwards)

ORGANIC CHEMISTRY – I

UNIT-I STEREOCHEMISTRY - I

1.1 Stereoisomerism – Definition – classification into optical and geometrical isomerism.

1.2 Optical isomerism – optical activity – optical specific rotation – conditions for optical activity. Asymmetric centre – chirality – archiral molecule – meaning of + and – and D and L notations – notation for optical isomers – Cahn – Ingold Prelog rules – R.S. notations for optical isomer with one asymmetric carbon. – Element of symmetry – Racemization – Methods of Racemization (by substitution and tautomerism) – symmetry- Resolution – Methods of resolution (Mechanical separation, seeding biochemical and conversion to diastereoisomers) – Walden inversion.

UNIT –II STEREOCHEMISTRY - II

2.1 Optical activity in compounds containing no asymmetric carbons – Biphenyls, Allenes and Spiranes.

2.2 Geometrical isomerism – Cis – Trans, Syn – Anti and E and Z notations Geometrical isomerism in Maleic and Fumaric acids in unsymmetrical ketoximes – Methods of distinguishing geometrical isomers (dipole moment, dehydration, heat of hydrogenation cyclization, melting points).

UNIT-III REACTIONS OF CARBONYL COMPOUNDS

3.1 Carbonyl polarization – Reactivity of carbonyl group – Acidity of alpha Hydrogen.

3.2 Mechanism of Perkin, Knoevenagal, Benzoin condensation. Reformatsky, and Wittig reactions.

3.3 Mechanisms of reduction (Sodium borohydride, LiAlH_4 , Wolff Kishner and MPV reductions) – Mechanisms of haloform reaction and Michael addition and Oppenauer oxidation.

3.4 Photochemistry of carbonyl compounds – Norrish I and II types.

UNIT – IV ACIDS AND ACID DERIVATIVES

4.1 Ionization of carboxylic acids – Acidity constant – comparison of acid strengths of substituted halo acids – Hammett equation.

4.2 Malonic and acetoacetic esters – Characteristics of reactive methylene group - Synthetic uses of Malonic and acetoacetic esters.

4.3 Tautomerism – Definition – Keto Enol tautomerism – identification – acid and bases catalyzed interconversion mechanism.

UNIT - V HETEROCYCLIC COMPOUNDS

5.1 Aromatic characteristics of heterocyclic compounds.

5.2 Preparation, properties and uses of Furan. Pyrole, Thiophene.

5.3 Synthesis and reactions of pyridine and Piperidine- comparative basic characters of pyrrole, pyridine and piperidine with amines.

5.4 Synthesis and reactions of Quinoline, Isoquinoline and Indole with special reference to Skraup, Bischler Napieralski and indole synthesis.

Note : Problems where possible (all units).

Books Recommended:

1. B.S.Bahl and Arun Bahl “Advanced Organic Chemistry”, S. Chand & Co, New Delhi. (1998)
2. P.L.Soni and H.M.Chwla: “Text book of Organic Chemistry: - 28th Edition (1999) – Sultan Chand , New Delhi.
3. RaviBhushan: “Stereoisomerism of carbon compounds” – CBS – Publishers, Delhi – Revised ed. (1998)
4. P.S.Kalsi: “Stereochemistry, Conformation and Mechanism” Willey Eastern Limited, New Delhi.
5. O.P.Agarwal : “Chemistry of Natural Products” Volume 1 & 2.
6. D.Nasipuri, “Stereochemistry of organic Compounds “ , Wily Eastern Ltd., New Delhi. (1992)
7. I.L.Finar, “Organic Chemistry” Volume 1, E.L.B.S., London, (1998).
8. Sheyan Egg, “Organic Chemistry Mechanisms,”
9. R.K.Bansal, “Organic Reaction Mechanism,” Tata Mc Graw Hill, 1975.
10. P.S.Kalsi, “Organic reaction and their Mechanism ,” New Age International Publishers.
11. S.H.Pine , J.B.Hendrickson, D.J.Cram and G.S Hammomd , “Organic Chemistry’ McGraw Hill fourth Edition, 1980.

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS): KARUR-05
B.Sc., CHEMISTRY - V SEMESTER – CORE COURSE - IX
 (For the candidates admitted from the year 2015-16 onwards)

PHYSICAL CHEMISTRY – I

- UNIT- I** **DEFINITION OF THERMODYNAMICS TERMS** **15 hours**
 Systems and surroundings- isolated, closed and open systems – Homogenous & heterogeneous systems, state of the system intensive and extensive variables. Thermodynamics process – cyclic processes, reversible and irreversible, isothermal and adiabatic processes – state and path functions, exact and inexact differentials, concepts of heat and work.
- UNIT –II** **FIRST LAW OF THERMODYNAMICS AND ITS APPLICATION**
 2.1 First law of thermodynamics – statements, definitions of internal energy (U), enthalpy(H), heat capacity relation between C_p and C_v - calculation of $W, Q, \partial u$ and ∂H for expansion of ideal and real gases under isothermal and adiabatic condition for reversible and irreversible processes.
 2.2 Joule – Thompson effect, Joule – Thompson experiment. Relationship between $\mu_{j,t}$ and other thermodynamic qualities. Calculation of $\mu_{j,t}$ for ideal and gases. Joule – Thompson coefficient and inversion temperature. The zeroth law of thermodynamics – statement - Requirements of thermochemical equation – bond dissociation energy – its calculation from thermochemical data. Temperature dependence of Kirchoff's equation.
- UNIT-III** **SECOND LAW OF THERMODYNAMICS AND ITS APPLICATIONS**
 3.1 Heat engine – Carnot's cycle and its efficiency – Carnot's theorem – thermodynamic scale of temperature
 CONCEPT OF ENTROPY: Entropy as a function of P, V and T. Entropy of mixing – Clausius inequality.
 3.2 GIBBS AND HELMHOLTZ FUNCTIONS:
 ΔA and ΔG criteria for thermodynamics equilibrium and spontaneity – Gibbs – Helmholtz equations and their applications – Maxwell's relations. Equilibrium constants and free energy change. Thermodynamic derivation of law of mass action.
 3.3 Equilibrium between different phases - system of variable composition – partial molar quantities – chemical potential of component in ideal mixture – Gibbs Duhem equation.
 Reaction isotherm – Van't-Hoff's equation Van't - Hoff's isochore. Clapeyron equation and Clausius Clapeyron equation – applications.
- UNIT – IV** **THIRD LAW OF THERMODYNAMICS AND ITS APPLICATIONS**
 4.1 Need for the law, Nernst heat theorem, III law of thermodynamics – statement and concept of residual entropy. Evaluation of absolute entropy from heat capacity data.
 4.2 Solutions – Ideal liquid mixtures –(benzene and toluene)-Raoult's law and Henry's law– Deviation from Raoult's law and Henry's law – Activity and activity Coefficient. Duhem-Margule's equation –its application to fractional distillation of binary miscible liquids.
 4.4 Partially miscible liquid pairs – Phenol – Water, Triethanolamine Water and Nicotine-Water systems – Lower and upper CSTs Effect of impurities on CST.
- UNIT - V** **PHASE RULE**
 5.1. Meaning of the terms – phase, component and degree of freedom. Derivation of Gibb's phase rule. Phase equilibria of one component systems-water, CO_2 and sulphur systems.
 5.2 Reduced phase rule – phase equilibria of two component of systems – solid –liquid equilibria – simple eutectic systems –Bi-Cd and Pb-Ag Systems – Pattinson's process.
 5.3 Compound formation with congruent melting points (Mg-Zn) and incongruent melting points – Efflorescence and Deliquescence.

References:

1. "Principles of physical chemistry", B.R.Puri & Sharma.
2. "Text book of Physical chemistry", P.L.Soni.
3. "Advanced Physical chemistry", GrudeeRaj.
4. "Essentials of Physical chemistry", B.S.Bahl, G.D.Tuli & Arun Bahl, S.chand & Co., N.Delhi (1999).
5. "Thermodynamics for chemistry", Samuel Glasstone.
6. "Simplified course in Physical chemistry", R.LMadan, G.D.Tuli, S.Chand & Co., N.Delhi (1999).
7. "Thermodynamics for students of chemistry", Rajaram and Kuriacose.
8. P.W.Atkins, "Physical Chemistry", ELBS, Oxford Univ. Press,1998.
9. R.A.Alberty and R.J.Silbay, "Physical Chemistry", John wiley sons. Inc. NewYork,1995.
10. Gordon. M.Barrow, "Physical Chemistry", Tata Mc Graw Hill, New Delhi.
11. I.N.Lerine, "Physical Chemistry"

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS): KARUR-05
B.Sc., CHEMISTRY - V SEMESTER - ELECTIVE COURSE - I
(For the candidates admitted from the year 2015-16 onwards)

INDUSTRIAL CHEMISTRY

- UNIT- I**
(6 hours)
- 1.1 Cement: Manufacture Wet Process and Dry Process, Types, setting of cement, Reinforced concrete.
 - 1.2 Glass: Types, Composition, manufacture of Optical glass, coloured glasses and lead glass.
- UNIT –II**
(6 hours)
- 2.1 Sugar: Cane Sugar manufacture, Recovery of sugar from molasses, Sugar estimation.
 - 2.2 Paints & Varnishes: Primary constituents of paints, dispersion medium (solvent), binder, Pigments, Oil based paints, latex paints baked on paints (alkydresins), formulation of paints and varnishes, Requirements of a good paint.
- UNIT-III**
(6 hours)
- 3.1 Chemical Explosives: Origin of explosive, preparation and chemistry of lead azide, nitrocellulose, TNT, Dynamite, Cordite and gunpowder introduction to rocket propellants.
 - 3.2 Leather Industry: Curing, Preservation and tanning of hides and skins. Treatment of tannery effluents.
- UNIT – IV**
(6 hours)
- 4.1 Petroleum: Origin, Refining, Cracking, Reforming knocking and octane number, LPG, synthetic petrol.
 - 4.2 Fuel Gases: Large scale production, Storage, Hazards and uses of coal gas, Wages gas, Producer gas, and Oil gas.
- UNIT- V**
(6 hours)
- 5.1 Electrochemical Industries: Production of materials like chlorine, caustic soda and sodium chlorate.
 - 5.2 Electrolytic refining of aluminium, Electro–Oxidation and electro-reduction process with examples, Solar cells and fuel cells.

Books Recommended:

1. B.N.Chakrabarty, Industrial Chemistry, Oxford & IBH Publishing co, New Delhi, 1981.
2. B.K.Sharma, Industrial Chemistry, Goel Publishing House, Meerut.
3. P.P.Singh, T.M.Joseph, R.G.Dhavale, College Industrial Chemistry, Himalaya Publishing House, Bombay, 4th Ed., 1983.

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS): KARUR-05
B.Sc., CHEMISTRY – V SEMESTER – SKILL BASED ELECTIVE -II
(For the candidates admitted from the year 2015-16 onwards)

SPECTROSCOPY- I

UNIT I

1.1 Definition of spectroscopy – Electromagnetic radiation, Electromagnetic spectrum, atomic and molecular spectroscopy (translational, rotational, vibrational and electronic) units.

UNIT II

2.1 UV- Visible spectroscopy- absorptions laws (Lambert's and Beer's Law)- theory of electronic transition- Absorption and intensity shifts- factors influencing \sum_{\max} and λ_{\max} - Instrumentation and applications.

UNIT III

3.1 IR- Introduction-molecular vibrations-vibrational frequency -number of fundamental vibrations- factors influencing vibrational frequencies – selection rules.

UNIT IV

4.1 IR instrumentation – finger print region- application of IR spectra (Hydro carbon, Aromatic hydro carbons, Halogen compounds, Alcohol, Aldehyde and Ketones, Amine, Amide, Acid, Esters, ϕ -NO₂ compounds)

UNIT V

5.1 Raman spectroscopy- Rayleigh and Raman effect-Scattering-Stokes and Anti Stokes lines-Difference between Raman and IR-Vibration – Rotational Spectra –mutual exclusion principle of CO₂ and N₂O.

Books Recommended:

1. G. Herzberg, "Atomic Spectra and Atomic Structure"
2. 1. William Kemp, Organic Spectroscopy, ELBS II Edition, Spectroscopy of organic compounds.
3. . P.S. Kalsi, Organic Spectroscopy, Wiley Eastern Ltd, Madras.
4. 5. C.N.Banwell, Fundamentals of molecular spectroscopy, McGraw Hill, New York,1966.
5. G. Herzberg, "Molecular Spectra and Molecular Structure I. Spectra of Diatomic Molecules"
6. G. Herzberg, "Molecular Spectra and Molecular Structure II. Infrared and Raman Spectra of Polyatomic Molecules"
7. G. Herzberg, "Molecular Spectra and Molecular Structure III. Electronic Spectra and Electronic Structure of Polyatomic Molecules"
8. G. M. Barrow, "Introduction to Molecular Spectroscopy"
9. J. G. Calvert and J. N. Pitts, Jr., "Photochemistry"
10. H. B. Dunford, "Elements of Diatomic Molecular Spectra"
11. R. N. Dixon, "Spectroscopy and Structure"
12. K.V.Raman "Spectroscopy and mathematics of Quantum Chemistry" in Print.
13. R.Chang "Basic Principles of Spectroscopy"

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U15CH5S3

GOVERNMENT ARTS COLLEGE (AUTONOMOUS): KARUR-05
B.Sc., CHEMISTRY – V SEMESTER – SKILL BASED ELECTIVE -III
(For the candidates admitted from the year 2015-16 onwards)

SPECTROSCOPY-II

UNIT I- ¹H NMR Spectroscopy

1.1. NMR Spectroscopy-principle of nuclear magnetic resonance – basic instrumentation-number of signals-chemical shift- shielding and deshielding-spin-spin coupling and coupling constants-TMS as NMR standard.

UNIT II

2.1. Interpretation of NMR spectra of simple organic compounds such as Acetone, Anisole, Benzaldehyde, Ethyl acetate, Ethylamine, Ethyl Bromide, Toluene and ethyl alcohol .

UNIT III- ESR spectroscopy

3.1.E.S.R.Spectroscopy-condition-theory of esr spectra-hyperfine splitting-esr spectra of simple radicals CH₃,CD₃,Naphthalene radical ions only.

UNIT IV - Mass spectroscopy

4.1.Mass spectroscopy-Basic principles- instrumentationmolecular ion peak, base peak, metastable peak, isotopic peak- their uses. Nitrogen rule- ring rule- fragmentation – ML rearrangement.

UNIT V

5.1. Interpretation of mass spectra of simple organic compounds such as Acetone, Anisole, Benzaldehyde, Ethyl acetate, Ethylamine, Ethyl Bromide and Toluene .

Books Recommended:

1. William Kemp, Organic Spectroscopy, ELBS II Edition, Spectroscopy of organic compounds.
2. P.S. Kalsi, Organic Spectroscopy, Wiley Eastern Ltd, Madras.
3. R.M. Silverstein, C.G. Bassler and Monsil, Spectrometric identification of organic compounds, John Wiley & Sons, New York.
4. William Kemp, NMR in Chemistry, Mac Millan, 1986.
5. A.Carrington, A.D. Melahlam, Introduction to Magnetic Resonance, Harper and Row, New York, 1967.
- 6.E.A.V.Ebsworth, David, W.H.Ranklin and Stephen Cradock, Structural methods in inorganic chemistry, Black well Scientific Publ., 1987.
7. R. Drago, Physical methods in chemistry, Reinhold, New York, 1968.
- 8.C.N.Banwell, Fundamentals of molecular spectroscopy, McGraw Hill, New York,1966.
- 9.G.W.Ewing, Instrumental methods of chemical analysis, McGraw Hill Pub, 1975.
10. Douglas. A.Skoog, Principles of instrumental analysis, Saunders College Pub.Co, III Edn., 1985
12. K.V.Raman “Spectroscopy and mathematics of Quantum Chemistry” in Print.
13. R.Chang “Basic Principles of Spectroscopy”

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

ALL UG COURSES – V SEMESTER – PART - IV

(For the candidates admitted from the year 2015 - 2016 onwards)

SOFT SKILLS DEVELOPMENT

Learning Objective

Today's world is all about relationship, communication and presenting oneself, one's ideas and the company in the most positive and impactful way. This course intends to enable students to achieve excellence in both personal and professional life.

- UNIT- I** Know Thyself/Understanding Self
Introduction to Soft Skills-Self discovery-Developing positive attitude-Improving perceptions-Forming values.
- UNIT- II** Interpersonal Skills/Understanding Others
Developing interpersonal relationship-Team building-group dynamics-Net working-Improved work relationship.
- UNIT-III** Communication Skills / Communication with others
Art of listening-Art of reading-Art of speaking-Art of writing-Art of writing e-mails-e mail etiquette.
- UNIT-IV** Corporate Skills / Working with Others
Developing body language-Practicing etiquette and mannerism-Time management-Stress management.
- UNIT-V** Selling Self / Job Hunting
Writing resume/cv-interview skills-Group discussion-Mock interview-Mock GD-Goal setting-Career planning.

Text Book:

Meena.K and V.Ayothi (2013) A Book on Development of Soft Skills (Soft Skills : A Road Map to Success), P.R.Publishers & Distributors, No, B-20 & 21, V.M.M. Complex, Chatiram Bus Stand, Thiruchirappalli - 620 002.

(Phone No:0431 - 2702824; Mobile No: 94433 70597, 98430 74472)

Alex. K (2012) Soft Skills - Know Yourself & Know the World, S.Chand & Company LTD, Ram Nagar, New Delhi - 110 055.

Mobile No: 94425 14814 (Dr.K. Alex)

Reference Books

- (i) Developing the leader within you John c Maxwell
- (ii) Good to Great by Jim Collins
- (iii) The seven habits of highly effective people Stephen Covey
- (iv) Emotional Intelligence Daniel Goleman
- (v) You can win Shive Khera
- (vi) Principle centred leadership Stephen Covey.

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS):: KARUR-05

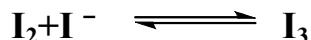
B.Sc., CHEMISTRY - VI SEMESTER – CORE COURSE – X

(For the candidates admitted from the year 2015-16 onwards)

PRACTICAL –III – PHYSICAL CHEMISTRY

Distributive Law:

- Partition coefficient of Iodine between carbon tetrachloride and water.
- Equilibrium constant of the reactions.



Kinetics:

Acid catalysed hydrolysis of an ester (Methyl acetate or Ethyl acetate)

Molecular weight:

Rast's method: Naphthalene, m-dinitrobenzene and diphenyl as solvents.

Heterogeneous equilibrium:

- Critical solution temperature of phenol – water system-effect of impurity on C.S.T (2% NaCl or 2% succinic acid solutions).
- Simple eutectic system: Naphthalene – Biphenyl, Naphthalene Diphenylamine.
- Determination of transition temperature: Sodium acetate. Sodium thiosulphate. $\text{SrCl}_2 \cdot 6\text{H}_2\text{O}$ & $\text{MnCl}_2 \cdot 4\text{H}_2\text{O}$.

Electro Chemistry:

- Conductivity : 1) Cell constant
2) Equivalent conductivity
3) Conductometric titrations
- Potentiometry: Potentiometric titrations.

Marks:

Int.Asst.	25
Practical	75

Total	100

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS):: KARUR-05

B.Sc., CHEMISTRY - VI SEMESTER – CORE COURSE – XI

(For the candidates admitted from the year 2015-16 onwards)

**PRACTICAL – IV - GRAVIMETRIC ANALYSIS AND ORGANIC
COMPOUND ANALYSIS**

1. Preparation of involving oxidation, reduction, hydrolysis, nitration, sulphonation, halogenation diazotization.
2. Characterization of organic compounds by their functional groups and confirmation by preparation of derivatives.

GRAVIMETRIC ANALYSIS

1. Estimation of calcium as calcium oxalate
2. Estimation of barium as barium sulphate
3. Estimation of barium as barium chromate
4. Estimation of lead as lead sulphate
5. Estimation of lead as lead chromate
6. Estimation of nickel as nickel dimethylglyoxime complex.

Marks:

Int.Asst.	25
Practical	75

Total	100

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS): KARUR-05

B.Sc., CHEMISTRY - VI SEMESTER – CORE COURSE - XII

(For the candidates admitted from the year 2015-16 onwards)

INORGANIC CHEMISTRY - II

UNIT-I NUCLEAR CHEMISTRY

- 1.1 Introduction – Composition of nucleus and nuclear forces.
- 1.2 Nuclear stability – n/p ratio, mass defect, binding energy, packing fraction and magic numbers, shell and drop models.
- 1.2 Isotopes – detection and separation. Isotopic constitution of elements and whole number rule. Isobars, isotones and isomers.

UNIT –II RADIOACTIVITY AND NUCLEAR TRANSFORMATIONS

- 2.1 Radioactivity – discovery, detection and measurements (Wilson cloud chamber). Disintegration theory – modes of decay – Group displacement law – Rate of disintegration – Half life and average life – Radioactive series.
- 2.2 Nuclear transformation – use of projectiles – nuclear reaction – fission and fusion. Nuclear reactors. Applications of radio isotopes – Carbon dating – Radio active waste disposal.
- 2.3 Radiolysis of water and hydrated electron

UNIT-III METALLIC STATE

- 3.1 Packing of atoms in metal (BCP, CCP, FCC, and HCP).
- 3.2 Theories of metallic bonding – electron gas, Pauling and band theories.
- 3.3 Structure of alloys – substitutional and interstitial solid solution – Hume Rothery ratios.

UNIT – IV SOME SPECIAL CLASSES OF COMPOUNDS

- 4.1 Clathrates – examples and structures. Interstitial compounds and non-stoichiometric compounds.
- 4.2 Metal alkyls, Co-ordination polymers and phosphonitrilic polymers.
- 4.3 Silicates – classification into discrete anions, one, two and three dimensional structures with typical examples composition, properties and uses of beryl, talc, mica, zeolites and ultramarines.

UNIT-V Acids and Bases

- 5.1 Lewis concept – Classification of Lewis acids - Lux Flood concept – Hard-Soft acid base concept and its applications.
- 5.2 Non- aqueous solvents- Classification of solvents- Neutralization reaction and solvolysis in liquid ammonia- Metal- ammonia solutions.
- 5.3 Neutralisation, solvolysis and redox reactions in liquid sulphur dioxide – Acid-base, precipitation and solvolysis reactions in acetic acid as solvent.

Books Recommended:

1. P.L.Soni, Mohan Katyal, “ Text book of Inorganic Chemistry”, 20th revised edn., Chand, 1992.
2. Esmarch S.Gilreath, “Fundamental concepts of Inorganic Chemistry”, International students edn. McGraw –Hill Kogakusha Ltd., 1958.
3. Gurdeep Chatwal, “Co-ordination Chemistry”, First edn., Himalaya Publishing House, 1992.
4. B.R.Puri and L.R.Sharma, “Principles of Inorganic Chemistry”, Shoban Lal Nagin Chand and Co., 1989.
5. O.P.Agarwal : “Chemistry of Natural Products” Volume 1 & 2.
6. R.D.Madan, “Modern Inorganic Chemistry”.
7. S.Glasstone, “Source Book on Atomic Energy”, 3rd edn., Affiliated East West Press, 1967.

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS): KARUR-05
B.Sc., CHEMISTRY - VI SEMESTER – CORE COURSE - XIII
(For the candidates admitted from the year 2015-16 onwards)

ORGANIC CHEMISTRY – II

- UNIT- I PHENOLS, NITRO COMPOUNDS AND AMINES**
- 1.1 Cresols di and trihydric phenols, α and β naphthols – Preparation and Properties.
 - 1.2 Conversion of nitrobenzene to ortho, para, and Meta dinitrobenzene.
 - 1.3 Relative basic characters of Aliphatic and Aromatic amines.
 - 1.3 Diazomethane and diazoacetic ester- preparation, structure and their synthetic uses.
 - 1.4 Sulphanalic acid, Sulphanilamide, Saccharin, Chloramine – T- Preparation and uses.
- UNIT –II AMINO ACIDS AND PROTEINS**
- 2.1 Classification of amino acids. Essential and non- essential amino acids.
 - 2.2 Preparation of L- Amino acids properties and reactions. Zwitter ions isoelectric points, peptide synthesis, structure determination of poly peptides. End group analysis.
 - 2.3 Proteins – classification based on physical and chemical properties and based on physiological function primary and secondary structures of proteins. Helical and sheet structures (elementary treatment only) denaturation of proteins.
 - 2.4 Type of nucleic acids – DNA and RNA biological functions only.
- UNIT-III CARBOHYDRATES**
- 3.1 Mutarotation and its mechanism, cyclic structure, pyranose and furanose forms of glucose and fructose. Epimerization, chain lengthening and chain shortening of aldoses. Inter conversion of aldoses and ketoses. Haworth, Fisher and chair conformations of glucose.
 - 3.2 Di and polysaccharides – reaction and structure of maltose, lactose, Sucrose, starch and cellulose.
- UNIT – IV NATURAL PRODUCTS**
- 4.1 Structural elucidations of menthol and α Terpinol.
 - 4.2 Alkaloids – general methods of isolation and structural determination of piperine and nicotine.
 - 4.3 Vitamins – thiamine, riboflavin, pyridoxine and ascorbic acids occurrence and biological importance only.
- UNIT- V MOLECULAR REARRANGEMENT**
- 5.1 Pinacol – pinacolone rearrangement – Beckmann, Benzidine, Hoffmann, Curtius, benzylic acid rearrangement. Claisen (sigmatropic rearrangement) and para Claisen rearrangements. Cope and Oxycope rearrangements, Fries rearrangement. (Mechanism only).

Books Recommended:

1. P.L.Soni, and H.M.Chawala, “Text Book of Organic Chemistry”, 27th edn. Sultan Chand 1997.
2. V.S.Parmar and H.M.Chawala, “Principles of Reaction Mechanism in Organic Chemistry o”, 2nd Edn., Sultan Chand 1978.
3. Subash Chandra Rastogi, Satis kumar Agarwala Ashok Sharma, “Chemistry of Natural Products” Vol.I & Vol.II Edition !974-75. Jai Prakash Nath & Co. Leading Educational Publishers.
4. Ernest L.Eliel “Stereochemistry of Carbon Chemistry”, 19th Reprint 1995 Tata McGraw Hill Publishing company Ltd.
5. M.K.Jain “Organic Chemistry”, 12th Edn., Shoban Lal Nagin Chand and Co.

Sl. No.:

Subject Code:

U15CH6E2

GOVERNMENT ARTS COLLEGE (AUTONOMOUS): KARUR-05

B.Sc., CHEMISTRY - VI SEMESTER – ELECTIVE COURSE - II

(For the candidates admitted from the year 2015-16 onwards)

ANALYTICAL CHEMISTRY

- UNIT- I** 1.1 DATA ANALYSIS
Errors in chemical analysis, Classification of errors, Determine errors, Instrumental errors, Personal errors, constant errors and proportional errors – Correction of determinate errors Random errors, Precision, Accuracy and rejection of data questioned. Significant figures, Mean deviation and standard deviation. Curve fitting. Method of least squares.
- 1.2 ORGANIC ESTIMATIONS
Principles and methods to estimate glucose, ascorbic acid, Phenol. Aniline- Iodine value, Saponification value R.M.value and Acetyl value.
- UNIT –II** CHROMATOGRAPHY
2.1 Principles involved in adsorption, Partition and ion exchange, paper, Thin Layer, Column, Gas Liquid chromatography. Electro-phoresis- Applications.
2.2 Desiccants, Vacuum drying, Distillation, fractional Distillation, Stem Distillation, Azeotropic Distillation, Crystallisation and Sublimation – Principles and Techniques.
- UNIT-III** THERMOANALYTICAL METHODS
3.1 Principles involved in thermo gravimetric analysis and differential thermal analysis – instrumentation.
Characteristics of TGA (CaC_2O_4 , H_2O , $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ and DTA curves – (CaC_2O_4 , H_2O) factors affecting TGA and DTA curves.
3.2 Thermometric Titration of HCl Vs NaOH.
3.3 ANALYTICAL ELECTROCHEMISTRY
Electrolytic Separation. Principles of electrodeposition. Electro- Gravimetry (Estimation of Copper and Silver).
- UNIT – IV** COLORIMETRIC ANALYSIS
4.1 Laws of Colorimetry – Nessler’s and Photo electric colorimetric method – operation and applications. Estimation of Ni, Cu and Fe.
4.2 Basic principles of flame photometry – Atomic absorption – Spectrophotometry- Estimation of Na, K and Ca.
4.3 TECHNIQUES IN KINETICS
Principles and techniques used to follow the kinetics of ordinary and fast Photo chemical reactions.
- UNIT - V** ELECTRO ANALYTICAL METHOD
5.1 Polarography- principle, concentration polarization, dropping mercury electrode (DME) –advantages and disadvantages-migration, residual, limiting and diffusion current- use of supporting electrolytes- Illkovic equation (derivation not required) significance- Half wave potential ($E_{1/2}$) – polarography an analytical tool in qualitative and quantitative analysis.
5.2 Polarimeter – principle - specific rotation – instrumentation- applications.

Books Recommended:

01. R.Gopalan, P.S. Subramaniam and K.R. Rengarajan: “Elements of Analytical Chemistry”, “sultan chand & Sons, New Delhi (1995).
02. B.K.Sharma: Instrumental Methods of Chemical Analysis, Goel Publishing House, Meerut(1999)
03. S.M.Khopkar: Basic Concepts of Analytical Chemistry, New Age International(P) Limited, New Delhi(1998)
04. Gurdeep Chatwal, Sham Anand: Instrumental Methods of Chemical Analysis, Himalaya Publishing House, Mumbai(1998)
05. R.A.Day and A.L.Underwood. :Quantitative Analysis”, Prentice Hall of India, New Delhi(1998)
06. D.A.Skoog & D.M. West: Fundamentals of Analytical Chemistry W.B.Saunders, New York (1982)
07. K.V. Raman: Computers in Chemistry Tata MC Graw Hill Co., New Delhi(1993)
08. B.G.Gottfried: BASIC Programming Mc Graw Hill International Ltd., (1980)
09. B.R.Gottfried: C Language Programming Mc Graw Hill International Ltd., (1987)
10. E.Balagurusamy: C Language Tata MC Graw Hill Co., New Delhi(1997)
11. A.I.Vogel, Text Book of Quantitative Inorganic Analysis Longman (1984).

Sl. No.:

Subject Code:

U15CH6E3

**GOVERNMENT ARTS COLLEGE (AUTONOMOUS): KARUR- 05
B.Sc., CHEMISTRY - VI SEMESTER – ELECTIVE COURSE - III**

(For the candidates admitted from the year 2015-16 onwards)

PHYSICAL CHEMISTRY – II

UNIT-I ELECTRICAL CONDUCTANCE

- 1.1 Elementary treatment of Debye- Huckel Onsager equation for strong electrolytes. Evidence for ionic atmosphere. The conductance at high field (Wein effect) and high frequencies (Debye – Falkenhagen effect). Transport number and Hittorf's rule – determination by Hittorf's method and moving boundary method
- 1.2 Determination of K_a of acids. Determination of solubility product of a sparingly soluble salt. Conductometric titrations.

UNIT – II

- 2.1 Electromotive force of a cell and its measurements. Applications of Gibbs Helmholtz equation, concentration and E.M.F. Nernst equation.
- 2.2 Types of reversible electrodes – Gas/metal ion, metal/metal ion, metal/insoluble salt/anion and Redox electrodes. Electro reactions. Standard hydrogen electrode – reference electrodes – standard electrode potentials – Sign conventions – Electrochemicals series and its significance.
- 2.3 Concentration cells with and without transport. Liquid junction potential. Application of concentration cells – Valency of ions, solubility product and activity co-efficient, potentiometric titrations. Determination of pH using hydrogen, quinhydrone and glass electrodes.

UNIT– III

- 3.1 Derivation of rate constant of a second order reaction-when the reactants are taken at different initial concentrations-when the reactants are taken at the same initial concentrations-Determination of the rate constant of a II order reaction-Derivation of rate constant of a third order reaction-when the reactants are taken at the same initial concentrations. Derivation of half-life periods for second and third order reactions having equal initial concentration of reactants
- 3.2 Effect of temperature on reaction rates-Derivation of Arrhenius equation-concept of activation energy-determination of Arrhenius frequency factor and energy of activation

UNIT -IV

- 4.1. Collision theory of reaction rates-Derivation of rate constant of a bimolecular reaction from collision theory-Failures of CT
- 4.2. Lindemann theory of Unimolecular reactions.
- 4.3. Theory of Absolute Reaction Rates-Thermodynamic derivation of rate constant for a bimolecular reaction based on ARRT-comparison between ARRT and CT. Significance of free energy of activation and entropy of activation.
- 4.4. Kinetics of complex reactions of first order opposing, consecutive and parallel reactions-examples.

UNIT – V

5. Photochemistry
- 5.1. Consequences of light absorption-The Jablonski diagram non radiative transitions-radiative transitions-Grotthus-Draper law- The Stark Einstein law of photochemical equivalence-Quantum efficiency (quantum yield).
- 5.2. Energy transfer in photochemical reactions photosensitisation- Photosynthesis in plants-Chemiluminescence - fluorescence and phosphorescence-lasers-uses of lasers.
- 5.3. Photochemical reactions-Kinetics of hydrogen-bromine reaction-decomposition of HI – Photolysis of aldehydes and ketones(Mechanism only)

Books Recommended:

1. “Principles of physical chemistry“, B.R.Puri & Sharma.
2. R.P.Varma & Pradeep . “Physical Chemistry”
3. Dr. S.Jain & S.P.Jakkar, “Physical Chemistry, principles & problems” , Tata McGraw Hill, New Delhi, 1990.
4. Glasstone S., Lewis D.,Elements of Physical Chemistry, London, Mac Millan & Co. Ltd.
5. Atkins P.W., Physical Chemistry, (5th edition) Oxford University Press (1994)

Sl. No.:

Subject Code:

U15EA4

அரசு கலைக் கல்லூரி (தன்னாட்சி), ஈரூர் - 639005
அனைத்து இளநிலை - ஆறாம் பருவம் - பகுதி - 5
(2015 - 2016 கல்வியாண்டு முதல் பயிலும் மாணவர்களுக்கு உரியது)

பாலின சமத்துவம்

அலகு 1

பாலினம்தொடர்பான கோட்பாடுகள் : பாலியல் - பாலினம் - உடற்கூறு ரீதியில் நிருணயித்தல் - ஆணாதிக்கம் - பெண்ணியம் - பாலின பாகுபாடு - பாலின வேலைப் பாகுபாடு - பாலின ஒருபடித்தானவர்கள் - பாலின உணர்வூட்டல் - பாலின சமவாய்ப்பு - பாலின சமத்துவம் - பாலின மையநீரோட்டமாக்கல் - அதிகாரப்படுத்துதல்.

அலகு 2

மகளிரியல் : பாலினசமத்துவக்கல்வி - பல்கலைக்கழக மானியக்குழுவின் வழிகாட்டுதல்கள் - ஏழாவது ஐந்தாண்டு திட்டம் முதல் பதினோராவது ஐந்தாண்டுத்திட்டம் வரை - பெய்ஜிங் மாநாடு - பெண்களுக்கு எதிரான அனைத்தவகையான பாகுபாடுகளையும் நீக்கும் ஒப்பந்தம் - 1979 (CEDAW) - சட்டத்தில் பெண்களுக்கு ஆதரவானவற்றை இணைத்தல் அல்லது உட்படுத்துதல் - பெண்களுக்கு எதிரானவற்றை ஒதுக்குதல்.

அலகு 3

பாலியல் பாகுபாட்டிற்கான தளங்கள் : குடும்பம் - பாலின விகிதாச்சாரம் - கல்வி - ஆரோக்கியம் - ஆளுமை - மதம் - வேலைவாய்ப்பு - ஊடகங்கள் - அரசியல் - சட்டம் - பாலியல் துன்புறுத்தல்கள்.

அலகு 4

பெண்கள் மேம்பாடு மற்றும் பாலின சமத்துவ மேம்பாடு : பெண்களுக்கான சமத்துவ முயற்சிகள் - சர்வதேச பெண்களுக்கான சகாப்தம் - சர்வதேச பெண்களுக்கான ஆண்டு - பெண்களின் மேம்பாட்டிற்கான தேசியக் கொள்கைகள் - பெண்கள் அதிகார ஆண்டு 2001 - சர்வதேசக் கொள்கைகளை மையநீரோட்டமாக்கல்.

அலகு 5

பெண்கள் இயக்கங்கள் மற்றும் பாதுகாப்பு நிறுவன ஏற்பாடுகள் : தேசிய மகளிர் ஆணையம் - மாநில மகளிர் ஆணையம் - அனைத்து மகளிர் காவல் நிலையங்கள் - குடும்ப நீதிமன்றங்கள் - குடும்ப வன்முறையிலிருந்து பெண்களைப் பாதுகாக்கும் சட்டம் 2005 - பணியிடங்களில் பெண்கள் மீதான பாலியல் துன்புறுத்தல்களைத் தடுப்பதற்கான உச்சநீதிமன்ற வழிகாட்டுதல்கள் - விசாகா தீர்ப்பு - தாய் சேய் சேம நலச்சட்டம் - பெண் சிசுவை கருவில் கண்டறிவதைத் தடை செய்யும் சட்டம் 1994 - ஈவ்டிசிங் - பெண்களைத் தொல்லை செய்தல் தடுப்புச் சட்டம் - மகளிர் சுயஉதவிக்குழுக்கள் - பஞ்சாயத்து அமைப்புகளுக்கான 73வது மற்றும் 74வது சட்டத்திருத்தம்.

Text Book:

1. பாலின சமத்துவம் - முனைவர். ஆ. ஜெகதீசன் - ராஜா பதிப்பகம், திருச்சி.