





KADI SARVA VISHWAVIDYALAYA
B.Sc Semester III Syllabus (W.E.F. June 2018)

	KADI SARVA VISHWAVIDYALAYA					
	B.SC CHEMISTRY SEMESTER - 3 SCHEME					
Subject Code	Course	Instructions Hrs / week	Examination			Credit
			Internal	University Exam	Total	
CCH-301	Organic Chemistry - I	3	30	70	100	3
CCH-302	Physical Chemistry - I	3	30	70	100	3
CPH-301	Basic Physics - I	3	30	70	100	3
CPH-302	Basic Physics - II	3	30	70	100	3
FCG-301	(University Elective) Basic English – III	2	15	35	50	2
EGC-301	(Generic Elective - Institute elective) Social Service Scheme - 1	2	50	00	50	2
SE CH 301-A	(Discipline Specific Specialization) Introductions Dyes Intermediate	2	50	00	50	2
SE CH 301-B	(Discipline Specific Specialization) Introduction to Polymer Chemistry					
SE CH 301-C	(Discipline Specific Specialization) Medicinal Chemistry-I					
PCH-301	Chemistry Practical - III	6	0	100	100	3
PPH-301	Physics Practical - III	6	0	100	100	3
Total		30	235	515	750	24




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	KADI SARVA VISHWAVIDYALYA					
	B.SC MICROBIOLOGY SEMESTER - 3 SCHEME					
Subject Code	Course	Instructions Hrs / week	Examination			Credit
			Internal	University Exam	Total	
CMB-301	Microbial Biochemistry	3	30	70	100	3
CMB-302	Immunology	3	30	70	100	3
CCH-301	Organic Chemistry - I	3	30	70	100	3
CCH-302	Physical Chemistry - I	3	30	70	100	3
FCG-301	(University Elective) Basic English – III	2	15	35	50	2
EGC-301	(Generic Elective - Institute elective) Social Service Scheme - 1	2	50	00	50	2
SE MB 301-A	(Discipline Specific Specialization) Food Microbiology I	2	50	00	50	2
SE MB 301-B	(Discipline Specific Specialization) Pathology –I					
PCH-301	Chemistry Practical - III	6	0	100	100	3
PMB-301	Microbiology Practical - III	6	0	100	100	3
Total		30	235	515	750	24




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	KADI SARVA VISHWAVIDYALAYA					
	B.SC MATHEMATICS SEMESTER - 3 SCHEME					
Subject Code	Course	Instructions Hrs / week	Examination			Credit
			Internal	University Exam	Total	
CMAT-301	Calculus and Linear Algebra	3	30	70	100	3
CMAT-302	Numerical Analysis	3	30	70	100	3
CPH-301	Basic Physics - I	3	30	70	100	3
CPH-302	Basic Physics - II	3	30	70	100	3
FCG-301	(University Elective) Basic English – III	2	15	35	50	2
EGC-301	(Generic Elective - Institute elective) Social Service Scheme - 1	2	50	00	50	2
SE Math 301-A	(Discipline Specific Specialization) Business Mathematics - 1	2	50	00	50	2
SE Math 301-B	(Discipline Specific Specialization) Discrete Mathematics - 1					
PPH-301	Physics Practical - III	6	0	100	100	3
PMAT-301	Mathematics Practical - I	6	0	100	100	3
Total		30	235	515	750	24



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	KADI SARVA VISHWAVIDYALYA					
	B.SC PHYSICS SEMESTER - 3 SCHEME					
Subject Code	Course	Instructions Hrs / week	Examination			Credit
			Internal	University Exam	Total	
CPH-301	Basic Physics - I	3	30	70	100	3
CPH-302	Basic Physics - II	3	30	70	100	3
CMAT-301	Calculus and Linear Algebra	3	30	70	100	3
CMAT-302	Numerical Analysis	3	30	70	100	3
FCG-301	(University Elective) Basic English – III	2	15	35	50	2
EGC-301	(Generic Elective - Institute elective) Social Service Scheme - 1	2	50	00	50	2
SE CH 301-A	(Discipline Specific Specialization) Engineering Physics-1	2	50	00	50	2
SE CH 301-B	(Discipline Specific Specialization) Applied Physics-1					
PPH-301	Physics Practical - III	6	0	100	100	3
PMAT-301	Mathematics Practical - I	6	0	100	100	3
Total		30	235	515	750	24



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CCH-301 ORGANIC CHEMISTRY - I

RATIONALE: This course is designed to enable students to acquire basic understanding of organic chemistry. Its origin and structure helps the potential application of the unexplored and unidentified chemicals in the industry.

LEARNING OUTCOMES:

- Understand the concept of organic and physical chemistry
- Develop an understanding of different electrophilic aromatic substitution reactions
- Gain knowledge about the structure, function and applications heterocyclic compounds

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

Subject Code	Subject Title	Credits	Theory			Total Marks
			Hrs.	Max Marks		
				Mid Term	End Term	
CCH-301	Organic Chemistry - I	3	48	30	70	100

COURSE CONTENT:

Unit 1: Acid-Base Properties	No of lectures: 16 Weightage :33.4%
<ul style="list-style-type: none">❖ Proton Acids-Bases theory, Lewis Acids-Bases theory❖ Scale of acidity-basicity, Factors effecting acidity and basicity of organic compounds❖ Resonance effect (Drawing resonance structures and the conditions for resonance)❖ Inductive and electronic effects❖ Effect of hybridization, Steric effects❖ Effects by hydrogen bonding	
(B)Carbohydrates	
<ul style="list-style-type: none">❖ Introduction❖ Definition & classification of Mono Saccharides.❖ Nomenclature.❖ Reactions of Glucose and Fructose (Methylation, Acetylation, Oxidation with Br₂ water ,Conc.HNO₃ , Fehling solution and Tollens reagent. Reaction with HCN, NH₂OH, Osazone formation and Epimerization.)❖ Lengthening & shortening of carbon chain of aldoses	
Unit 2:Electrophilic Aromatic Substitution	No of lectures: 16 Weightage :33.3%
<ul style="list-style-type: none">❖ Introduction❖ Effect of substituent groups❖ Determination of orientation and relative reactivity❖ Classification of substituent groups❖ Orientation and synthesis❖ Mechanism of nitration, sulfonation, Friedel-Craft alkylation and halogenations	



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- ❖ Orientation in mono and disubstituted benzenes
- ❖ Electrophilic aromatic substitution (Two steps)
- ❖ Theory of reactivity.
- ❖ Theory of orientation.
- ❖ Electron release via resonance

Unit 3: Heterocyclic Compound

No of lectures: 16 Weightage :33.3%

- ❖ Introduction.
- ❖ Nomenclature.
- ❖ Molecular orbital picture and aromatic characteristics of Pyrrole, Furan, Thiophene and Pyridine.
- ❖ Methods of synthesis for Pyrrole, Furan, Thiophene and Pyridine.
- ❖ Chemical reactions for Pyrrole, Furan and Thiophene.
- ❖ Electrophilic substitution reactions of for Pyrrole, Furan and Thiophene with mechanism.
- ❖ Electrophilic and Nucleophilic substitution reactions of pyridine with mechanism.
- ❖ Basicity of Pyridine, Piperidine and pyrrole

REFERENCE BOOKS

1. Organic Chemistry by Morrison and Boyd. 4th ed. Pearson Education 2003
2. Advance Organic Chemistry by Jerry March.
3. Advance Organic Chemistry by ArunBahal and B.S.Bahal.
4. Organic Chemistry Vol. I & II by S.M.Mukherji, S.P.SingR.P.Kapoor.
5. Text book of Organic Chemistry by ArunBahal, B.S.Bhal, S.Chand.
6. Organic Chemistry by I.L.Finar.
7. Organic Chemistry by pine, Hendrickson, Cram and Hammond 4th ed By P.S.Kalsi.

INSTRUCTION STRATEGIES

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

TEACHING AND EXAMINATION

UNIT	Examination Scheme %Weightage	Teaching Scheme No. of Lecture
Unit 1	33.4	16
Unit 2	33.3	16
Unit 3	33.3	16
Total	100	48



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CCH-302 PHYSICAL CHEMISTRY - I

RATIONALE: This course is designed to enable students to acquire basic understanding of physical chemistry

LEARNING OUTCOMES:

- Understand the concept of colligative properties and partial molar properties.
- Develop an understanding of electrochemistry and various electrodes.
- Gain knowledge about properties of liquids like viscosity, surface tension, refractive index etc.

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

Subject Code	Subject Title	Credits	Theory			Total Marks
			Hrs.	Max Marks		
				Mid Term	End Term	
CCH-302	Physical Chemistry - I	3	48	30	70	100

COURSE CONTENT:

Unit 1: Physical Properties of liquid No of lectures: 16 Weightage:33.4% <ul style="list-style-type: none">❖ Vapor-Pressure❖ Surface tension❖ Measurement of surface tension by stalagmometer❖ Parachor and its applications❖ Viscosity❖ Measurement of viscosity by Ostwald-viscometer❖ Refractive index❖ Specific refraction❖ Molar refraction❖ Measurement of Refractive index by Abbe's Refractometer❖ Optical activity❖ Measurement of Optical activity by Polarimeter❖ Dipole moment and its measurements & its application❖ Numerical
Unit 2: Thermodynamics No of lectures: 16 Weightage:33.3% <p>(A) Thermodynamics and colligative properties.</p> <ul style="list-style-type: none">❖ Clapeyron-clausius equation, Integrated form of clapeyron-clausius equation❖ Application of clapeyron-clausius equation from various phases in equilibrium❖ Elevation in Boiling point (K_b)❖ Depression of freezing point (K_f)❖ Relative lowering in vapour pressure❖ Osmotic pressure



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(B) Partial molar Properties

- ❖ Partial molar free energy.
- ❖ Concept of Chemical Potential.
- ❖ Gibb's-Duhem equation.
- ❖ Variation of chemical potential with temperature and pressure.
- ❖ Duhem-Margules equation.
- ❖ Numericals

Unit 3: Electrochemistry

No of lectures: 16 Weightage:33.3%

- ❖ Introduction of terms: Oxidation, Reduction, Redox, Anode, Cathode, Electrode, Half Cell, Oxidation & Reduction Potential.
- ❖ Electrochemical cell (Galvanic Cell) & Representation cell.
- ❖ Electrochemical Series and its Significance
- ❖ Nernst Equation of Cell EMF and single electrode potential.
- ❖ Description of the following electrode:
 - 1) Metal-Metal ion Electrode.
 - 2) Standard Hydrogen Electrode.
 - 3) Calomel Electrode.
 - 4) Weston standard Electrode.
 - 5) Glass Electrode.
 - 6) Quinhydrone Electrode

REFERENCE BOOKS

1. Advance Physical Chemistry by Gurdeep Raj
2. Physical Chemistry (Question and Answers) by R.N.MadanG.D.Tully, S.Chand.
3. Principles of Physical Chemistry by Puri, Sharma, Pathania.
4. Essentials of Physical Chemistry by B.S.Bahal, ArunBahalG.D.Tully.
5. Chemical Thermodynamics by R.P.Rastogy and R.R.Misra.
6. Physical Chemistry by P.W.Atkins, 5th ed. , Oxford, 1994, 7th ed. ,2002
7. Physical Chemistry by R.A.Alberty and R.J.Silbey, John Wiley, 1995.
8. Physical Chemistry by G.H.Barrow, 5th ed. , Mac Graw Hill, 1998, 6th ed.
9. Physical Chemistry by W.J.Moore, 4th ed. , Orient Longmans, 1969.

INSTRUCTION STRATEGIES

1. Interactions with the students to understand the level of students
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TEACHING AND EXAMINATION

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Unit 1	33.4	16
Unit 2	33.3	16
Unit 3	33.3	16
Total	100	48



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SUBJECTIVE SPECIALIZATION PAPERS (Chemistry Course)

- Program will be offered as a part of sequential elective paper from semester-III to VI.
- Total three separate specialization are offered to B.Sc. chemistry students.
 - (1) Synthetic Dyes
 - (2) Polymers
 - (3) Medicinal Chemistry
- Students have to opt any one subject out of these three subjects from semester-III.
- The same sequence of elective will be continued up to semester-VI.
- For each elective program for separate semester wise modules (courses) have been designed as follows.....

Mid Term Examination Scheme (Only Internal Evaluation) : Total Marks - 40

Internal Theory: 20 Marks (One internal exam of 40 marks is to be conducted : $40/2=20$ Marks)

Internal Practical: 30 Marks (Internal Practical Exam of 20 marks is to be conducted + 10 marks of assignment / Journal / Report)

For more transparency for the practical exam, 1 internal examiner from base institute and another examiner will be from other KSV institute.

Internal Theory Examination Structure

Q : 1	Answer all questions each question carry 1 (one) mark. (Either from Theory / Practical) <ul style="list-style-type: none">• Short Questions• Multiple Choice Questions• Fill in the Blanks• True / False• Definition• Expand	10 Marks
Q : 2	Attempt Any 6 out of 8 (Short Note or Descriptive Questions)	30 Marks
	Total	40 Marks



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Synthetic Dyes
SE CH 301A Introductions Dyes Intermediate

RATIONALE: This course is designed to enable students to acquire basic understanding of the synthetic dyes, its origin and structure to help the potential application of the explored dyes in the industry.

LEARNING OUTCOMES:

- Understand the concept of origin of synthetic dyes and its intermediates.
- Develop an understanding the synthesis of dyes.
- Gain knowledge about the structure, function and applications of various synthetic dyes and its intermediates.

Subject Code	Subject Title	Credits	Theory/Practical				Total Marks
			Hrs.	Max Marks			
				Mid Term Theory	Mid Term Practical	End Term	
SE CH - 301-A	Introduction to Dyes Intermediate	2 (1 hr Theory + 2 hr Practical)	36	20	30	--	50

COURSE CONTENT

THEORY Introduction of Synthetic Dyes Number of lectures: 12 Weightage: 50%

- Introduction of Dyes Intermediate
- Color and Chemical Constitution
- Chemistry of Dyestuff
- Classification of Dyes
- Applications of dyes
- Name and structure of (i) Benzene (ii) naphthalene (iii) *anthraquinone*
- Synthesis of (i) H-acid (ii) 4-amino -2-methoxy toluene (iii) 1;2, diamino anthraquinone (iv) G-Acid (V) R-Acid

PRACTICALS

Number of hours: 24

Preparation of Different Dyes Intermediate : (Out of Any Six)

- Preparation of H-acid
- Preparation of 4-amino -2-methoxy toluene
- Preparation of G-Acid
- Preparation of R-acid
- Preparation of Preparation of Chicago Acid
- Preparation of Shaffer Acid
- Preparation of Anthraquinone
- Preparation of Quinazarin
- Preparation of Bromamine acid
- Preparation of 1-Amino and 2-amino Anthraquinone



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REFERENCES:

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

TEACHING AND EXAMINATION

UNIT	Examination Scheme %Weightage	Teaching Scheme No. of Lecture
Unit 1	40	12
Unit 2	60	24
Total	100	36



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POLYMER

SE CH 301 B Introduction to Polymer Chemistry

Subject Code	Subject Title	Credits	Theory/Practical				Total Marks
			Hrs.	Max Marks			
				Mid Term Theory	Mid Term Practical	End Term	
SE CH - 301-B	Introduction to Polymer Chemistry	2 (1 hr Theory + 2 hr Practical)	36	20	30	--	50

RATIONALE: This course is designed to enable students to acquire basic understanding of the polymers, its origin and structure to help the potential application of the unexplored polymers in the industry.

LEARNING OUTCOMES:

- Understand the concept of origin of polymers and its intermediates.
- Develop an understanding the polymers.
- Gain knowledge about the structure, function and applications of various polymer preparations.

COURSE CONTENT

Number of lectures: 12

Weightage: 50%

THEORY:

- Polymers – Homo polymers, copolymers, branched and cross-linked polymers, graft and block copolymers, rubbers, plastics, thermoplastics, thermosetting plastics, fibres (characteristic features of each).
- Natural and synthetic polymers – basic concept of monomers, functionality, molecular weight, degree of polymerization.
- Physical properties and applications of various types of plastics and rubbers: plastics – polyethylene, Polyvinylchloride, polypropylene, nylons, polymethyl methacrylate, polyethylene terephthalate, Teflon, polystyrene, polycarbonates; Rubbers: natural rubber, styrene-butadiene rubber, polybutadiene, polyisobutylene, butyl rubber, nitrile rubber, neoprene rubber.

PRACTICALS:

Number of hours: 24

Synthesis of Homo polymers

- Polystyrene
- Poly acrylonitrile
- PMMA

Synthesis of copolymers

- Styrene-PAN
- Styrene-PMMA
- PMMA-PAN



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REFERENCES:

1.	F.W. Billmeyer, A text book of polymer science, John Wiley & Sons, 1971.
2.	V.R. Gowariker, N.V. Viswanathan and Sreedhar, Polymer Science, Wiley Eastern Ltd., New Delhi, 1986.
3.	Maurice Morten, Rubber Technology, Van Nostrand, Reinold, New York.
4.	S. Paul, Surface Coatings
5.	B.K. Sharma, Polymer Chemistry, Goel Publishing House, Meerut
6.	M. Jenkins, Biomedical Polymers, University Birmingham, U.K.
7.	Polymer Science and Technology: Plastics, Rubbers, Blends and Composites By Premamoy Ghosh

TEACHING AND EXAMINATION

UNIT	Examination Scheme %Weightage	Teaching Scheme No. of Lecture
Unit 1	40	12
Unit 2	60	24
Total	100	36



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Medicinal Chemistry

SE CH 301 C Medicinal Chemistry-I

Subject Code	Subject Title	Credits	Theory/Practical				Total Marks
			Hrs.	Max Marks			
				Mid Term Theory	Mid Term Practical	End Term	
SE CH - 301-C	Medicinal Chemistry - 1	2 (1 hr Theory + 2 hr Practical)	36	20	30	--	50

COURSE CONTENT

Number of lectures: 12

Weightage: 50%

THEORY

- **Introduction to Medicinal Chemistry**

Terms used in medicinal chemistry like Drugs, metabolism, agonists, antagonists, chemotherapeutic agents, Chemotherapeutic Index, SAR and QSAR, different types of drugs like antipyretics, analgesics, anti-inflammatory, anti-malarial, antibiotics, Sulpha drugs etc

- Chemical classification of drugs, Chemical nomenclature

PRACTICALS

Number of hours: 24

Organic spotting of an organic substance having single and bi-functionality

- | | |
|--------------------|-----------------|
| ➤ Salicylic acid | ➤ Hippuric acid |
| ➤ Anthranilic acid | ➤ Phthalic acid |
| ➤ Sulphanilic acid | ➤ Resorcinol |
| ➤ Acetanilide | ➤ Aniline |

REFERENCES:

1. Wilson and Giswold's Textbook of Organic, Medicinal and Pharmaceutical Chemistry, J. N. Delgado and W. A. R. Remers, Eds, J. Lipponcott Co. Philadelphia.
2. Principles of Medicinal Chemistry by W. C. Foye,, Lea &Febiger, Philadelphia.
3. Burger's Medicinal Chemistry, H. E. Wolff, Ed. John Wiley & Sons, New York Oxford University Press, Oxford.
4. Singh and Kapoor "A Text Book of Pharmaceutical and Medicinal Chemistry" VallabhPrakashan, New Delhi.
5. A textbook of practical organic chemistry by A.I.Vogel
6. Comprehensive practical organic chemistry: preparation and qualitative analysis by V.K. Ahluwalia, R. Aggrwal



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TEACHING AND EXAMINATION

UNIT	Examination Scheme %Weightage	Teaching Scheme No. of Lecture
Unit 1	40	12
Unit 2	60	24
Total	100	36



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CMB 301- Microbial Biochemistry

RATIONALE: This course is designed to enable students to acquire basic understanding of the Microbial biochemistry and the uses of biomolecules in the cell structure, function, organization and its mechanism in development of the cell.

LEARNING OUTCOMES:

- Understand the concept of Biomolecules and Microbial chemistry.
- Develop an understanding of the Chemistry of microbial constituents and awareness of the microbes.
- Gain knowledge about the structure, function and applications of the bacterial cell molecules and its development.

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

Subject Code	Subject Title	Teaching Scheme	Credits	Examination Scheme			Total Marks
		Theory Per Week		Hrs.	Max Marks		
					Mid Term	End Term	
CMB- 301	Microbial Biochemistry	3	3	48	30	70	100

COURSE CONTENT

<p>Unit I: Bioenergetics</p> <ul style="list-style-type: none">• Structure and Properties of Water (2hr)• Buffer solution ,Biological Buffers(2hr)• pH, PKa and Amino acid titration curve(2hr)• Principles of bioenergetics and high energy phosphate compounds. (3hr)• Generation of ATP & reducing power in chemoautotrophs (forward and reverse etc). (3hr)	<p>Number of lectures: 12 Weightage: 25%</p>
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Number of lectures: 12

Weightage: 25%

Unit II : Carbohydrates , lipids and Vitamins

- Chemical structures, nature and properties of carbohydrates and its classification(3hr)
- Saturated and unsaturated fatty acids. (2hr)
- Structure, classification, properties and function of lipids(2hr)
- Distribution and functions of lipids in microorganisms. (2hr)
- Vitamins and its biological importance. (3hr)

Number of lectures: 12

Weightage: 25%

Unit III: Amino acids, Proteins and Nucleic acids

- Amino acids- Classification and properties. Structure, Zwitterions nature. (3hr)
- Proteins- Classification, Structure and function. Primary, secondary, tertiary and quaternary structure. (3hr)
- Classification ,structures and importance of Nucleic acids. (2hr)
- DNA ,RNA structures and types(2hr)
- Hormones: Steroid hormones, Structure and function. (2hr)

Number of lectures: 12

Weightage: 25%

Unit-IV Introduction to metabolism:

- An overview of metabolism, Anabolism, Catabolism, Primary and Secondary metabolism(2hr)
- Role of reducing power, precursor metabolites and energy rich compounds in cell metabolism. (2hr)
- Respiratory and fermentative metabolism: Basic concept of respiration, types of respiration, Basic concept of fermentative metabolism. (3hr)
- Fate of glucose metabolism and its regulation in cell.- Glycolysis, TCA cycle, Pentose Phosphate Pathway(5hr)



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REFERENCES:

1. Principles of Biochemistry, Author- A.L. Lehninger
2. Fundamentals of Biochemistry, Author- J. L. Jain
3. Biochemistry, Author- Voet and Voet.
4. Textbook of Biochemistry- S.P. Singh.
5. Biochemistry, Author- Stryer.
6. Biochemistry- U. Satyanarayan
7. Introduction to protein structure, Authors- Branden and Tooze.
8. Fundamental Principles of Bacteriology, Author- A.J. Salle.
9. Principles of Biochemistry, Authors – Zubey, Parson and Vance.
10. Microbial Diversity, Author- D. Colwd.
11. Microbiology A Practical Approach Authors- Patel and Phanse, .
12. Nighojkar and Nighojkar, Experiments in Biotechnology.

INSTRUCTION STRATEGIES

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

TEACHING AND EXAMINATION

UNIT	Examination Scheme %Weightage	Teaching Scheme No. of Lecture
Unit 1	25	12
Unit 2	25	12
Unit 3	25	12
Unit 4	25	12
Total	100	48



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CMB 302- Immunology

RATIONALE: This course is designed to enable students to acquire basic understanding of the Immune system, Pathogenesis and disorders of human and also the various diseases occurred due to microorganisms.

LEARNING OUTCOMES:

- Understand the concept of Immune system and defense mechanism
- Gain knowledge about the various diseases caused by microorganisms and their awareness.

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

Subject Code	Subject Title	Teaching Scheme	Credits	Examination Scheme			Total Marks
		Theory Per Week		Hrs.	Max Marks		
					Mid Term	End Term	
CMB- 302	Immunology	3	3	48	30	70	100

COURSE CONTENT

<p>Unit I: Infection</p> <ul style="list-style-type: none">• Normal flora of human body: Skin, Respiratory tract, Digestive tract, genitourinary tract, eyes, mouth etc. (4hr)• Infection and its types. (2hr)• Transmission of Diseases through Air, Water and Soil(2hr)	<p>Number of lectures: 8 Weightage: 15%</p>
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<p>Unit-II Immune System and Immune Response</p> <ul style="list-style-type: none">• Types of immunity - Innate immunity and Acquired immunity ;herd immunity(4hr)• Immune Response: Characteristics, Primary and Secondary response(2hr)• Organs of Immune system- Spleen, thymus and lymph nodes(4hr)• Cells of Immune system- T cells- its types and receptors. B cells and its receptors. (3hr)<ul style="list-style-type: none">• Host defense mechanism- First, second and third line of host defense. (3hr)	<p>Number of lectures: 16 Weightage: 35%</p>
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KADI SARVA VISHWA VIDYALAYA
B.Sc Semester III Syllabus (W.E.F. June 2018)

Number of lectures: 12

Weightage: 25%

Unit III: Antigens and Antibodies

- Antigens- Properties and types, Adjuvants. Haptens (2hr)
- Immunoglobulins- structure , types and properties . (3hr)
- Agglutination and precipitation reactions. (2hr)
- Hemagglutination and PHA, ELISA, RIA, (3hr)
- Complement system- Components and biological activities. (2hr)

Number of lectures: 12

Weightage: 25%

Unit IV: Immune Disorders:

- Hypersensitivity - - Immediate and delayed type. (3hr)
- Immuno Deficiency disease- AIDS. (2hr)
- Autoimmunity- Classification of Autoimmune diseases. (2hr)
- Immunology of Transplantation: Classification of Transplants. (2hr)
- Allograft reaction-(mechanism), factors favouring Allograft survival.Graft v/s Host reaction. Immunology of Malignancy. (3hr)

REFERENCES:

1. Text Book of Microbiology – Ananthnarayan & Paniker.
2. Microbiology – Prescott, Harley & Klein.
3. Immunology, Author- J. Kuby.
4. Fundamental Immunology, Author– W.E. Paul.
5. Fundamentals of Immunology, Authors– Coleman, Lombord and Sicard.
6. Immunology – Weir and Steward.
7. Immunology, A Textbook, Author- C.V. Rao.
8. Lecture Notes in Immunology, Author- I.R.Todd.
9. Essentials of Immunology, Authors- Roitt, I.M.
10. Immunology-Understanding of Immune System, Author- Klaus D. Elgert (1996)

INSTRUCTION STRATEGIES

1. Interactions with the students to understand the level of students



KADI SARVA VISHWAVIDYALAYA
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2. Explaining & Discussing the major terminologies related to diseases and defense mechanism of human
3. Teaching the topics included in the syllabus with the help of teaching aids like OHP, LCD (Power point presentation), Notes, Question Banks, References and Reprints / Copy of Articles, Models, Diagrams
4. Assistance in solving of questions from our question bank.

TEACHING AND EXAMINATION

UNIT	Examination Scheme %Weightage	Teaching Scheme No. of Lecture
Unit 1	15	8
Unit 2	35	16
Unit 3	25	12
Unit 4	25	12
Total	100	48



KADI SARVA VISHWAVIDYALAYA
B.Sc Semester III Syllabus (W.E.F. June 2018)

SUBJECTIVE ELECTIVE PAPERS (Microbiology Course)

- Program will be offered as a part of sequential elective paper from semester-III to VI.
- Total two separate specializations are offered to B.Sc. microbiology students.
 - Food Microbiology
 - Pathology
- Students have to opt any one subject out of these two subjects from semester-III.
 - The same sequence of elective will be continued up to semester-VI.
 - For each elective program for separate semester wise modules (courses) have been designed as follows

Mid Term Examination Scheme (Only Internal Evaluation) : Total Marks - 40

Internal Theory: 20 Marks (One internal exam of 40 marks is to be conducted : $40/2=20$ Marks)

Internal Practical: 30 Marks (Internal Practical Exam of 20 marks is to be conducted + 10 marks of assignment / Journal / Report)

For more transparency for the practical exam, 1 internal examiner from base institute and another examiner will be from other KSV institute.

Internal Theory Examination Structure

Q : 1	Answer all questions each question carry 1 (one) mark. (Either from Theory / Practical) <ul style="list-style-type: none">• Short Questions• Multiple Choice Questions• Fill in the Blanks• True / False• Definition• Expand	10 Marks
Q : 2	Attempt Any 6 out of 8 (Short Note or Descriptive Questions)	30 Marks
	Total	40 Marks



KADI SARVA VISHWA VIDYALAYA
B.Sc Semester III Syllabus (W.E.F. June 2018)

SE MB 301 A Food Microbiology I

RATIONALE: This course is designed to enable students to acquire basic understanding of the Food microbiology. The understanding and knowledge of spoilage of food and preservation of food

LEARNING OUTCOMES:

- To impart knowledge of various areas related to Food science and technology,
- To enable the students for food composition and its physicochemical, nutritional, microbiological and sensory aspects,.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis End Term Examination conducted by University examination for 50 marks.

Subject Code	Subject Title	Credits	Theory+ Practical	End term Exam (Internal)		Total Marks
			Hrs.	Theory	Practical	
SE MB 301 A	Food Microbiology -I	2 (1 hr Theory + 2 hr Practical)	36	20	30	50

COURSE CONTENT

Number of lectures: 12

- Historical development of food science and technology (1hr)
- Evolution of Food Processing from prehistoric times till date. (1hr)
- Introduction to various branches of Food Science and Technology(1.5hr)
- Food as substrate for microorganisms (1.5hr)
- Cereals and Millets -Introduction, structure, composition and uses and by-products of cereals
Wheat- Structure composition and types of wheat
- Rice- Structure composition and types of rice. (3hr)
- Millets -Structure composition and types of Millet(2hr)
- Fruits and Vegetables –Classification of fruits and vegetables, general composition, enzymatic browning, names and sources of pigments, Dietary fibre.) (2hr)



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B.Sc Semester III Syllabus (W.E.F. June 2018)

LIST OF EXPERIMENTS (24 hours and 100%weightage)

• Orientation to working in a food analysis lab.(4hr)
• To study various Methods of sampling. (4hr)
• Identification of different non-perishable commodities-cereals, millets and their by-products. (4hr)
• To Study of different types of browning reactions. (4hr)
• To Study malting and germination of cereals and pulses. (4hr)
• To Study of fermentation and dextrinization. (4hr)

REFERENCES:

1. Microbiology, Authors- Pelczar, Chan and Kreig.
2. Microbiology- an Introduction- (8th Edn), Authors- Tortora, G.J., Funke, B.R., Case, C.L.
3. Food Microbiology. 2nd Edition By Adams
4. Basic Food Microbiology by Banwart George J.
5. Food Microbiology: Fundamentals and Frontiers by Dolle
6. Food Microbiology : William C. Fraizer , Tata MC Graw
7. Manay, S. & Shadaksharaswami, M., Foods: Facts and Principles, New Age Publishers, 2004
8. B. Srilakshmi, Food science, New Age Publishers, 2002 Meyer, Food Chemistry, New Age, 200
9. Kenneth F. et al, edited- Vol-1, 2, The Cambridge World History of Food, Cambridge Univ. Press, 2000. Martin Eastwood, Second

TEACHING AND EXAMINATION

Course Content	Examination Scheme %Weightage	Teaching Scheme No. of Lecture
Theory	40	12
Practical	60	24
Total	100	36



KADI SARVA VISHWA VIDYALAYA
B.Sc Semester III Syllabus (W.E.F. June 2018)

SE MB- 301-B Pathology –I

RATIONALE: This course is designed to enable students to acquire basic understanding of the Immune system, Pathogenesis of human and also the various diseases occurred due to microorganisms.

LEARNING OUTCOMES:

- Concept of human tissues and cells
- Gain knowledge about the various cell structure and functions.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis End Term Examination conducted by University examination for 50 marks.

Subject Code	Subject Title	Credits	Theory+ Practical	End term Exam(Internal)		Total Marks
			Hrs.	Theory	Practical	
SE MB- 301 B	Pathology -I	2 (1 hr Theory + 2 hr Practical)	36	20	30	50

COURSE CONTENT

Number of lectures: 12

Introduction to pathology

- Normal Cell(1hr)
- Cell Injury- types of cell injury, etiology of cell injury, morphology of cell injury, cellular swelling.(1hr)
- Bacterial infection - Fungal infection(2hr)
- Cell death: types- autolysis, necrosis, apoptosis & gangrene(3hr)
- Cellular adaptations-atrophy, hypertrophy, hyperplasia & dysplasia.(3hr)
- Neoplasia (1hr)
- Inflammation (1hr)



KADI SARVA VISHWA VIDYALAYA
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LIST OF EXPERIMENTS (24 hours and 100%weightage)

• Principles of sample collection for Hematology and Clinical Pathology (3hr)
• Histopathology and cytology specimens,(3hr)
• To study physical, chemical and microscopic urine analysis(4hr)
• Stool examination(3hr)
• Permanent slide study of different types of cells(4hr)
• Waste disposal and universal precautions.(2hr)
• Cytology of body fluids – Staining and interpretation(5hr)

REFERENCES:

1. Experimental Microbiology – R.J.Patel
2. Laboratory exercises in Microbiology – Robert.A.Pollack
3. Laboratory exercises in Microbiology – Harley Prescott
4. Experimental Microbiology – Arora and Arora
5. Text Book of Pathology – V. Krishna
6. Text Book of Pathology – Datta
7. Mini Atlas Pathology – Harsh Mohan
8. Robbins Basic Pathology – Vinay Kumar, Abul K Abbas, Jon C. Aster

TEACHING AND EXAMINATION

Course Content	Examination Scheme %Weightage	Teaching Scheme No. of Lecture
Theory	40	12
Practical	60	24
Total	100	36



KADI SARVA VISHWAVIDYALAYA
B.Sc Semester III Syllabus (W.E.F. June 2018)

TEXT BOOKS:

1. Heat and Thermodynamics by Mark W. Zeemansky
2. A text book of OPTICS by Dr. N. Subrahmanyam, Brijlal, Dr. M. N. Avadhanulu - S.Chand
3. Elements of Solid State Physics by J. P. Srivastava.

REFERENCES:

1. Basic and applied Thermodynamics by P. K. Nag.
2. Thermodynamics and Statistical Physics by Singhal- Agarwal-PrakashPragtiPrakashan, Meerut.
3. University Physics by Sears, Zeemansky and Young. (6th Edition) Narosa Publication, New Delhi.
4. Heat Thermodynamics and Statistical Physics by Brijlal, Dr. Subrahmanyam, P.S.HemneS.Chand.
5. Waves and Oscillations by N Subramanyam, Brijlal.
6. A Text book of Light by D.N.Vasudeva - S. Chand & Co.
7. Fundamentals of Optics by Jonkin's and White
8. Optics by AjoyGhatak
9. Principles of Optics by B.K. Mathur
10. Concept of Modern Physics by Besier McGraw-Hill
11. Properties of Matter by Brijlal, N. Subrahmanyam, S.Chand.
12. Solid State Physics by Ajay Kumar Saxena (Macmillan India Limited)
13. Introduction to Solid State Physics by C. Kittel (John Willey)
14. Fundamental of Solid State Physics by Saxena, Gupta, Saxena (PragatiPrakashan)
15. Elements of Solid State Physics by J. P. Srivastava (PHI).

Note:

A good number of numerical examples are expected to be covered during the prescribed lectures.

INSTRUCTION STRATEGIES

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

TEACHING AND EXAMINATION

UNIT	Examination Scheme % Weightage	Teaching Scheme No. of Lecture
Unit 1	33	16
Unit 2	34	16
Unit 3	33	16
Total	100	48



KADI SARVA VISHWAVIDYALAYA
B.Sc Semester III Syllabus (W.E.F. June 2018)

CPH-302 Basics Physics –II

RATIONALE: This course is designed to enable students to acquire basic understanding of the Physical world, its origin and structure to help the potential application of the unexplored and unidentified organisms in the industry.

LEARNING OUTCOMES:

- Understand the concept of origin of Physical Science.
- Develop a concrete understanding of the Physical systems around us.
- Gain knowledge about the various laws of nature, new frontier of physics with potential applications in our day by day life.

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

Subject Code	Subject Title	Credit s	Theory			Total Marks
			Hrs.	Max Marks		
				Mid Term	End Term	
CPH- 302	Basic Physics – II	3	48	30	70	100

COURSE CONTENT

Unit – 1

Lectures – 16

Weightage – 33%

Electrostatics:

Introduction-Gradient, Divergence and curl, Divergence of electrostatic field, curl of electrostatic field, Introduction to potential, Poisson's equation and Laplace's equation, The potential of a localised charge distribution, The work done in moving a charge, the energy of a point charge distribution, the energy of a continuous charge distribution, Illustrative Examples.

Unit – 2

Lectures – 16

Weightage – 34%

Transistors

Basics of Transistor, Transistor current component, Leakage current, Characteristics of transistor, Common base configuration static characteristics, Common emitter configuration static characteristics, importance of characteristics, Load Line, Operating point, Illustrative Examples.

Principle and working of JFET, Importance of JFET, Difference between JFET and BJT, Characteristics of JFET, Advantages of JFET, UJT, Characteristics of UJT, Advantages of UJT, Application of UJT, Illustrative Examples.

Unit – 3

Lectures – 16

Weightage – 33%

Classical Mechanics

Introduction to Oscillations, Simple Harmonic Oscillator, Energy of a Simple Harmonic Oscillator, Simple Pendulum, Compound Pendulum, Oscillations of a mass attached to the spiral spring, Damped harmonic oscillation, Forced Oscillation, Coupled Oscillations. Illustrative examples.



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TEXT BOOKS :

1. Electrodynamics by D. J. Griffiths.
2. Principles of Electronics by V. K. Mehta & Rohit Mehta (S.Chand)
3. Classical Mechanics by Takwale & Puranik.

REFERENCES:

1. Electromagnetics by B.B. Laud, New Age Int. Publisher.
2. Electricity and Magnetism by Maharajan and Rangwala, THM
3. Electricity and Magnetism Berkeley Physics course Vol.-II by EDWARD M PURCELL, McGraw Hill Pub.
4. Hand book of Electronics by Gupta & Kumar 30th Revised Edition, 2002 PragatiPrakashan
5. Electronics and Radio Engineering by M.L. Gupta (9th Edition-2002)
6. Electronic Devices and Circuits by A. Mottershead Prentice – Hall of India.
7. Integrated Electronics by Millman & Halkias
8. Basic Electronics and Linear Circuits by N.N. Bhargava, D.C. Kulshreshtha, S.C. Gupta
9. Classical Mechanics by Goldstein.

Note:

A good number of numerical examples are expected to be covered during the prescribed lectures.

INSTRUCTION STRATEGIES

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

TEACHING AND EXAMINATION

UNIT	Examination Scheme % Weightage	Teaching Scheme No. of Lecture
Unit 1	33	16
Unit 2	34	16
Unit 3	33	16
Total	100	48



KADI SARVA VISHWAVIDYALAYA
B.Sc Semester III Syllabus (W.E.F. June 2018)

SUBJECTIVE SPECIALIZATION PAPERS (Physics Course)

- Program will be offered as a part of sequential elective paper from semester-III to VI.
- Total three separate specialization are offered to B.Sc. chemistry students.
(4) Engineering Physics
(5) Applied Physics
- Students have to opt any one subject out of these three subjects from semester-III.
- The same sequence of elective will be continued up to semester-VI.
- For each elective program for separate semester wise modules (courses) have been designed as follows.....

Mid Term Examination Scheme (Only Internal Evaluation) : Total Marks - 40

Internal Theory: 20 Marks (One internal exam of 40 marks is to be conducted : $40/2=20$ Marks)

Internal Practical: 30 Marks (Internal Practical Exam of 20 marks is to be conducted + 10 marks of assignment / Journal / Report)

For more transparency for the practical exam, 1 internal examiner from base institute and another examiner will be from other KSV institute.

Internal Theory Examination Structure

Q : 1	Answer all questions each question carry 1 (one) mark. (Either from Theory / Practical) <ul style="list-style-type: none">• Short Questions• Multiple Choice Questions• Fill in the Blanks• True / False• Definition• Expand	10 Marks
Q : 2	Attempt Any 6 out of 8 (Short Note or Descriptive Questions)	30 Marks
	Total	40 Marks



KADI SARVA VISHWA VIDYALAYA
B.Sc Semester III Syllabus (W.E.F. June 2018)

SE PH 301-B APPLIED PHYSICS-1

RATIONALE: This course is designed to enable students to acquire understanding about development and measurement of applied Physics.

Subject Code	Subject Title	Credits	Theory/Practical				Total Marks
			Hrs.	Max Marks			
				Mid Term Theory	Mid Term Viva	End Term	
SE PH 301-B	Applied Physics-1	2	24	20	30	--	50

COURSE CONTENT

Unit – 1

Lectures – 12

Weightage – 50%

Measuring Devices

Vernier Calliper, Micrometer Screw Guage, Spherometer, Illustrative Examples

Optical:- Spectrometer, Travelling Microscope, Illustrative Examples

Microscope: Simple & Compound Illustrative Examples

Telescopes:- Astronomical, Terrestrial, Galilean, Newton's, Resolving Power of a Telescope, Illustrative Examples

Unit – 2

Lectures – 12

Weightage – 50%

Electrical Instrumentation

Analog Meters & Digital Meters: Current meter & Voltmeter.

Galvanometer: Introduction, Theory, Sensitivity and Figure of Merit of Galvanometer. Illustrative Examples

Wheatstone Bridge: Introduction, Theory with figure, Construction, Advantage & Disadvantage. Illustrative Examples

Post-Office Box: Introduction, Theory, Circuit Diagram, Theoretical Circuit diagram, explanation of working with necessary formula. Illustrative Examples

References:

1. Experimental books for Physics.
2. Concept of Physics By H. C. Verma
3. An Advanced Course in Practical Physics by D.Chattopadhyay, P.C. Rakshit, B.SAHA, New Central Book Ltd.
4. A textbooks of Optics by Dr. N. Subrahmanyam, Brijlal, Dr. M. N. Avadhanulu – S.Chand



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TEACHING AND EXAMINATION

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



KADI SARVA VISHWAVIDYALAYA
B.Sc Semester III Syllabus (W.E.F. June 2018)

CMAT 301- Calculus and Linear Algebra

Rationale:

This course is designed to enable students to acquire the understanding and practice the applications of Calculus and Vector spaces.

Learning Outcome:

After successfully completion of the course, the student will be able to

- Understand the concept of limit and continuity and apply it to various types of problems
- Understand the derivative of a variable and of implicit functions.
- Know about vector space, dimension and basis.
- Understand the concept of linear transformations

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

Subject Code	Subject Title	Credits	Theory			Total Marks
			Hrs.	Max Marks		
				Mid Term	End Term	
CMAT- 301	Calculus and Linear Algebra	3	48	30	70	100

COURSE CONTENT

Number of lectures: 12	Weightage: 25%
Unit-1 : Limit, Continuity and Partial Derivatives	
Function of several variables, their limits and continuity, partial derivatives, Differentiability and differential, Derivatives of implicit functions and applications	

Number of lectures: 12	Weightage: 25%
Unit-2 : Application of Partial Derivatives	
Euler's Theorem on homogenous function, Extrema of a function of several variables, Application of Lagrange multipliers to find the absolute extreme for a function, Taylor and Maclaurin's expansion for function of two variables (With Proof). Tangent plane and normal to surfaces.	

Number of lectures: 12	Weightage: 25%
Unit-III : Vector Space	
Vector spaces, Subspaces, Span of a set, Linear dependence and Independence, Dimension and basis.	



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Number of lectures: 12

Weightage: 25%

Unit-IV : Linear Transformations

Definitions and examples, Range and kernel of a linear map, Rank and nullity, Inverse of a linear transformation, The space $L(U,V)$, Composition of linear maps, Operator equations.

REFERENCE BOOKS:

1. Differential Calculus, by Shantinakaran.
2. Vector Analysis, by Murry R. Spiegel.
3. An Introduction to linear algebra, by V. Krishnamurthy, JL Arora, East West Press Pvt Ltd, New Delhi.
4. Advanced Calculus, by DV Widder, Prentice Hall, New Delhi
5. Advanced Calculus, by R C Buck, MacMillan
6. Linear Algebra, Ramchandra Rao, P. Bhimasankar, Tata McGraw Hill
7. Linear Algebra, S K Berberion, Oxford University Press
8. Linear Algebra, Sharma and Vashishtha, Krishna Prakashan, Meerut
9. Linear Algebra, Gupta KP, PragatiPrakshan, Meerut

TEACHING AND EXAMINATION

UNIT	Examination Scheme %Weightage	Teaching Scheme No. of Lecture
Unit 1	25	12
Unit 2	25	12
Unit 3	25	12
Unit 4	25	12
Total	100	48



KADI SARVA VISHWAVIDYALAYA
B.Sc Semester III Syllabus (W.E.F. June 2018)

CMAT 302- Numerical Analysis

Rationale:

This course is designed to enable students to acquire the understanding of numerical analysis.

Learning Outcome:

After successfully completion of the course, the student will be able to

- Understand the concept of interpolation and extrapolation
- Understand the concept of numerical differential and apply to various problems
- Understand the concept of numerical differentiation and its applications

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

Subject Code	Subject Title	Credits	Theory			Total Marks
			Hrs.	Max Marks		
				Mid Term	End Term	
CMAT- 302	Numerical Analysis	3	48	30	70	100

COURSE CONTENT

Number of lectures: 12 **Weightage: 25%**

Unit-1 : Finite Differences table and theory of Interpolation:

Introduction to Numerical Methods, Approximations and Errors in Computation. Interpolation, Extrapolation, Ascending and Descending differences, Symbolic operators, Difference polynomials, Gregory- Newton's Forward and backward interpolation formula.

Number of lectures: 12 **Weightage: 25%**

Unit-2 : Divided Differences:

Newton's divided difference interpolation formula, Lagrange's interpolation formula for equal and unequal intervals.

Number of lectures: 12 **Weightage: 25%**

Unit-III : Central Differences interpolation formula:

Gauss forward and backward interpolation formula, Sterling interpolation formula, Bessel's interpolation formula.



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Number of lectures: 12

Weightage: 25%

Unit-IV : Numerical Differentiation and Integration:

Numerical differentiation using Newton's forward and backward method, Trapezoidal rule, Simpson's 1/3 rule, Simpson's 3/8th rule

REFERENCES:

1. Numerical Methods in Engineering and Science, Dr B.S Grewal, Khanna Publication.
2. Numerical Analysis and Computational Procedures, S.A Mollah, New Central Book Agency, Calcutta.
3. Numerical Analysis, Kunz, McGraw Hill
4. Methods in Numerical Analysis, K.W Nelson , Mac Millan.
5. Numerical Methods, Dr. N.Ch., S.N. Iyenger, Dr V.N. Vedomurthy, Vikas Publishing House Pvt. Ltd

UNIT	Examination Scheme %Weightage	Teaching Scheme No. of Lecture
Unit 1	25	12
Unit 2	25	12
Unit 3	25	12
Unit 4	25	12
Total	100	48



KADI SARVA VISHWA VIDYALAYA
B.Sc Semester III Syllabus (W.E.F. June 2018)

SUBJECTIVE SPECIALIZATION PAPERS (Mathematics Course)

- Program will be offered as a part of sequential elective paper from semester-III to VI.
- Total three separate specialization are offered to B.Sc. chemistry students.
(6) Business Mathematics
(7) Discrete Mathematics
- Students have to opt any one subject out of these three subjects from semester-III.
- The same sequence of elective will be continued up to semester-VI.
- For each elective program for separate semester wise modules (courses) have been designed as follows.....

Mid Term Examination Scheme (Only Internal Evaluation) : Total Marks - 40

Internal Theory: 20 Marks (One internal exam of 40 marks is to be conducted : $40/2=20$ Marks)

Internal Practical: 30 Marks (Internal Practical Exam of 20 marks is to be conducted + 10 marks of assignment / Journal / Report)

For more transparency for the practical exam, 1 internal examiner from base institute and another examiner will be from other KSV institute.

Internal Theory Examination Structure

Q : 1	Answer all questions each question carry 1 (one) mark. (Either from Theory / Practical) <ul style="list-style-type: none">• Short Questions• Multiple Choice Questions• Fill in the Blanks• True / False• Definition• Expand	10 Marks
Q : 2	Attempt Any 6 out of 8 (Short Note or Descriptive Questions)	30 Marks
	Total	40 Marks



KADI SARVA VISHWAVIDYALAYA
B.Sc Semester III Syllabus (W.E.F. June 2018)

SE Math 301-A : Business Mathematics- I

RATIONALE: This course is designed to enable students to acquire understanding about logic, permutations and combinations.

Subject Code	Subject Title	Credits	Theory/Practical				Total Marks
			Hrs.	Max Marks			
				Mid Term Theory	Mid Term Viva	End Term	
SE Math -301-A	Business Mathematics- I	2	24	20	30	--	50

COURSE CONTENT

Unit-I	Number of lectures: 12	Weightage: 50%
Unit:1 Logic: [only examples] Logical Statements, Truth table, Negation, Compound statements, Tautologies and Contradiction, Negation of Compound statements, Propositions, Conditional and Bi-Conditional statements. Set Theory: [only examples] Definition and methods of sets, types of sets, Venn diagrams, Operations on sets, De-Morgan's law, Finite and infinite sets.		
Unit-II	Number of lectures: 12	Weightage: 50%
Unit:2 Permutations and Combinations: [only examples] Fundamental rules of counting, Definition of Permutations and Permutation of n different things, Permutation of repeated things, Circular Permutation, Definition of Combination standard results and examples.		

REFERENCES:

- (1) Business Mathematics, D.C. Sancheti & V.K. Kapoor, S Chad & Sons Publication, New Delhi.
- (2) Business Mathematics, B.S. Shah Prakashsan, Ahmedabad.

INSTRUCTION STRATEGIES

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

TEACHING AND EXAMINATION

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



KADI SARVA VISHWAVIDYALAYA
B.Sc Semester III Syllabus (W.E.F. June 2018)

SE Math- 301-B : Discrete Mathematics- I

Rationale: This course is an introduction to the study of Discrete Mathematics, a branch of contemporary mathematics that develops reasoning and problem-solving abilities, with an emphasis on proof.

Subject Code	Subject Title	Credits	Theory/Practical				Total Marks
			Hrs.	Max Marks			
				Mid Term Theory	Mid Term Viva	End Term	
SE Math -301-B	Discrete Mathematics- I	2	24	20	30	--	50

COURSE CONTENT

Unit-I	Number of lectures: 12	Weightage: 50%
Mathematical Logic: Introduction, Connectives, statement formulas, principle of substitution, validity of arguments, Quantifiers, Proof techniques.		
Unit-II	Number of lectures: 12	Weightage: 50%
Lattices: Relation and ordering, partially ordered sets, Hasse diagram, Lattices as poset, properties of lattices, Lattices as algebraic systems, Sub lattices		

REFERENCES:

- (1)Shoenfield- " Mathematical Logic "- Addison Wesley.
- (2) Change, C. L and Lee, R.T.C – " Symbolic Logic and Mechanical Theorem Proving", Academic Press.
- (3)Discrete mathematics and its applications- Kenneth H. Rosen, 6thEdition ,McGraw International Edition
- (4) Schaum's Outline of Theory and Problems of Discrete Mathematics, Marc Lipson and Seymour Lipschutz

INSTRUCTION STRATEGIES

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

TEACHING AND EXAMINATION

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



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EGC-301 Social Service Scheme - 1

RATIONALE: This course is designed to enable students to acquire the core concept of importance of National service scheme.

LEARNING OUTCOMES: The main objective is to ensure that students learn the essential concepts of NSS and its role in society. The base functions of NSS like organizing, controlling, guiding, leading as a young citizen of country to handle any crucial societal or natural sizzling problems.

Subject Code	Subject Title	Credits	Theory/Practical				Total Marks
			Hrs.	Max Marks			
				Mid Term Theory	Mid Term Practical	End Term	
EGC 301	Social Service Scheme – 1	2	36	20	30	--	50

OBJECTIVES

1. Develop a sense of social responsibility
2. Being Learned student, acquire leadership capacity to get rid form Emergencies And Natural Disasters
3. Identify the Needs and Problems o ft The Community And involvement of youth in Problem-Solving

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students in written examination, but also to motivate them for better performance as a citizen of country. Students are evaluated on the basis of Internal Examination conducted by College and on basis of their project work performances as mentioned in examination scheme. Area of project work will be related to their course content.

Mid Term Examination Scheme (Only Internal Evaluation) : Total Marks - 40

Internal Theory: 20 Marks (One internal exam of 40 marks is to be conducted : $40/2=20$ Marks)
Field Work : 20 Marks
Assignment / Report : 10 Marks

Internal Theory Examination Structure

Q : 1	Answer all questions each question carry 1 (one) mark. (Either from Theory / Practical) <ul style="list-style-type: none"> • Short Questions / Multiple Choice Questions / Fill in the Blanks • True / False / Definition / Expand 	10 Marks
Q : 2	Attempt Any 6 out of 8 (Short Note or Descriptive Questions)	30 Marks
	Total	40 Marks



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COURSE CONTENT: Social Service Scheme - 1

UNIT NO	TITLE OF UNIT AND DETAILS	INSTRUC TION HOURS	WEIGHT AGE In %
1.	Introduction to and Basic concepts of Social Service <ul style="list-style-type: none">• History and Objectives of NSS• NSS Code: Logo, Flag, Motto, S NSS song, badge• NSS structure and its responsibilities	06	30%
2.	Social Service Programs and Activities <ul style="list-style-type: none">• Glance of SS activities: Special camping, Day camps• Concepts of adoption of village/slums• Financial pattern of the scheme• Co-ordination with various agencies	08	30%
3.	Social Service in Various Sectors <ul style="list-style-type: none">• Projects for social service (Community service, awareness of people regarding national issues, awareness of people for their social responsibilities, Involvement of students in cleanliness (Swachchhata), Tree plantation, youth empowerment etc.)• Maintenance of the dairy and Report preparation.	10	40 %



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FCG 301- Basic English – III

RATIONALE: This course is designed to enable students to acquire basic understanding of English grammar. The course would help students to fortify their knowledge of English and strengthen their basic communication abilities.

LEARNING OUTCOMES:

- Understand the functions and usage of change of voice, modal auxiliaries and adjectives/adverbs.
- Develop language skills of reading through filling in appropriate words in blanks, correcting errors, choosing correct forms out of alternative choices, joining clauses, sentences as directed, replacing indicated sections with single word / opposite / synonyms etc.
- Acquire interest in English language and literature through textbook lessons.
- Acquire additional vocabulary as prescribed in the textbook through use of idioms and phrases in meaningful sentences.
- Acquire the knowledge of different kinds of letterwriting.

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

Subject Code	Subject Title	Credits	Theory			Total Marks
			Hrs.	Max Marks		
				Mid Term	End Term	
FCG - 301	Basic English III	2	24	15	35	50

TEACHING AND EXAMINATION

UNIT	Examination Scheme %Weightage	Teaching Scheme No. of Lecture
Unit 1	33	8
Unit 2	17	4
Unit 3	33	8
Unit 4	17	4
Total	100	24



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COURSE CONTENT

Unit 1: Lesson 3 to 7 'Glimpses of Life – An Anthology of Short Stories (Orient Black Swan) Lesson-3 The Gift of Magi by O. Henry • Lesson-4 The Child by Premchand • Lesson-5 The Last Salvation by R.P. Sisodia Lesson-6 I Prepare to go to Coimbatore Lesson-7 A Slip of the Tongue by F.E.B. Gray	Number of lectures: 8	Weightage:	33%
Unit 2: Vocabulary (Text based) from Lesson 3 to 7 Use of Idioms and Phrases in meaningful sentences	Number of lectures: 4	Weightage:	17%
Unit 3: Usage of English Grammar • Modal Auxiliaries • Adjectives • Adverbs Public Speaking Skills • Speech style • Barriers to speaking • Types of speaking	Number of lectures: 8	Weightage:	33%
Unit 4: Writing Skill- Letter Writing (Formal and Informal) • Complimentary • Request • Regret • Invitation	Number of lectures: 4	Weightage:	17%

REFERENCES

1. High School English Grammar – Wrenn & Martin
2. Contemporary English Grammar – David Green
3. Communicative Skills- Anasuya Kalavar, Tech-Max publication, Pune

INSTRUCTION STRATEGIES

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



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PCH 301-Chemistry Practical III

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

LEARNING OUTCOMES:

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

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

Subject Code	Subject Title	Credits	External Practical		Total Marks
			Hrs.	Max Marks	
PCH- 301	Chemistry Practical–III	3	6 hrs	100	100

LIST OF EXPERIMENTS

Laboratory Course –I
Organic Chemistry

(Any 7)

(3 hours per practical)

Separation and qualitative determination of binary organic mixture (Only Water Insoluble Solid Compounds taken) & preparation of derivative of any one compound

Laboratory Course -II
Physical Chemistry

(Any 7 out of 10)

(3 hours per practical)

Conductometric titrations

1. To determine the strength of the given mixture of acids by conductometric titrations (HCl / CH₃COOH Vs NaOH)
2. To determine the strength of the given strong acid/base by conductometric titrations (HCl Vs NH₄OH)

pH metric titrations

1. Calibration of pH meter using 4 pH buffer solution and determine the strength of the given acid/base using pH metric titrations (HCl Vs NaOH)
2. To determine the Dissociation constant of the acid of mixtures of CH₃COONa and CH₃COOH by pH meter



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Refractometry

1. To determine the specific refraction and molar refraction of the given liquid A, B and mixture C (A+B) and calculate the percentage composition of A and B in the mixture C by Abbe's Refractrometer
2. To determine the molar refraction $\text{CH}_3\text{COOC}_2\text{H}_5$, $\text{CH}_3\text{COOC}_3\text{H}_7$ and $\text{CH}_3\text{COOC}_4\text{H}_9$ and show the constancy of reaction equivalent of $-\text{CH}_2-$ Group by Abbe's Refractrometer

Viscometry

1. To determine the viscosity of different mixtures of liquid A and B and determine the percentage composition of unknown mixture by graphical method

Stalagmometry

1. To determine the surface tension and compare cleaning-efficiency of two samples of a detergent or soap with stalagmometer

Chemical kinetics

1. To study the kinetics of the reaction of decomposition of H_2O_2 catalysis by iodine ion (Clock reaction)

Thermochemistry

1. Find the solubility and heat of solution of the given organic acid at two different temperatures

INSTRUCTION STRATEGIES

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



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PCH 301- Chemistry Practical III

PRACTICAL EXAMINATION PATTERN FOR CHEMISTRY:

- One day per batch(27 to 30 student per batch)
- Certified Journals are compulsory for the exam

Laboratory Course –I Organic Chemistry Viva voce	3.5 hrs	40 marks 5 marks
Laboratory Course -II Physical Chemistry Viva voce	3.5 hrs	40 marks 5 marks
Journal		10 marks
Total marks		100 marks



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PPH 301-Physics Practical-III

RATIONALE: This course is designed to enable students to acquire on hand basic understanding of the physical phenomena, fundamental laws of physics, as well as on hand experience of handling the various instruments which have much use in industries as well as in research institutes. These experiments make the students capable and competent to work in physics related industries and research institutes

LEARNING OUTCOMES:

- Understand the basic principles and of physics.
- Develop an understanding about the handling of various instruments.
- Develop an analytical attitude for physical laws through simple and basic experiments.
- Gain knowledge and expertise in experimental physics field.

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

Subject Code	Subject Title	Credits	External Practical		Total Marks
			Hrs.	Max Marks	
PPH- 301	Physics Practical-III	3	6 Hrs	100	100

LIST OF EXPERIMENTS

Laboratory Course-1: Non Circuitry Experiments

1. To find the viscosity of a fluid using coaxial viscometer.
2. To determine wave length of bright lines of mercury light using diffraction grating.
3. To measure the resolving power of Telescope.
4. To find the wavelength of light using an "A" Edser Diffraction Pattern.
5. To Determine the wavelength of a given laser source using diffraction grating.
6. To find Absolute Value of Capacitor using Ballistic Galvanometer (B.G.).
7. Determination of cardinal points and 'do' using Searl's Goniometer.

Laboratory Course-2: Circuitry Experiments

7. To find the ratio of e/k using Power Transistor
8. To compare the Capacity of two capacitors (C_1/C_2) by De Sauty method.
9. To estimate the value of low Resistance by Projection Method for Electric Potential.
10. To study Common Base Transistor Characteristics (PNP).
11. To find the characteristics of JFET & Determination of μ , r_d , gm
12. Construction of AND, OR, NOT Gates using NAND & NOR Universal gates.

INSTRUCTION STRATEGIES

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



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PPH 301-Physics Practical-III

PRACTICAL EXAMINATION PATTERN FOR PHYSICS:

- One day per batch(27 to 30 student per batch)
- Certified Journals are compulsory for the exam

PRACTICAL- I Non Circuitry Experiment Viva voce	3 hrs	40 marks 5 marks
PRACTICAL- II Circuitry Experiments Viva voce	3 hrs	40 marks 5 marks
Journal		10 marks
Total marks		100 marks



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PMAT- 301 : Mathematics Practical – I

Subject Code	Subject Title	Credits	External Practical		Total Marks
			Hrs.	Max Marks	
PCMAT-301	Mathematics Practical – 1	3	6 Hrs	100	100

Practical's based on Calculus & Linear Algebra:

1. Application of Limit and Continuity (Two Practicals)
2. Application of Partial Derivatives (Two Practicals)
3. Application of Lagrange's method
4. Application of Euler's theorem
5. Application of Taylor's and Maclaurin's theorems.
6. Applications of Vector Space, subspaces
7. To Expand linearly independent set upto a basis of a vector space
8. Verification on Dimension theorem and linear transformation
9. Verifications on Rank-Nullity theorem
10. To find the inverse of a Linear transformations and linear maps

Practical's based on Numerical Analysis :

1. Application of Gregory-Newton forward formula.
2. Application of Gregory-Newton backward formula.
3. Applications of Newton's divided difference formula.
4. Application of Lagrange's interpolation formula for equal and unequal intervals.
5. Application of Gauss forward and backward interpolation formula.
6. Application of Sterling interpolation formula.
7. Application of Numerical differentiation using Newton forward formula.
8. Application of Numerical differentiation using Newton backward formula
9. Application of Trapezoidal rule.
10. Application of Simpson's $1/3^{\text{rd}}$ rule & $3/8^{\text{th}}$ rule.



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PMAT 301 : Mathematics Practical – I

PRACTICAL EXAMINATION PATTERN FOR MATHEMATICS:

- One day per batch(27 to 30 student per batch)
- Certified Journals are compulsory for the exam

PRACTICAL- I Calculus and Linear Algebra Viva voce	3 hrs	40 marks 5 marks
PRACTICAL- II Numerical Analysis Viva voce	3 hrs	40 marks 5 marks
Journal		10 marks
Total marks		100 marks



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PMB 301 : Microbiology Practical- III

RATIONALE: This course is designed to enable students to acquire basic understanding of the microbiological physiology and nutrition and its metabolic diversity.

LEARNING OUTCOMES:

- Understand the concept of nutrition of the bacteria.
- Develop an understanding of the growth and various parameters affecting to the growth.
- Gain knowledge about the microbial control and their inhibition..

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

Subject Code	Subject Title	Credits	Practical		Total Marks
			Hrs.	Max Marks	
PMB- 301	Microbiology Practical- III	3	6	100	100

LIST OF EXPERIMENTS

1. Preparation of standard solutions
2. Qualitative analysis of carbohydrates
3. Qualitative analysis of Protein
4. Quantitative estimation of protein by Folin Lowry's Method.
5. Quantitative estimation of carbohydrates by Nelson Smogyi's Method.
6. Estimation of aminoacid by Ninhydrin method.
7. Estimation of reducing sugar by Cole's Method
8. Estimation of Sugar by Anthrone method.
9. Fatty acid estimation
10. Blood Grouping.
11. Estimation of haemoglobin by Sahli's method.
12. Total count of W.B.C.
13. Total count of R.B.C.



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14. Differential W.B.C. count.
15. Flocculation reaction- VDRL
16. Agglutination reaction- Widal test,
17. Immuno-diffusion techniques- ODD and RID.

B.Sc. MICROBIOLOGY Semester- III PMB-301
Practical Examination Skeleton

TIME : 10:00 To 5:00

TOTAL MARKS- 100

EX 1 Write the Principle and Working of Instrument 5

- (A) Microscope
- (B) Autoclave
- (C) Hot Air oven
- (D) Incubator
- (E) Centrifuge
- (F) pH meter
- (G) Colorimeter

EX 2 Write the Principle , Requirement and Procedure for the given experiment and Perform it. 25

- (A) To perform qualitative analysis of Carbohydrates
- (B) To perform qualitative analysis of Proteins
- (C) To Estimate protein by Folin Lowry's Method.
- (D) To Estimate carbohydrates by Nelson Smogyi's Method.
- (E) To Estimate amino acid by Ninhydrin Method.
- (F) To Estimate reducing sugar by Cole's Method
- (G) To Estimate Sugar by Anthrone Method.
- (H) To Estimate Free Fatty acid

EX 3 Write the Principle , Requirement and Procedure for the given experiment and Perform it. 25

- (A) To Determine your own Blood Group.
- (B) To Determine haemoglobin concentration by Sahli's method from your own Blood.
- (C) To Determine Total count of W.B.C. from your own Blood
- (D) To Determine Total count of R.B.C. from your own Blood
- (E) To Determine Differential count of W.B.C. from your own Blood



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EX 4	Write the Principle , Requirement and Procedure for the given experiment	10
	(A) To Perform Flocculation Reaction- VDRL(Venereal Disease Research Laboratory test)	
	(B) To Perform Agglutination reaction- Widal test,	
	(C) To Perform Immunodiffusion Techniques ODD (Osterlony Double Diffusion) and RID(Radial Immuno Diffusion)	
Ex 5	Spotting	10
EX 6	Viva	15
EX 7	Journal and Slide Box	10