

**B.Sc. Biochemistry
Syllabus (MCQ Pattern)**

(Revised New Syllabus Effective from June 2014)

**B.Sc. Biochemistry
Second Year (Semester – III)**

Sr.No.	Course No.	Course Title	Periods /Week	Total Periods	Marks
		Compulsory English	3	45	50
		Second Language Hindi	3	45	50
XIII	BCH-301	Advanced Chemistry	03	45	50
XIV	BCH-302	Advanced Microbiology	03	45	50
XV	BCH-303	Enzymology-I	03	45	50
XVI	BCH-304	Genetics	03	45	50
XVII	BCH-305	Cell Biology	03	45	50
XVIII	BCH-306	Human Physiology	03	45	50
LC-8	BCH-307	Laboratory Course Chemistry – I	04	60	50
LC-9	BCH-308	Laboratory Course Microbiology & Genetics & Cell Biology	04	60	50
LC-10	BCH-309	Laboratory Course Enzymology/ Human Physiology	04	60	50

**B.Sc. Biochemistry
Second Year Semester – IV**

Sr.No.	Course No.	Course Title	Periods /Week	Total Periods	Marks
		Compulsory English	3	45	50
		Second Language Hindi	3	45	50
XIX	BCH-401	Fermentation, Distillery & Beverage	03	45	50
XX	BCH-402	Advanced Biotechnology	03	45	50
XXI	BCH-403	Enzymology-II	03	45	50
XXII	BCH-404	Nutritional Biochemistry	03	45	50
XXIII	BCH-405	Molecular Biology-I	03	45	50
XXIV	BCH-406	Membrane Biochemistry	03	45	50
LC-11	BCH-407	Laboratory Course Fermentation, Distillery & Beverage	04	60	50
LC-12	BCH-408	Laboratory Course Biotechnology/ Molecular Biology	04	60	50
LC-13	BCH-409	Laboratory Course Enzymology/ Nutritional Biochemistry	04	60	50

B.Sc. Biochemistry
Second Year Semester – III
Advanced Chemistry
(BCH-301)

MARKS-50

Periods: 45

UNIT – I Heterocyclic Compounds **12**

Introduction, importance, classification, five and six membered ring containing one hetero atom, structure, synthetic method, Physical and chemical of followings.

- Furan
- Pyrrol
- Thio-Phene
- Pyran
- Quinoline
- Indol

UNIT– II Organic Spectroscopy **10**

UV and visible spectroscopy – absorption laws, types of electronic transitions, auxochrome, chromophore, conjugated dienes, Woodward – Fieser based numerical for calculating λ_{max} .

IR spectroscopy – molecular vibrations, frequency, types of vibrations. IR region, applications of IR spectra to find out the structures of alkenes, aromatic Hydrocarbons, alcohols, phenols, Ethers, carbonyl! Compound, ketones, carboxylic acids.

UNIT – III Organic Reactions and Applications **08**

Study of following reactions, mechanisms with their applications Aldol, Perkin, Beyer-villiger, Diels-Alder, Knoevenagel, Friedel-craft, Opponager oxidation, Reformatsky reaction.

UNIT– IV Electrochemistry **08**

Introduction, conductance, specific, equipment conductance, variation, molar concentration. Arrhenius theory, transport number and determination, conduct metric titrations, Kohlrausch's law and an application.

Reference book

1. Text book of Inorganic chemistry : Gurudeep Raj & Chatwal
2. Advanced Organic Chemistry : Bhal & Bhal
3. Advanced Organic Chemistry : P.L.Soni
4. Organic Chemistry : Morrison & Boyd.
5. Stereochemistry : P.S.Kalsi
6. Fundamentals of Chemistry : Farooqui, Kuberkar & Wangikar
Renuka Prakashan,
Aurangabad - 431 001.
7. A Text book of chemistry : Kuberkar, Rashmi Publication,
Nanded.

B.Sc. Biochemistry
Second Year Semester – III
Advanced Microbiology
(BCH-302)

Marks-50

Periods: 45

Unit-1

13

Microbial flora of water: Biotic & Abiotic factors affecting number of organism in natural water. Bacteriological examination of water: Sample collection tests, detection of coli forms in water (Presumptive, conformed, completed tests), (SPC standard plate count), membrane filter count, MPN, detection of fecal streptococci & clostridium. Determining sanitary quality of water bacteriological evidence, significance of index organism (*E-coli*, streptococcus facalis). IMVIC test & elevated temperature.

Unit –II

09

Microbiology of Food : Microbial spoilage of food, chemical changes caused by micro-organisms, Principles of Food preservation, control of micro-organisms by use of low & high temperature, dehydration, aseptic handling, pasteurization, lyophilization, radiation pressure for control of micro-organisms.

Unit-III Waste Water Microbiology

13

Definition of sewage, chemical composition of sewage, Measurement of strength of sewage by BOD & COD sewage treatment, disposal, objective, importance of sewage disposal. Methods of sewage Treatment – Single dwelling unit, septic tank, evaporation tank, imhalf tank. Secondary Biological Treatment – Tricking filter, Activated sludge process, oxidation pond, activated sludge digestion. Chemical treatment : Chlorination . Disposal of treated sewage, sludge as fertilizers.

Unit IV Advanced Microbial Techniques

10

Microbial techniques used for isolation of bacteria, Antimicrobial activity by using disc diffusion techniques, Measurement of cell mass by turbid metric method , Widal test for diagnosis test for diagnosis of *S.typhi*, Bioremediation & phytoremediation.

References :

1. Community Nutrition - MC.Laren
2. General Microbiology - R.Y.Stainer
3. General Microbiology Vol.I &II - H.F.Daginawala & Pawar
4. Text book of Microbiology - M.B.Deshmukh, P.S.Wakte & others.

B.Sc. Biochemistry
Second Year Semester – III
Enzymology-I
(BCH-303)

Marks: 50

Periods: 45

Unit-1

Basic concept in enzymology

12

Terms involved in enzymology, Nomenclature of enzymes, classification of enzymes, properties. Coenzyme- Structure and function , TPP, NAD, NADP, FAD, FMN. Enzyme specificity, Mechanism of enzyme action- Lock and key model, induced fit model.

Unit-2

Enzyme Kinetics

12

Importance of kinetics, Concept of steady state and rapid Equilibrium kinetics .Factor affecting enzyme activity, temperature, pH, Concentration, Substrate, Measurements of velocity and its importance. Derivation of Michalies –menton equation, Single and double reciprocal plots. Unit of enzyme activity, Enzyme turnover number.

Unit-3

Mechanism of enzyme action

12

Distribution and localization of enzymes in eukaryotic cell. Mode of enzyme catalysis- covalent, proximate or orientation effect, acid base etc. Chemistry of active center, chemical modification studies by active site directed reagents physical methods for determination of active site conformation. Various theories of mechanism of enzyme action, Structure, function relation of Rib nuclease and chymotrypsin.

Unit-4

09

Method of purification of enzymes

Centrifugation, ammonium precipitation, solvent precipitation.

Reference Books:

1. Biochemistry – Zubey.
2. Biochemistry – Stryer.
3. Principle of Biochemistry- Lehninger.
4. Fundamental of enzymology- price and Stevens

B.Sc. Biochemistry
Second Year Semester – III
Genetics
(BCH-304)

Marks: 50

Periods: 45

Unit I

09

Introduction and History of Genetics, Laws of Mendel (I law, II law, III law), Test cross, Back cross, Chromosomal theory of Inheritance, Dominance, Lethal genes.

Unit II

09

Gene Interaction, chi-square test, Genotype and phenotype, crossing over, factors effecting recombination frequency, multiple alleys, ABO antigen, Pseudoallels.

Unit III

09

Recombination in bacteria (Transformation, Transduction, Conjugation), sex determination in plants, sex determination in animals, Dosage compensation, sex linkage, Epitasis.

Unit IV

09

Mutation: Introduction, characteristics and classification of mutation (Spontaneous & induced mutation), Detection of mutation, Base substitution, addition and deletion, Application of mutation.

Unit V

09

Population genetics: Gene frequency, Genotype frequency, hardy – Weinberg laws and equilibrium, chromosomal aberrations: (Structural, numerical aberrations).

Reference Books :

1. Basic Genetic - Hartle , Freifelds, Seryder.
2. Genetics - Stricberger M.W., Marmillan Publication Inc. (1976)
3. Expending horizons (Introduction to biotechnology by B.D.Singh (Kalyani Punlicatiion)- 2009.
4. Principles of gene manipulation, S.B.Primrose (6th Editioin).
5. Principle of genetics - Gardner, et-al.
6. Genetics – P.K.Gupts, Rastogi Publication Meerut – 2001.

B.Sc. Biochemistry
Second Year Semester – III
Cell Biology
(BCH-305)

Marks: 50

Periods: 45

Unit I

04

Diversity of cell size and shape, structure of eukaryotic cells, prokaryotic.

Unit II

06

Cell cycle – G & S phases, mitosis & meiosis, cell motility – cilia, flagella of Eukaryotes & prokaryotes.

Unit III

08

Cell theory, cellular organelles plasma membrane, cell wall their structural organization, lysosomes, mitochondria, peroxisome.

Unit IV

10

Biosynthesis of proteins in eukaryotic cell, co & post translational modification, intracellular protein trafficking.

Unit V

10

Protein localization: Synthesis of secretory and cytosolic proteins, import of proteins to Nucleus, Chloroplast, peroxisome, receptor mediated endocytosis.

Unit VI

10

Biology of Cancer: Genetic rearrangements in progenitor cells, oncogenes, tumor suppressor genes, metastasis apoptosis.

References :

1. Cell Biology by Givald Karp.
2. Cell Biology, Genetics, Molecular Biology Evolution and Ecology by P.S. Verma, V.K. Agarwal.
3. Cell & Molecular Biology by P.K.Gupta.

B.Sc. Biochemistry
Second Year Semester – III
Human Physiology
(BCH-306)

Marks: 50

Periods: 45

Unit - I Digestive System

08 hrs.

Generalized structure of digestive tract and associated digestive gland. Function of different parts peristalsis, regulation of olive, gastric, pancreatic Intestinal and bile secretion. Absorption – (Carbohydrate, protein, lipid minerals and vitamin) transport and excretion of nutrients.

Unit - II Circulatory System

08 hrs.

Anatomy of heart, Histology of artery, vein and capillary. Blood – composition of blood. Histology of blood cell, blood group. Function of blood. Lymphatic system.

Unit - III Respiratory System

06 hrs.

Structure and function of lung, trachea bronchiole. Mechanism of respiration – role of intercostals muscle, sternum, diaphragm during inhalation and exhalation. Gases exchange CO_2 & O_2 Bohr's effect.

Unit - IV Excretion and Osmoregulation

08 hrs.

Anatomy of kidney. Structure of a typical uriniferous tubule. Mechanism of ultra filtration, Urine formation and acidification of Urine. Counter current mechanism. Haemodialysis. Significance of excretion and osmoregulation

Unit - V Nervous System

08 hrs.

Brain – anatomy and function of different parts of brain. Structure of a typical neuron. Transport and conduction of reflex and reflex arcs. Mechanism of synaptic transmission. Neurotransmitters. Structure and function of neuromuscular functions. Neuro muscular Junction. Acetyl cholinesterase.

Unit - VI Reproductive System

08 hrs.

Make reproductive system and physiological role of testis. Female reproductive system and physiology role of ovary. Spermatogenesis, oogenesis, menstrual cycle ovarian & uterine cycle.

Reference Books :

1. Human physiology Vol.II & I.C.C. Chatterjee.
2. Text book of Medical physiology - Guyton
3. Text book of Human Biochemistry G.P.Talwar
4. Biochemistry – U.Satayanarayana & U.Chakrapani Book.

B.Sc. Biochemistry
Second Year Semester – III
LC-8 Chemistry
(BCH-307)

Marks: 50

Periods: 45

1. Determination of pH of the sample solution by pH meter.
2. Determination of unknown concentration of the sample solution by colorimetric method.
3. Separation of amino acid by thin layer chromatography method.
4. Extraction of caffeine from tea leaves.
5. Demonstration of Flame photometer.
6. Estimation of glycine by iodometric method.
7. Extraction of alkaloids.

B.Sc. Biochemistry
Second Year Semester – III
LC-9 Micro, Genetics and Cell Biology
(BCH-308)

Marks: 50

Periods: 45

1. Sampling , observation & staining of Micro-organisms.
2. Isolation of micro-organisms from soil.
3. Direct viable cell counting.
4. staining for study of bacterial morphology.
5. staining for differentiation of bacteria.
6. Determination of Growth curve of bacteria. (*E-coli* Pseudomonas).
7. Isolation and quantification of DNA from yeast.
8. Isolation and quantification of RNA from yeast.
9. Isolation of plasmid DNA from *E-coli* .
10. Hyper chromic effect of DNA.
11. Isolation of antibiotic resistant mutant of *E-coli*.
12. Effect of U.V. radiation and photo activation.
13. Problems based on Mendel's laws.
14. Study of Mitosis slides.
15. Methods of flagella staining.
16. Isolation of mitochondria from cabbage.
17. Isolation of chloroplast from spinach leaves.
18. Demonstration of cancer

B.Sc. Biochemistry
Second Year Semester – III
LC-10 Enzymology and Human Physiology
(BCH-309)

Marks: 50

Periods: 45

1. Cellular fractionation and study of Marker Enzyme with reference to their localization.
2. Identification and quantitation of activity of α -amylase/invertase/urease.
3. Determination of specific activity of an Enzyme.
4. Determination of Enzyme activity in presence of activators.
5. Determination of activity in presence of inhibitors.
6. Determination of optimum pH.
7. Determination of optimum temperature.
8. Determination of K_m .
9. Study of competitive and non-competitive inhibitors.
10. Demonstration of reversibility of enzyme reaction.
11. Identification of histological specimen – liver, adrenal , pancreas, thyroid , testis and ovary.
12. Preparation and preservation of blood serum and plasma.
13. Preparation of blood smear and DLC (Importance in various disease conditions).
14. Enumeration of RBCs and WBCs for determining health status.
15. Bleeding time and Clotting time.
16. Determination of blood groups (A,B, AB, O and Rh) and it's significance.

B.Sc. Biochemistry
Second Year Semester – IV
Fermentation, Distillery and Beverage
(BCH-401)

Marks- 50

Periods: 45

Unit-1

Fermentation Technology

09

Fermentation technology introduction, Microbial culture selection – use of mutants, recombinant DNA technology, cloning and gene amplification in selection. Equipment and instrumentation- for static, submerged and agitated cultures, sterilization. Scale up-inoculums building.

Unit-2

Measurement and Control of Environment

09

Measurement of volume, mass, weight gas flow temperature, pressure, pH specification. Isolation of fermentation product- removal of solid, primary separation, purification operations, product isolation

Unit-3

Fermentation process kinetics

09

Fermentation rates, final product yields, state of substrate conversion, time factors productivity, average rate of product formation, kinetics of antibiotics fermentation. Analysis of rate pattern and kinetic groups fermentation process types

Unit-4

09

Bioreactors

Batch, semi-batch, CSTF, recycle-CSTF, TFR, Fluidized bed reactors, plug-flow reactors, ideally mixed, non ideally mixed reactors. Reactor analysis- Calculation of flow rate, conversion, volume reactor, processing time, concentration, residual time. Reactor design- overall and differential mass balance, rate of reaction

Cell culture in Ferment or

Bacterial and eukaryotic expression vectors, recombinant proteins, Mammalian cell culture in fermentors. Immobilization techniques-Immobilization of microbial cell and their characteristic

Reference Books:

- General Microbiology : R.Y. Stainer
- General Microbiology vol. I & II : H.F. Daganawala & Powar
- Text book of microbiology : M.B. Deshmukh & P.S. Wakte
- Outline of Microbiology : A.N. Deshmukh
- Practical Microbiology : Dr. R.C.Dubey & Dr.D.K.Maheshwari

B.Sc. Biochemistry
Second Year Semester – IV
Advanced Biotechnology
(BCH-402)

Periods: 45

Unit - I Biotechnology & Health Care **12**

Vaccines: An ideal vaccine, conventional vaccines, DNA vaccine, Recombinant vaccines.
Disease diagnosis: DNA/RNA probes, Monoclonal antibodies. Disease Treatment: Product from non-recombinant organisms, Products from recombinant Gene therapy.

Unit - II Fuel Biotechnology **09**

Biofuel : Introduction, useful features, advantages Biodiesel: Lipids as a source of biodiesel from hydrocarbons. Biogas: The substrate, the digester, The microorganism, process, factors, effecting biogas yields, Advantages &disadvantages.

Unit - III Biocontrol Agents **09**

Bioinsecticides, Bioherbicide, Bioweedicide, Disease control, Advantages limitation, Golden rice, Bio plastic.

Unit – IV Recovery of Metals **08**

Desulphurization of coals, Merits of using microbes for ore leaching, Limitation of microbial ore leaching, application of microbial leaching, Bioaggregation.

Unit – V Intellectual Property Rights **08**

Introduction, Protection of intellectual property rights, Trade secrets, patent copyrights, and Good laboratory practices (GLP) plant variety protection.

Reference Books :

Genes III - Lewin B, Oxford University Press, New York (2000)
Satyanarayana (2006), Textbook of Biotechnology, U.Satynarayana.
Biotechnology – Expanding Horizons, B.D. Sign.
Basic Biotechnology – P.K.Gupta, Rastogi Publication, Meerut (2001).

B.Sc. Biochemistry
Second Year Semester – IV
Enzymology-II
(BCH-403)

Marks- 50

Periods: 45

Unit-1

Enzyme Inhibition

12

Enzyme inhibitor types, kinetics of enzyme inhibition, role of coenzyme in metabolism. Role of metals in enzyme kinetics. Activator kinetics, Bi substrate kinetics, Kinetic for reversible enzyme catalyzed reaction, Haldane relation ship'

Unit-2

Biological control

12

Multienzyme complexes and their significance in metabolic control. Membrane bound enzymes in metabolic control. Compartmentalization of enzymes and substrate, the shuttle systems.

Unit-3

Enzyme regulation

12

Allosterism, nature of allosteric enzymes and sigmoid kinetics, mode of action, allosteric , regulation. Product inhibition, feed back control, enzyme induction and repression. Mode of hormonal action on enzymes. Concept of receptors, agonist and antagonists.

Unit-4

09

Enzyme Technology

Industrial uses of enzymes- Food and pharmaceutical industries. Clinical enzymology- serum enzymes in health and diseases.

Immobilised enzyme technology-

designer enzymes-Abzymes .Biosensor- Ribozymes

Reference Books:

1. Biochemistry – Zubby.
2. Biochemistry – Stryer.
3. Principle of Biochemistry- Lehninger.
4. Fundamental of enzymology- price and Stevens

B.Sc. Biochemistry
Second Year Semester – IV
Nutritional Biochemistry
(BCH-404)

Marks- 50

Periods: 45

Unit - I Energy Metabolism

08

Energy value of food (Protein, carbohydrate, fats, & protein). BMR and factor affecting BMR Disease caused by mal nutrition's (Protein, mineral & vitamins)

Unit - II

08

Nutritional aspect of carbohydrate lipid and protein and fiber. Disease related to digestion & absorption of food. Minerals major and minor minerals physiological and biochemical function assay.

Unit - III Protein Nutrition

06

Protein food Nutritional significances of protein from milk, legumes, egg, meat & fish. Protein efficiency ratio, biological value and digestibility coefficient.

Unit - IV Lipid Nutrition

10

Composition, source of fat & oil function utilization, required daily allowances, excess & deficiency. Role of cholesterol & arteriosclerosis. Obesity – definition, complications prevention & treatment.

Unit - IV Water & Mineral Metabolism

10

Significance of water in metabolism. Dehydration & oedema. Source & significance of calcium & phosphate metabolism. Iodine metabolism. Significance, preservation of physiological PH & union and cation balance. Acid – base balance in body fluids.

References :

1. Nutrition and dietetics - Shubhangi Joshi
2. Principles of nutrition - E.D.Wilson
3. Handbook of food nutrition - M.Swaminathan
4. Applied nutrition - R.Rajlaxmi

B.Sc. Biochemistry
Second Year Semester – IV
Molecular Biology-I
(BCH-405)

Marks- 50

Periods: 45

Unit - I	09
Evidences for DNA as genetic material, Experimental proof, Identification of DNA as a genetic material . Defination of gene, organization of genes & satellite DNA cot value.	
Unit - II	09
DNA replication in prokaryotes, mode of replication (conservative semiconservative & dispersive). Mechanism of DNA replication: Locus, RNA primer, okazki fragment. Enzymes & factors involved in replication.	
Unit - III	09
RNA polymerase, sigma factor Initiation, Elongation & termination of transcription Post transcriptional modification (Poly A tail, S' cap)	
Unit - IV	09
Steps involved in translation – Initiation, elongation & termination. Post translation modification.	
Unit - V	09
Repair of DNA, types of damages, Excision repair, and recombination. SOS repair & photo reactivation. Regulation of gene action – concept of operon, regulation of genes (lac operon)	

B.Sc. Biochemistry
Second Year Semester – IV
Membrane Biochemistry
(BCH-406)

Marks- 50

Periods: 45

Unit-1

Biomembrane

10

Defination, Physicochemical properties of biological membrane, Structure and Composition, Singer and Nicolson's model. Bacterial cell envelope, asymmetry flip flop, protein lipid interaction Biological and physical models, energetics and transduction phenomena, Biochemical Chemiosmotic hypothesis of Mitchell

Unit-II

Membrane Transport

15

Laws of diffusion across membrane, Simple diffusion, facilitated diffusion and active transport, transport role of proteins in the process, exocytosis, receptor mediated endocytosis, osmoregulation. Na, H dependent processes and phosphotransferase synthesis. Specialised mechanism for transport of macromolecule, gap junction, Nuclear pores, toxin Control of transport process, binding proteins, hormone effects and the role of lipids Role of Na, K, ATPase and passive permeability of the plasma membrane to Na, K and Cl, Voltage and ligand gated ion channels, ATP-ADP exchanger.

Unit-III

Nerve Transmission

10

Structure of neuron, axon, dendrites, Synapse neuromuscular junction . Neuro transmitters mechanisms of nerve conduction, adrenergic neuron and muscarinic neurons, GABA, NMDA. Structure and function of acetyl choline receptor

Unit-IV

Molecular Mechanism

10

Ion translocating antibiotics, valinomycin, gramicidin, ouabain, group translocation, ionophores, electrical gradient , energy coupling mechanism, assembly of virus membrane receptor

Unit-V

Penetrating the defenses

10

How antimicrobial agents reach their targets, cellular permeability barrier to drug penetration, some examples of modes of penetration of antimicrobial agents, the exploitation of transport systems in the design of new antimicrobial agents.

Reference Books:

1. Membrane and their cellular function By IB Filnean, R.Coleman and RH Michell, 1994, Blackwell publication.
2. Biochemistry – Zubby.
3. Biochemistry – Stryer.
4. Principle of Biochemistry- Lehninger.

B.Sc. Biochemistry
Second Year Semester – IV
LC-11 Fermentation, Distillery & Beverage
(BCH-407)

Marks- 50

Periods: 45

1. Isolation of microorganism from soil demonstrating synthesis capability of desired product, Gram staining and Screening
2. Optimization of the lab scale production of the desired product : Effect of temperature, pH, Substrate concentration
3. Growth Curve: Estimation of cell number, substrate utilization and/ or product formation
4. Production of citric acid by aspergillus niger and estimation of citric acid by titration method
5. Production of alcohol by yeast
6. To immobilize yeast cells by gel entrapment method
7. Production of alcohol by starch
8. Quantitative estimation of alcohol produced.
9. To detect alcohol production by idoform test.

B.Sc. Biochemistry
Second Year Semester – IV
LC-12 Biotechnology/ Molecular Biology
(BCH-408)

Marks- 50

Periods: 45

1. Isolation of DNA from Bacteria and Blood.
2. Assessment of purity of DNA by 260/280 ratio.
3. Restriction digestion of DNA
4. Ligation of DNA
5. Separation of DNA fragments by Electrophoresis.
6. Southern Blotting & Northern Blotting.

B.Sc. Biochemistry
Second Year Semester – IV
LC-13 Enzymology/ Nutritional Biochemistry
(BCH-409)

Marks- 50

Periods: 45

1. Milk analysis – total solids, lactose estimation by Lane – Eynon volumetric method (specific gravity by lactometer).
2. Detection of Adulterants in food.
Detection of probable adulteration in the following :
 - A) Oil – groundnut
 - B) Spices – Black pepper
 - C) Clinnamomum – chilly powder.
 - D) Cerals – Bajara
 - E) Beverages – Tea and coffee
 - F) Pulses – Gram dal flour
 - G) Food products mango pulp.
3. Qualitative test for the detection of adulteration in milk and milk products.
4. Determination of activity in Curd / Paneer / Milk, - by titration method.
5. Isolation of Albumin from egg white by ammonium sulphate precipitation.
6. Isolation of cholesterol and lecithin from egg yolk by Fractionation method.
7. Extraction of oil in oil content in oil seed by colorimetric method.
8. Extraction of oil in oil seed by Soxhlet method.
9. Assay of lipase activity.
10. Extraction of urease from jack bean / horse gram.
11. Extraction of pectinase.
12. Assay of urease inhibitor.