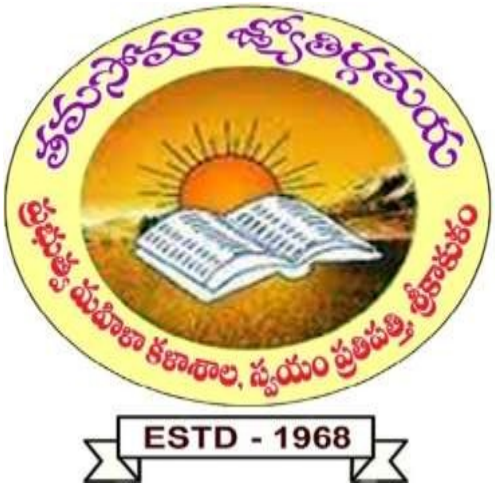
GOVERNMENT COLLEGE FOR WOMEN (AUTONOMOUS)
SRIKAKULAM

DEPARTMENT OF BIO-CHEMISTRY



BOARD OF STUDIES

BIO-CHEMISTRY SYLLABUS

2023-24

Major Domain Subject: BIOCHEMISTRY
SEMESTER-III

Course: Enzymology, Bioenergetics and IntermediaryMetabolism

Code:BCH-III

60 HRS

(5 periods/week)

Unit-I:Enzymology 12hours

Introduction to Biocatalysis, differences between chemical and biological catalysis. Nomenclature and classification of enzymes. Definition of holo-enzyme, apo-enzyme, coenzyme, cofactor. Active site, Enzyme specificity. Principles of energy of activation, transition state. Interaction between enzyme and substrate-lock and key, induced fit models. Fundamentals of enzyme assay, enzyme units. Outlines of mechanism of enzyme action, factors affecting enzyme activity. Commercial application ofenzymes.

Unit- II: Bioenergetics andBiologicaloxidation 12 hours

Bioenergetics: Thermodynamic principles – Chemical equilibria; free energy, enthalpy (H), entropy (S). Free energy change in biological transformations in living systems; High energy compounds. Energy, change, oxidation-reductionreactions.

Organization of electron carriers and enzymes in mitochondria. Classes of electron-transferring enzymes, inhibiters of electron transport.

Oxidative phosphorylation. Uncouplers and inhibitors of oxidative phosphorylation. Mechanism of oxidative phosphorylation.

Unit-III:CarbohydrateMetabolism. 12 hours

Concept of anabolism and catabolism. Glycolytic pathway, energy yield. Fate of pyruvate-formation of lactate and ethanol, Citric acid cycle, regulation, energy yield, amphipathic role. Anaplerotic reactions. Glycogenolysis and glycogenesis. Pentose phosphate pathway. Gluconeogenesis. Photosytnthesis- Light and Dark reactions, Calvin cycle, C4 Pathway. Disorders of carbohydrate metabolism- Diabetes Mellitus. Anapleroticequations.

Unit-IV:Lipid Metabolism **12 hours**

Catabolism of fatty acids, β oxidation, with odd and even number of carbon atoms. Ketogenesis, De Novo synthesis of fatty acids in mitochondria and microsomes. Biosynthesis and degradation of

Biosynthesis and degradation of triacylglycerol and lecithin. Biosynthesis of cholesterol. Disorders of lipid metabolism.

Unit-V: Metabolism ofAmino acids **12 hours**

General reactions of amino acid metabolism - transamination, decarboxylation and deamination, Urea cycle and its regulation, Catabolism of carbon skeleton of amino acids-glycogenic and ketogenic amino acids. Metabolism of glycine, serine, aspartic acid, methionine, phenylalanine and leucine. Biosynthesis of creatine. Inborn errors of aromatic and branched chain amino acidmetabolism.

Practical – BCP-301: Quantitative analysis

1. **Assay ofamylase.**
2. **Assay ofurease.**
3. **Assay ofcatalase**
4. **Effect of pH, temperature and substrate concentration on enzymeactivity.**
5. **Estimation of glucose by DNSmethod.**
6. **Estimation of glucose by Benedict's titrimetricmethod.**
7. **Estimation of total carbohydrates by Anthronemethod.**
8. **Tests for lipids- Salkowski test, Lieberman-Burchardtest.**
9. **Estimation of amino acid by Ninhydrinmethod.**
10. **Estimation of protein by Biuretmethod.**

Recommended books:

1. Understanding enzymes: Palmer T., Ellis Harwood ltd.,2001.
2. Enzyme structure and mechanism. Alan Fersht, Freeman & Co.1997
3. Principles of enzymology for food sciences: Whitaker Marc Dekker1972.
4. Principles of Biochemistry, White. A, Handler, P andSmith.
5. Biochemistry, LehningerA.L.
6. Biochemistry, LubertStryer.
7. Review of physiological chemistry, Harold A.Harper.
8. Text of Biochemistry, West andTodd.
9. Metabolic pathways –Greenberg.
10. Mitochondria,Munn.
11. Biochemistry, 2nd Edition, G.Zubay.
12. Biochemistry-Vol 1,2,3, and 4 published by TeluguAcademy.

Expected out comes of course BCH-IV

1. Thestudentwillgetknowledgeinthedifferentphysiologicalsystemsandtheir functionsinthehumanbody.Bystudyingblood,itscompositionanditsfunctions thestudentwillunderstandtheimportanceofblood.
2. Thiscoursewillalsoprovideknowledgeinhormones,theirfunctionsandthe diseasesoccurringduetoalterationsinthelevelsofhormones.
3. Bystudyingthiscoursethestudentwillknowthenutritionalimportanceof proteins,carbohydrates,lipids,vitaminsandminerals.
4. Clinicalbiochemistryunitalongwithpracticalswillenablethestudenttodo diagnostictestsforliverdiseases,Gastrointestinaldiseases,renaldiseasesand nutititionaldeficiencies.

Major Domain Subject: BIO-CHEMISTRY

SEMESTER-IV

Course: Physiology, Nutritional and Clinical

Biochemistry Code:BCH-1V

60 HRS

(5 periods/week)

Unit-I: Digestion and Blood 12hours

Digestion and absorption of carbohydrates, lipids and proteins. Role of enzymes and gastrointestinal hormones in digestion. Composition of blood, Blood groups, coagulation of blood and disorders of blood coagulation (haemophilia). Hemoglobin and transport of gases in blood (oxygen and CO_2). Types of anemias, haemoglobinopathies-sickle cellanemia.

Unit-II: Nervous system and excretory system 12hours

Introduction to nervous system, general organization of nervous system, Neurons-structure, types, properties and functions; Neurotransmitters, Cerebrospinal fluid-composition and functions, Reflex-types and properties.

Introduction to excretory system. Organisation of kidney, Structure and functions of nephron, Urine formation, Role of kidneys in maintaining acid-base and electrolyte balance in the body.

UnitIII:Endocrinology 12 hours

Endocrinology- organization of endocrine system. Classification of hormones. Outlines of chemistry, physiological role and disorders of hormones of thyroid, parathyroid, pituitary and hypothalamus. Introduction of gastrointestinal hormones. Mechanism of hormonal action- signal transduction pathways for glucocorticoids and insulin. Adrenalin, estrogen and progesterone.

Unit-IV: Nutritional Biochemistry 12hours

Balanced diet. Calorific values of foods and their determination by bomb calorimeter. BMR and factors affecting it. Specific dynamic action of foods. Energy requirements and recommended dietary allowance (RDA) for children, adults, pregnant and lactating women. Sources of complete and incomplete proteins. Biological value of proteins. Malnutrition-Kwashiorkar, Marasmus and PEM.

Vitamins- sources, structure, biochemical roles, deficiency disorders of water and fat soluble vitamins. Introduction to neutraceutical and functional foods. Bulk and trace elements-Ca, Mg, Fe, I, Cu, Mo, Zn, Se andF.

Unit- V: Clinical

12h

Biochemistry ours

Plasma proteins in health and disease. Liver diseases-jaundice. Liver function tests- conjugated and total bilurubin in serum, albumin: globulin ratio, Serum enzymes in liver diseases-SGOT, SGPT, GGT,CPK, Acid and alkaline phosphatases. Serum lipids and lipoproteins. Normal and abnormal constituents of urine. Renal function tests-Blood urea, creatinine, GFR, creatinine clearance. GTT and gastric and pancreatic function tests. Auto blood analyser and cell counter.

Practical – BCH-401: Nutritional and Clinical Biochemistry

45HRS **(3periods/week)**

List of Experiments:

1. Estimation of calcium bytitrimetry
2. Estimation of iron by Wong'smethod.
3. Estimation of vitamin C by 2, 6 -dichlorophenol indophenolmethod.
4. Determination of iodine value of anoil.
5. Estimation of hemoglobin inblood.
6. Total count - RBC and WBC. Differentialcount.
7. Determination of blood group and Rhtyping.
8. Visualization of antigen antibody reactions (Ouchterlonytechnique).
9. Urine analysis for albumin, sugars and ketonebodies.
10. Estimation of urinarycreatinine.

11. Estimation of bloodGlucose.
12. Estimation of serum totalcholesterol.

Recommended books:

1. Essentials of Food and Nutrition, Vol. I & II, M.S.Swaminathan.
2. Text Book of Biochemistry with clinical correlations. Thomas M.Devlin (JohnWily).
3. Harper's Review of Biochemistry, Murray et al(Longman).
4. Biochemical aspects of human disease – R.S. Elkeles and A.S. Tavil. (Blackwell ScientificPublications).
5. Clinical chemistry in diagnosis and treatment–Joan F.Zilva and P.R.Pannall (Lloyd-Luke Medical Books,1988).
6. Varley's Practical clinical Biochemistry – Ed. Alan W. Gowenlock (Heinemann Medical Books, London,1988).
7. Clinical diagnosis and management by Lab methods (John BernardHenry, W.B. Salunders Company, 1984).
8. Clinical Biochemistry – S.Ramakrishnan andRajiswami.
9. Chemical Biochemistry (Metabolic and clinical aspects) by W.J.Marshall&S.K.Bangert.
10. Text book of clinical Biochemistry by Tietz et al.
11. Biochemistry-Vol 1,2,3, and 4 published by TeluguAcademy.

Expected outcomes of the course BCH-V

1. Thiscoursewill enable the student to know various microbes such as bacteria,fungiandviruses,theirstructuresandotherpropertiesanddiseases caused by them. The student will also get knowledge in their commercial applicationsbymakinguseoftheirbeneficialeffectssuchasfermentationin alcoholproduction,nitrogenfixationinagriculture**etc.**
2. The student will also get knowledge in immune system, vaccines andalsounderstand the pathogenesis of auto immune diseases and immune deficiency diseases.
3. Thiscoursewillprovideknowledgeandexpertiseinmolecularbiologysuchas genes,theirstructureandimportance.Thiswillalsoenablethestudenttoknow theapplicationsofPCRincloninganddiagnosisofgeneticandviraldiseases.
4. Thepracticalswillprovidetheexpertisetothestudenttoworkinmicrobiology laboratory,foodandpharmaindustries,andbiotechcompaniesforproductionof vaccinesandotherlifesavingdrugs.

Major Domain Subject: BIO-CHEMISTRY

Semester - IV

Course: Microbiology,Immunology and Molecular biology

Code:BCH-V

60 HRS

(5 periods/week)

Unit-I:Microbiology 12hours

Introduction to microbiology and microbial diversity. Classification of microorganisms- prokaryotic and eukaryotic microorganisms.Bacterial structure, growth curve and kinetics of growth. Introduction to viruses-plant and animal viruses, structure, life cycle, Food and dairy microbiology. Corona virus causing Covid – 19.

Unit-II:NitrogenFixation 12hours

Nitrogen cycle, Non-biological and biological nitrogen fixation, photosynthetic and non-photosynthetic systems, Nitrogenase system. Utilization of nitrate ion, Ammonia incorporation into organic compounds. Synthesis of glutamine and regulatory mechanism of glutamine synthase.

Unit-III:AppliedBiochemistry 12hours

Fermentation Technology: Batch, continuous culture techniques, principle types of fermentors. Pasteur effect.Industrial production of chemicals-alcohol,acids

(citric acid), solvents (acetone), antibiotics (penicillin), Enzyme Technology: Immobilization of enzymes and cells, industrial applications, enzymes in Bioremediation.

Unit-IV:Immunology 12hours

Organs and cells of immune system. Innate and acquired immunity, Cell mediated and humoral immunity (T-cells and B-cells). Classification of immunoglobulins,structureof IgG. Epitopes / antigenic determinants. Concept of haptens. Adjuvants. Monoclonal antibodies.Antigen-antibody reactions- agglutination, immunoprecipitation, immunodiffusion. Blood groupantigens. Immunodiagnostics- ELISA. Vaccines and their classification. Traditional vaccines- liveand attenuated. Modern vaccines- recombinant and peptide vaccines. Outlines ofhypersensitivityreactions.

Unit- V:Molecular biology 12hours

Types of RNA and DNA, DNA replication-leading and lagging strands, okazaki fragments, inhibitors of DNA replication. Genetic code, Protein synthesis- transcription, translation, inhibitors of protein synthesis. Outlines of cloning technology, vectors, restriction enzymes, PCR,applications of cloning in agriculture, industry and medicalfields.

Practical – BCP-501: Microbialogyandimmunology **45HRS**

(3 periods/week)

List of Practical Experiments

1. Biosafety and good laboratory practices (GLP) ofMicrobiology.
2. Sterilization of microbial media byautoclave.
3. Isolation ofpurecultures: (i) Streak platemethod.(ii) Serial dilution method.
4. Demonstration of alcoholfermentation.
5. Antibiotic sensitivity by paper discmethod.
6. Effect of nitrogen sources on growth of E.coli
7. Immunodiffusion by Ouchterlonymethod.
8. Blood groupanalysis.
9. Isolation of DNA from planttissues.
10. Spotters.

Recommended books:

1. Willey MJ, Sherwood, LM &Woolverton C J (2013) Prescott, Harley and Klein's
Microbiology by. 9th Ed., McGrawHill.
2. Atlas RM. (1997). Principles of Microbiology. 2nd edition. WM.T.Brown Publishers.
3. Pelczar MJ, Chan ECS and Krieg NR. (1993). Microbiology. 5th edition. McGraw
Hill Book Company.
4. Fermentation Technology (2nd ed.) Standury (Pergmanpress)
5. Biotechnology: Textbook of Industrial microbiology 2nd Edit. By Crueger and
Crueger (2000).

6. Principles of Biochemistry, White. A, Handler, P andSmith.

7. Goldsby RA, Kindt TJ, Osborne BA. (2007). Kuby's Immunology. 6th edition W.H. Freeman and Company, New York.

8. Richard C and Geiffrey S. (2009). Immunology. 6th edition. Wiley Blackwell Publication.

9. Watson JD, Baker TA, Bell SP, Gann A, Levine M and Losick R (2008) Molecular
Biology of the Gene, 6th edition, Cold Spring Harbour Lab. Press, Pearson Publication.

10. Molecular biology by David Freifelder

B.Sc	Semester–V(SkillEnhancementCourse-Elective)	Credits:4
Course:6B	LaboratoryTechniquesandDiagnostics	Hrs/Wk:4

Learningoutcomes:

Studentsaftersuccessfulcompletionof thecoursewillbeableto

1. UnderstanddifferenttypesofdiagnosticLaboratoryTechniques
2. Identifyvariousfacilitiesrequiredtosetupadiagnosticlabs.
3. Understandexpertiserelatedtovariouspracticesindiagnosticlabs.
4. Acquireskillstogetanemploymentortobecomeanentrepreneur.

Syllabus:(Total90hrs.(IncludingTeaching,Lab,FieldTrainingandunit testsetc.)UNIT– I:BasicMedicalLaboratory Principlesand Procedures:(10h)

Code of conduct for laboratory personnel – safety measures in the laboratory,chemical/reagentslabeling, storageand usage.
FirstAidinlaboratoryaccidents–Precautionsandfirstaidequipment's.
Sterilization,preparationofreagents.
Generalapproachtoqualitycontrol,qualitycontrolofquantitativedata.
Reportinglaboratorytestsandkeepingrecords.

UNIT-II:Laboratoryequipment's:(10h)

Principle, Procedure & Applications of microscope – light microscope, Phase contrast,Fluorescence,Electron microscope.
Centrifuge-principle,typesandapplications
Colorimeter-Usageandcare.
serologicalwaterbathandincubator,hot-airoven

UNIT-III:UrineAnalysis:(10h)

Composition-abnormalandnormalconstituents ofurine
Collectionandpreservationofurine
Physicalexamination
Chemicalexamination[abnormalandnormalconstituentsofurine]
Microscopicexaminationof theurinarysediment.
Microbial cultureofurine

UNIT-IV:StoolExamination:(10h)

Specimencollection-inspectionoffaeces-odour,pH
Interferingsubstance.
Testforoccultblood,fecalfat
Microscopicexaminationofstoolspecimen.

UNIT-V:ClinicalHematology:(10h)

Collectionofblood-Anticoagulants,preservation
Hemoglobinestimationby Sahli'smethod
RBCcount,Packedcellvolume[PCV]
Erythrocytesedimentationrate[ESR]
Totalanddifferentialcountof WBC,Plateletcount
Bloodgrouping,ABOsystem,RhSystem,

SUGGESTEDREFERENCES:

- Park,K.(2007),PreventiveandSocialMedicine,B.B.Publishers
- GodkarP.B.andGodkarD.P.TextbookofMedical LaboratoryTechnology,IIEdition,BhalaniPublishingHouse
- CheesbroughM.,A

- RobbinsandCortan,PathologicBasisofDisease,VIIIEdition.
- Prakash,G.(2012),LabManualonBloodAnalysisandMedicalDiagnostics,S.ChandandCo.Ltd.
- MedicallaboratorytechnologybyMukaraje

B.Sc	Semester–V(SkillEnhancementCourse-Elective)	Credits:1
Course:6B	LaboratoryTechniques and DiagnosticsLab	Hrs/Wk:2

Skilloutcomes:

Onsuccessfulcompletion ofthepracticalcourse, studentshallbeableto

1. Listoutdifferenttypes ofBloodCells.
2. IdentifytheLaboratorytools
3. DevelopskillonCollectionandanalysis ofurine
4. DevelopskillonCollectionandanalysisoffecalsample

Practicalsyllabus:

1. HemoglobinestimationbyShale'smethod
2. RBCcount
3. ESR
4. TotalanddifferentialWBCcount
5. Bloodgrouping[ABOsystem&RhSystem]
6. Collectionofurineandfecalsamples
7. Fecalanalysistodetectfats,undigestedfoodand blood
8. Qualitativeanalysisofurinefornormalandpathologicalconditions.

SUGGESTEDREFERENCESFORPRACTICALS:

1. PracticalclinicalBiochemistry-HaroldVarley,CBS,NewDelhi
2. MedicalLaboratoryTechnology–
KanaiL.Mukherjee,TataMcGrawHillPublicationandco.ltd.,Vol, I,II,III
3. Clinicalchemistry–RanjanaChawla
4. laboratoryManualinBiochemistry–Jayaraman
5. Biochemicalmethods–S.SadasivanAndManickam
6. Introductiontopracticalbiochemistry–DavidT.Plummer.

Co-curricularactivities:

a) Mandatory:(Trainingofstudents byteacheronfield relatedskills:15hrs)

1) Forteachers:Trainingofstudents byteacherinlaboratoryand fieldforatotalof15hrsondivisionsin diagnosticcenterandinfrastructureofdiagnosticcenter.

2) Forstudents;Visittolocaldiagnosticcenters,observingthevarious analysisdoing inlab.Submissionoffield workreport of10pagesintheprescribed format.

3) Maximummarksforfieldworkreport:05

4) Suggestedformatforfieldworkreport:Titlepage,studentdetails,contentpage,introduction,workd one, findings,conclusionand acknowledgements.

5) Unittest(IE)

b) Suggestedco-curricularactivities:

1. Visittodiagnosticcenters
2. Learningtechniquesofbasictoolsandinstrumentshandlingrelatedtofieldwork
3. ObservetheSamplecollection,processingandpreservation
4. Trainingofstudents byrelatedsubjectexperts
5. Attendingspeciallectures,groupdiscussions andseminarsonrelatedtopics

MODELQUESTIONPAPER

SemesterV

(SkillEnhancementCourse-Elective)

PAPER-6B:LaboratoryTechniquesandDiagnostics

(w.e.f.2022-23)

Time:3hours **Max.Marks:75**

SECTION-A [5X5=25M]

SECTION-B [5X10=50M]

(Answerallthequestions.Eachquestioncarries10 marks)

1. WriteanessayonLaboratorysafetyandhygiene.
2. Writeindetailednoteonsterilizationand preparationofreagents.
3. Writeanessayonworkingprincipleof Electron microscope.
4. Writetheworkingprincipleandinstrumentationof Laboratorycentrifuge.
5. Writeadetailednoteoncollectionandpreservation ofurine.
6. Writeanessayon microbial cultureofurine.
7. Writeanessayonspecimencollectionandinspectionoffaeces.
8. Writeanessayon microscopicexaminationofstoolspecimen.
9. HowdoyouestimateHaemoglobinpercentagebySahli'smethod.
10. Writean essayontotalanddifferentialcountofWBC.

SECTION -B

(Answeranyfivequestions.Eachquestioncarries 5marks)

11. Firstaidandprecautions.
12. Qualitycontrol.
13. Incubator.
14. Normalandabnormalconstituentsofurine.
15. Physicalexaminationofurine.
16. Testforfecalfat.
17. ESR.
18. ABOsystem.

SuggestedQuestionPaperModelForPracticalExamination

Semester–V/BiochemistryCourse–6A(SkillEnhancementCourse)

BCP-6B:LABORATORYTECHNIQUESANDDIAGNOSTICS

Max.Time:3 Hrs. Max. Marks:50

1. EstimatetheamountofHemoglobinbyShale'smethod 20 M
2. Write theprinciple,procedureforBloodgrouping10M
3. Writetheprinciple/procedureforfollowingPracticals5 M
   a) ESRb)TotalcountofRBC
4. ScientificIdentificationofspotters 5 x1 =5 M

A. Centrifuge
B. Colorimeter
C. lightmicroscope
D. Neubauerchamber
E. RBCPipette

5. Record+Viva-voce 5+5 =10M

B.Sc	Semester–V(SkillEnhancementCourse-Elective)	Credits:4
Course:7B	BloodBanking&ClinicalScience	Hrs/Wk:4

Learningoutcomes:

Studentsaftersuccessfulcompletionof thecoursewillbeableto

1. Understanddifferenttypesofproceduresin BloodBank.
2. Identify various facilities required to set up a Blood Bank.Andclinicallab.
3. Understoodexpertiserelatedtovariouspracticesina BloodBank.Andclinicallab.
4. Acquireskillstogetanemploymentortobecomeanentrepreneur.

Syllabus: (Total 90 hrs. (Including Teaching, Lab, Field Training and unit tests etc.)

UNIT-I: BloodBanking

Bloodgrouping-ABOsystem,Rhtyping.
Coomb'stest.
Bloodtransfusion-Blooddonors,donorscreening,drawingofblood
Compatibilitytesting,crossmatching,
Bloodtransfusioncomplications.

UNIT-II:CSFand OtherBodyFluids

CompositionofCerebrospinalfluid&CSFanalysis
Compositionofsemen
Semenanalysis
sputumexamination
pregnancytests -Interpretation.

UNIT-III:EndocrineFunctionTestsanddiabetestests

thyroidhormonesand itsfunction,andClinicaldisorders
Thyroidfunctiontest- T3andT4,TSH,131IUptake.
cortisolandprolactintest
testosteroneandestrogentest
typesofdiabetes
Glucosetolerancetest,Glycatedhemoglobin

UNIT-IV:MedicalParasitology

Amoebiasis-lifecycleofcausativeorganism,pathogenesisanddiagnosis
Malaria–lifecycle,pathogenesisanddiagnosis
Acuteandchronicfilariasis–diagnosis.
Helminthiasis-lifecycle,pathogenesisanddiagnosis

UNIT-VMedicalMicrobiology

Safetyprocedureinmicrobiologicaltechniques.
Cultureoforganisms fromvariousspecimens.
Culturemedia
Antibioticsensitivitytests(pus,urine,stool,sputum, throatswab]
Gramstaining,Ziehl–Neilsonstaining(TB, Leprabacilli).

B.Sc	Semester–V(SkillEnhancementCourse-Elective)	Credits:1
Course:7B	BloodBanking&ClinicalScience Lab	Hrs/Wk:2

Skilloutcomes:

Onsuccessfulcompletion ofthepracticalcourse, studentshallbeableto

3. DevelopskillonCollectionAndAnalysisOfUrine
4. DevelopskillonCollectionAndAnalysis Offecalsample

Practicalsyllabus:

1. Bloodgrouping
2. RHTyping
3. Coomb'stest.
4. Cerebrospinalfluidanalysis
5. Semenanalysis
6. pregnancytest
7. Thyroidfunctiontest- T3and T4,TSH
8. Glucosetolerancetest
9. EstimationOfGlycatedhemoglobin
10. ObservethepermanentSlides;malarialparasites,Amoebiasis
11. Gramstaining, Ziehl–Neilsonstaining[demonstration]

SUGGESTEDREFERENCES:

1. PracticalclinicalBiochemistry-HaroldVarley,CBS,NewDelhi
2. MedicalLaboratoryTechnology–KanaiL.Mukherjee, TataMcGrawHillPublicationandco.ltd.,Vol, I,II,III
3. ClinicalChemistry– RanjanaChawla
4. LaboratoryManualinBiochemistry–Jayaraman
5. Biochemicalmethods–S.SadasivanAndManickam
6. IntroductiontoPracticalbiochemistry–DavidT.Plummer.

Co-curricularactivities:

a) Mandatory:(Trainingofstudents byteacheronfield relatedskills:15hrs)

1. Forteachers:Trainingofstudents byteacherinlaboratoryand fieldforatotalof15hrsondivisionsindiagnosticcenterand infrastructureofdiagnosticcenter.
2. Forstudents;Visittolocaldiagnosticcenters ,observingthevariousanalysisdoinginlab.Submissionof fieldworkreportof10pagesintheprescribedformat.
3. Maximummarksforfieldworkreport:05
4. Suggestedformatforfieldworkreport:Titlepage,studentdetails,contentpage,introduction,workd one, findings,conclusionand acknowledgements.
5. Unittest(IE)

b) Suggestedco-curricularactivities:

1. Visittodiagnosticcenters
2. Learningtechniquesofbasictoolsandinstrumentshandlingrelatedtofieldwork
3. ObservetheSamplecollection,processingandpreservation
4. Trainingofstudents byrelatedsubjectexperts
5. Attendingspeciallectures,groupdiscussions andseminarsonrelatedtopics

MODELQUESTIONPAPER

SemesterV

(SkillEnhancementCourse-Elective)

PAPER-7B:Blood Banking&ClinicalScience

(w.e.f.2022-23)

Time:3hours **Max.Marks:75**

SECTION-A [5X5=25M]

SECTION-B [5X10=50M]

AnswerAllthequestions.Eachquestioncarries10marks.

1. WriteanessayonABObloodgrouping.
2. Writeindetailed noteonbloodtransfusion.
3. Writean essayon compositionofCSFandanalysis.
4. Writeadetailed noteon pregnancytestandinterpretation.
5. Writeanessayonthyroidhormonesandits clinicaldisorders
6. Writeadetailednoteontestosterone andestrogentest
7. Writean essayon malarialparasites
8. WriteanessayonHelminthiasis
9. Writean essayonvarious culturemedia.
10. Writeadetailednoteonantibioticsensitivitytests.

SECTION- B

Answeranyfivequestions.Eachquestioncarries5marks.

11. Coomb'stest.
12. Crossmatching.
13. Compositionofsemen.
14. Semenanalysis.
15. Typesofdiabetes.
16. GTT.
17. Amoebiasis.
18. Gram'sstaining.

1. Medical Laboratory Technology - K. Mukherjee. Vol. I, II, III. Tata McGraw-Hill PublishingCompanyLtd.
2.MedicalLaboratoryTechnology–V.H.Talib
3. ClinicalLaboratorypracticesinCMCprocedure,CMC,Vellore.
4 MedicalLabTechnology-RamnikSood

SuggestedQuestionPaperModelForPractical Examination

Semester–V/BiochemistryCourse–
6A(SkillEnhancementCourse)

BCP-7B:BLOODBANKING&CLINICALSCIENCE

Max.Time:3Hrs. Max. Marks:50

1. EstimatetheamountofGlycatedhemoglobinpresentingivenblood sample20M
2. Writetheprinciple,procedureforBloodgrouping 10M
3. Writetheprinciple/procedureforfollowingPracticals 5 M
a)Coomb'stest.b)GTT
4. ScientificIdentificationofspotters 5 x1 =5 M
   A. Centrifuge
   B. Coomb'stest.
   C. GTT
   D. Neubauerchamber
   E. RBCPipette

5. Record+Viva-voce 5+5 =10M

QUESTION BANK
DEPT. OF BIOCHEMISTRY

UNIT – I

I. Biophysical concept

1. Write the Biological Buffer
2. Oxygen Electrodes
3. PKA Valuey
4. To Write the Soil Analysis
5. Biological Solvent of Water

UNIT – II Carbohydrates

1. D and L Designation
2. Amino Sugars
3. Epimary&Anomary&Mutarotarions
4. BaltirialCell wall of Polysacharides .
5. Classification of Carbohydrates
6. Disaccharides
7. Storage Polysaccharides
8. Glycosamine glycols

UNIT –III LIPIDS

1. Properties of fats & Oils
2. General Properties ofPhaspholipids
3. Prostaglandins structure& Properties
4. Fluid Musaic Models
5. Types & functions of Lipoproteins
6. Bio membranes.

UNIT- IV Amino acids and Proteins

1. Classifications of Amino acids
2. Titration curve of Glycine
3. Peptide bond formation
4. Naturally accuring peptides.
5. Classification of Properties
6. Essential and non essential amino
7. Chemical reactions of Amionoacids
8. Structural organization of property.

UNIT –V Nucleicacids and Properties

1. Structure of RNA
2. Structure ofPurins and Pyrimidins
3. Formation of Phyphodi ester linkage
4. Wason crick double hellial
5. Tim values & Significance
6. Structure of Heme
7. Structure of Chlorophyle
8. Structure of Cytochrome

B.Sc. Choice Based Credit System (CBCS)
Subject:B I O C H E M I S T R Y
Model Question Paper (Theory)
Paper: V

Time: 3 Hrs **Max. Marks: 75**

SECTION - A

Answer ANY FIVE questions

Each question carries 10 marks 5 x 10M = 50 Marks

(Select two questions in each unit)

1. a) UNIT-I
   OR
   b) UNIT-I

2. a) UNIT-II
   OR
   b) UNIT-II

3. a) UNIT-III
   OR
   b) UNIT-III

4. a) UNIT-IV
   OR
   b) UNIT-IV

5. a) UNIT-V
   OR
   b) UNIT-V

SECTION - B

Answer ANY FIVE questions

Each question carries 5 marks 5 x 5 = 25 M

6. UNIT-I
7. UNIT-I
8. UNIT-II
9. UNIT-II
10. UNIT-III
11. UNIT-III
12. UNIT-IV
13. UNIT-IV
14. UNIT-V
15. UNIT-V

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B.Sc. Choice Based Credit System (CBCS)
Subject:B I O C H E M I S T R Y
Model Question Paper (Theory)
Paper: III/IV

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

SECTION - A

Answer ANY FIVE questions

Each question carries 10 marks 5 x 8M = 40 Marks

(Select two questions in each unit)

1. a) UNIT-I
   OR
   b) UNIT-I

2. a) UNIT-II
   OR
   b) UNIT-II

3. a) UNIT-III
   OR
   b) UNIT-III

4. a) UNIT-IV
   OR
   b) UNIT-IV

5. a) UNIT-V
   OR
   b) UNIT-V

SECTION - B

Answer ANY FIVE questions

Each question carries 5 marks 5 x 4 = 20 M

6. UNIT-I
7. UNIT-I
8. UNIT-II
9. UNIT-II
10. UNIT-III
11. UNIT-III
12. UNIT-IV
13. UNIT-IV
14. UNIT-V
15. UNIT-V

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