

HINDI MAHAVIDYALAYA
(AUTONOMOUS & NAAC RE-ACCREDITED)
(Affiliated to Osmania University)
Nallakunta, Hyderabad



B.Sc. III YEAR
SEMESTER V&VI
DEPARTMENT OF BIOCHEMISTRY
(2022-2023)

HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD (AUTONOMOUS)

COMPOSITION OF THE BOARD OF STUDIES IN AN AUTONOMOUS COLLEGE

I. Composition: Department of Biochemistry

1. Head of the Department concerned (Chairman)
G. Lahari, Head-Department of Biochemistry
 2. The entire faculty of each specialization
 1. G. Lahari
 3. One expert to be nominated by the Vice Chancellor from a panel of six recommended by the College Principal
 1. Dr. B. Manjula, Chairperson, BOS, Dept. of Biochemistry, Osmania University, Hyderabad.
 4. Experts on the subject from outside the college to be nominated by the Academic Council.
 1. Dr. Sai Padma, Head and Assistant professor, Department of Biochemistry Bhavan's Vivekananda college, Hyderabad.
 2. Mrs K. Sumana Yadagiri, Assistant professor & Government City College, Nayapul, Hyderabad.
 5. One postgraduate meritorious alumnus to be nominated by the Principal. The Chairman, Board of Studies, may with the approval of the Principal of the College.
 1. MEGHAMSH TEJA – MSc BIOCHEMISTRY – qualified CSIR JRF
 2. L. SAI VAISHNAVI- MSc BIOHEMISTRY.
- (a) Experts from outside the College whenever special courses of studies are to be formulated. -To be nominated.
- (b) Other members of staff of the same faculty.
Mrs. G. Ranganayaki

HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)
DEPARTMENT OF BIOCHEMISTRY
AGENDA OF THE MEETING

- 1 Welcome address by the chair.
- 2 Previous Meeting Details.
- 3 Details of choice based credit system.
- 4 Discussion and Distribution of Common Core Syllabus for all the Semesters (V and VI)
- 5 Marks allotted for internal and end semester exams.
- 6 Discussion on Pattern and model paper of Semester Exam and internal exam for all the Semesters (V and VI)
- 7 Discussion on Practical exam model paper for all the Semesters (V and VI)
- 8 Panel of Examiners
- 9 Any other matter
- 10 Vote of thanks

**HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)**

**DEPARTMENT OF BIOCHEMISTRY
BOARD OF STUDIES**

Academic Year – 2022-2023

Minutes of BOS Meeting

BOS meeting of the Department of Biochemistry was held on

The following members were present

Dr. B. Manjula	-	University Nominee	
G. Lahari	-	Chair person	Head, Dept. of Biochemistry & Nutrition Bhavanrao Madhokananda College, Sainikpuri, Secunderabad-500094.
Dr. Sai Padma	-	Member of BOS	LECTURER IN BIOCHEMISTRY P/c Biochemistry Department Govt. City College Hyderabad.
Mrs.k.Sumana Yadagiri	-	Member of BOS	

1 Welcome address by the chair

The chair welcomed the University Nominee, Chairperson BOS, O.U. Department of Biochemistry and Members of B.O.S.

2 Previous Meeting details

The CBCS system has been introduced by Osmania University from 2016-17. The theory and practical syllabus of I, II & III years of B.Sc., question paper pattern for theory and practical, internal assessment pattern, practical examination scheme and panel of examiners were discussed and approved by all the BOS Members in previous BOS meeting.

3 Details of choice based credit system.

Members were informed that TSCHE has referred that from the academic year 2016-17 autonomous institutions have to follow CBCS i.e. From the Academic Year 2016-17 Osmania University has instructed all the Degree colleges including Autonomous Degree colleges to follow CBCS under which after passing the exam student will get the Grade in the Final Result.

4. Discussion and Distribution of Common Core Syllabus for semesters V and VI.

- i. Members were informed by the chair that Department of Biochemistry, Hindi Mahavidyalaya is following common core syllabus prescribed by Osmania University with few changes for B.Sc. III YEAR in V and VI semesters.
- ii. The syllabus comprise of 4 units.
- iii. Syllabus copy for both the semesters is enclosed.
- iv. Syllabus was approved by the Members of BOS.
- v. Change In practical syllabus in paper 5 semester V

1. SGOT, SGPT (Kit Method)

2. estimation of iron from apple juice by phenanthroline method

5. Marks allotted for Internal and end Semester exams.

1. Internal assessment is of 30 marks in which 20 marks are for online/offline test, where students have to answer 20 MCQs in 25 minutes. Each question carries 1 mark. In each Semester two online/offline tests of 20 Marks will be conducted and an average of both the tests will be added in the marks of theory exam.
2. Theory Question paper is of 70 marks.
3. Total allotted marks are 70 for each theory paper.
4. Internal assessment is of 15 marks for SEC. One online/offline internal assessment of 15 Marks will be conducted and added in the marks of Theory exam.
5. Theory Question paper for SEC is of 35 marks.
6. Total allotted marks are 50 for each SEC

The distribution of marks was approved by the Members of BOS.

6 Discussion on Pattern and Model Paper of Semester exam and Model Paper of Internal Exam

1. It was informed by the department that in each Semester Two Online//offline tests will be conducted for DSC of 20 marks. The continuous internal assessment will have three sections.
Section – A 20 multiple choice questions each carries 1 mark ($20 \times 1 = 20M$),
Section – B Assignment – 5 Marks
Section – C Seminar – 5 Marks
Average of marks of these two online /offline tests will be taken.
2. It was informed by the department that in each Semester one Online/offline test will be conducted for SEC of 15 marks. The internal assessment will have
15 Multiple choice questions each carries 1 mark ($15 \times 1 = 15M$),
3. Semester exam will be conducted as per the Almanac which will be provided by the exam branch. Internal exam duration will be 25 Min and Semester exam duration will be of 2 1/2 hrs.
4. Model Question paper for Semester V and Semester VI was discussed. Theory paper for each Semester will have 2 sections.
 - i) Section A contains 8 short Questions. The student has to answer six questions.
Each Question carries 3 Marks ($6 \times 3 = 18$ Marks)
 - ii) Section B contains 4 Essay type Questions with internal choice. Each Question carries 13 Marks ($4 \times 13 = 52$ Marks)
6. Model Question paper of SEC for Semester III and Semester IV was discussed. Theory paper for each SEC will have 2 sections.
 - i) Section A contains 4 short Questions. The student has to answer THREE questions.
Each Question carries 5 Marks ($3 \times 5 = 15$ Marks)
 - ii) Section B contains 2 Essay type Questions with internal choice. Each Question carries 10 Marks ($2 \times 10 = 20$ Marks)
7. Model Question paper of GE for Semester V was discussed. Theory paper for each SEC will have 2 sections.
 - i) Section A contains 8 short Questions. The student has to answer six questions.
Each Question carries 3 Marks ($6 \times 3 = 18$ Marks)
 - ii) Section B contains 4 Essay type Questions with internal choice. Each Question carries 13 Marks ($4 \times 13 = 52$ Marks)

7. **Discussion on Practical Exam Model paper.**

- It is decided that the practical examinations held for B.Sc third year (Semester V&VI) will have the pattern of 25 marks scheme and the credits will remain the same i.e. 1 credit. The duration of the exam will be 3 hours.
- Pattern of Model Practical Question Papers for Paper V and Paper VI are enclosed.
- Pattern of Model Practical Question Papers was approved by Members of BOS

8 **Panel of Examiners**

The panel of examiners was approved by the members.

- List is enclosed

9. **Any other matter.**

10. **Vote of Thanks**

Meeting concluded with the Vote of Thanks by G. Lahari.

Chairperson

G. Lahari

University Nominee

G. Lahari
CHAIRMAN

Board of Studies in Biochemistry
Osmania University,
HYDERABAD-500 007.

Members

G. Lahari
Head, Dept. of Biochemistry & Nutrition
Bhavan's Vivekananda College,
Srinikpuri, Secunderabad-500094.

K. S. Srinivas
LECTURER IN BIOCHEMISTRY
7c Biochemistry Department
Govt. City College
Hyderabad.

G. Lahari
PRINCIPAL
HINDI MAHA VIDYALAYA
(AUTONOMOUS)
Arts, Commerce & Science
Hallakunta, Hyderabad.

(AUTONOMOUS)
Affiliated to Osmania University, Nallakunta, Hyderabad-44
CBCS STRUCTURE FOR 2022-2023 BATCH
DEPARTMENT OF BIOCHEMISTRY

THIRD YEAR SEMESTER - V					Semester End Exam		Continuous Internal Evaluation		Total	Practical hours
Code	Course Title	Course Type	HPW	Credits	Duration in Hours	Marks	Exam Duration	Marks		
BS501	English	CC-1E	4	4	1 1/2	35	20 min.	15	50	
BS502	Second language	CC-2E	3	3	2 1/2	70	30 min.	30	100	
BS503	PHYSIOLOGY & BIOCHEMISTRY	GE	4	4	2 1/2	70	30 min.	30	100	
BS504	PHYSIOLOGY , NUTRITION AND CLINICAL BIOCHEMISTRY	DSC-1E	4T+3P=7	4+1=5	2 1/2	70	30 min	30	100	25
BS505	Microbiology V	DSC-2E	4T+3P=7	4+1=5	2 1/2	70	30 min	30	100	25
BS506	Chemistry-V	DSC-3E	4T+3P=7	4+1=5	2 1/2	70	30 min	30	100	25
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CHAIRMAN Head, Dept. of Biochemistry & Nutrition, Commerce & Science
Board of Studies in Biochemistry, Osmania University, Hyderabad-500 007.
Sainikpuri, Secunderabad-500094.

LECTURER IN BIOCHEMISTRY
2nd B.Sc. Biochemistry Department
Govt. City College
Hyderabad.

HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD (AUTONOMOUS)

B.Sc. III Year Semester – V
GENERAL ELECTIVE (GE)

Biochemistry Paper – BIOCHEMISTRY AND PHYSIOLOGY

Code BS501

Instruction

Theory Classes

Practical Classes

Credit for Theory

Credit for Practical

Duration of Semester Examination

Duration of Internal Examination

Semester Examination Marks

Internal Marks

4 Hrs/Week

2Hrs/Week

4

1

2 ½ hours

25 minutes

70 Marks

30 Marks

Unit Name	TOPICS	HOURS PER UNIT
1. Biomolecules	<ol style="list-style-type: none"> 1. Water properties, pH and buffer. 2. Carbohydrates- Classification (mono, di, oligo and poly), Properties and importance. 3. Amino acids- Classification, Properties and importance. Structure of Proteins. 4. Lipids- Classification, Properties and importance. 5. Nucleic acids- Purines, Pyrimidines, Nucleosides, Nucleotides. Structure and types of DNA and RNA and denaturation. 6. Enzymes- Classification, Factors effecting enzyme activity, clinically important enzymes (SGOT, SGPT, LDH and CPK). 7. Vitamins (Fat soluble and Water soluble) and Trace elements. 	15 hours
2. Metabolism	<ol style="list-style-type: none"> 1. Amino acid Metabolism- General reactions, metabolism of aromatic amino acids. 2. Carbohydrate Metabolism- Glycolysis and TCA cycle. 3. Gluconeogenesis and Glycogen metabolism.. 4. Lipid metabolism- β-oxidation of fatty acids. 5. De novo synthesis of fatty acids. 6. Nucleic acid metabolism- Synthesis and degradation of Purines and Pyrimidines. 7. Metabolic disorders. 	15 hours
3. Physiology	<ol style="list-style-type: none"> 1. Physiology of digestion. 2. Physiology of Vision. 3. Physiology of Muscle. 4. Physiology of Nerve and mechanism of nerve impulse transmission. 5. Composition of blood and blood coagulation. 6. Structure of heart and cardiac cycle. 7. Factors controlling blood pressure. 	15 hours

4. Endocrinology	<ol style="list-style-type: none"> 1. Introduction to Endocrinology and Organization of endocrine system. 2. Hormones of Hypothalamus. 3. Hormones of Pituitary 4. Hormones of Thyroid and Clinical Relevance. 5. Hormones of Pancreas and Clinical Relevance. 6. Hormones of Adrenal gland. 7. Hormones of Gonads. 	15 hours
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Chairperson

Jahani

University Nominee

[Signature]

CHAIRMAN

Board of Studies in Biochemistry
Osmania University,
HYDERABAD-500 007.

Members

Head, Dept. of Biochemistry & Nutrition
Bhavan's Vivekananda College,
Sainikpuri, Secunderabad-500034.

Principal

[Signature]
PRINCIPAL
HINDI MAHA VIDYALAYA
(AUTONOMOUS)
Arts, Commerce & Science
Muntha, Hyderabad

LECTURER IN BIOCHEMISTRY
7c Biochemistry Department
Govt. City College
Hyderabad.

HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)

B.Sc. III Year Semester – V

OPTIONAL - A

**BIOCHEMISTRY PAPER V – PHYSIOLOGY, NUTRITION AND CLINICAL
BIOCHEMISTRY**

Code: BS504

INSTRUCTION

Theory Classes

Practical Classes

Credit for Theory

Credit for Practical

Duration of Semester Examination

Duration of Internal Examination

Semester Examination Marks

Internal Marks

DSC –IE

4 Hrs/Week

2 Hrs/Week

4

1

2 ½ hours

25 minutes

70 Marks

30 Marks

Unit Name	TOPICS	HOURS PER UNIT
1. Physiology	<ol style="list-style-type: none">1. Digestion and Absorption of carbohydrates, lipids and proteins.2. Composition of blood and coagulation of blood.3. Hemoglobin and transport of gases in blood (oxygen and Co₂).4. Heart- Structure of heart, Cardiac cycle, Cardiac factors controlling blood pressure.5. Physiology of Vision.6. Muscle-Kinds of muscles, structure of myofibril, organization of contractile protein and mechanism of muscle contraction.7. Structure of Neuron and propagation of nerve impulse.	15 hours
2. Endocrinology	<ol style="list-style-type: none">1. Endocrinology-organization of endocrine system. Classification of hormones.2. Mechanism of hormonal action-steroid and peptide hormones such as adrenaline, glucocorticoids and insulin3. Chemistry, physiological role and disorders of hormones of Pituitary Hypothalamus and Thyroid.4. Chemistry, physiological role and disorders of hormones of Pancreas.5. Chemistry, physiological role and disorders of hormones of Parathyroid.6. Chemistry, physiological role and disorders of hormones of Gonads, Placenta and Adrenals.7. Gastrointestinal hormones and their physiological role.	15 hours

3. Nutrition	<ol style="list-style-type: none"> 1. Balanced diet. Calorific values of foods and their determinants by bomb calorimeter. 2. BMR and factors affecting BMR. Specific dynamic action of foods. 3. Energy requirements and recommended dietary allowance (RDA) for children, adults, pregnant and lactating women. 4. Sources of complete and incomplete proteins. Biological value of proteins. Role of essential fatty acids in human nutrition. 5. Malnutrition- kwashiorkor, Marasmus and PEM. 6. Vitamins-sources, structure, biochemical roles, deficiency disorders of water and fat soluble vitamins; Bulk and trace elements- Ca, Mg, Fe, I, Cu, Mo, Zn, Se and F. 7. Nutraceuticals; Obesity and starvation. 	15 hours
4. Clinical Biochemistry and Organ Function Tests.	<ol style="list-style-type: none"> 1. Structure and functions of heart, liver, Liver function tests- conjugated and total bilirubin in serum, albumin: globulin ratio, Hippuric acid and bromosulphthalein tests. Serum enzymes in liver diseases- SGPT, GGT and Alkaline phosphates. 2. Kidneys-structure of nephron and mechanism of urine formation, Normal and Abnormal constituents of urine.. 3. Biological buffers. Role of Kidneys in maintaining acid-base and electrolyte balance in the body. 4. Renal function tests-creatinine and urea clearance tests, phenol test. 5. Biochemical tests for the diagnosis of heart diseases- HDL/LDL. Cholesterol, SGOT, LDH, Ck. C-reactive protein, cardiac troponins. 6. Brain function tests- EEG. 7. GI tract test- Endoscopy. 	15 hours

Chairperson

University Nominee

Members

Principal

HINDI MAHA VIDYALAYA
(AUTONOMOUS)

Jahan

Board of Studies in Biochemistry
Osmania University,
HYDERABAD-500 007.

Head, Dept. of Biochemistry & Arts, Commerce & Science
Bhavan's Vivekananda College,
Sainikpuri, Secunderabad-500094.

2. K. Suman
LECTURER IN BIOCHEMISTRY
/c Biochemistry Department
Govt. City College
Hyderabad.

**HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)**

B.Sc. III Year Semester – V

Biochemistry Practical Paper V

PHYSIOLOGY, NUTRITION AND CLINICAL BIOCHEMISTRY

PRACTICALS

1. Estimation of hemoglobin in blood, Total count and Differential count – RBC and WBC.
2. Urine analysis for albumin, Sugars and Ketone Bodies.
3. Estimation of urinary creatinine.
4. Estimation of vitamin- C by 2, 6 – DCPIP method
5. Determination of peroxide value of oil.
6. SGOT , SGPT (Kit Method)
7. Estimation of Iron content in Apple juice by phenanthroline method

REFERENCES FOR PRACTICALS:

1. Experimental Biochemistry – A student companion-Beedu Sashidhar Rao and Vijay Deshpande.
2. Laboratory Manual in Biochemistry-Jayaraman, J.Wiley Eastern.
3. Biochemical Methods-Sadasivam, S. and Manickyam, A. New Age International Publishers.

Chairperson

University Nominee

CHAIRMAN

Board of Studies in Biochemistry
Osmania University,
HYDERABAD-500 007.

Members

Head, Dept. of Biochemistry & Nutrition
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Sainikpuri, Secunderabad-500094

PRINCIPAL
HINDI MAHA VIDYALAYA
Principal (AUTONOMOUS)
Arts, Commerce & Science
Nallakunta, Hyderabad-44.

2. *K. Suman*

LECTURER IN BIOCHEMISTRY
i/c Biochemistry Department
Govt. City College
Hyderabad.

HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)

B.Sc. III Year Semester – V

OPTIONAL – B

BIOCHEMISTRY PAPER V – CELL BIOLOGY, GENETICS AND MICROBIOLOGY

Code: BS504

INSTRUCTION

Theory Classes

Practical Classes

Credit for Theory

Credit for Practical

Duration of Semester Examination

Duration of Internal Examination

Semester Examination Marks

Internal Marks

DSC –IE

4 Hrs/Week

2 Hrs/Week

4

1

2 ½ hours

25 minutes

70 Marks


30 Marks

Unit Name	TOPICS	HOURS PER UNIT
1.Cell Biology	<ol style="list-style-type: none"> 1. Cell as basic unit of living organisms: Ultra-structure of prokaryotic cell and eukaryotic cell. 2. Composition & functions of cell organelles. 3. Cytoskeleton-microfilaments, microtubules, intermediate filaments. 4. Chromosome organization in prokaryotes and eukaryotes and structure of chromosomes (Polytene and Lamp Brush). 5. Cell cycle. 6. Mitosis and Meiosis. 7. Cell death – Apoptosis and Necrosis. 	15 hours
2. Genetics	<ol style="list-style-type: none"> 1. Basic concepts of Genetics - Mendel's law. 2. Non-mendelian inheritance: Extra Chromosomal inheritance (paramecium & Drosophila). 3. Partial or incomplete dominance and Co-dominance.. 4. Maternal inheritance (Coiling in Snails, Leber's hereditary optic neuropathy (LHON)). 5. Polygenic inheritance (Introduction to quantitative traits). 6. Sex linked X-linked recessive inheritance (Color blindness & Hemophilia). Concept of autosomal recessive and dominant inheritance. 7. Linkage and recombination. 	15 hours
3.Mutation and Mutagens	<ol style="list-style-type: none"> 1. Mutations (Spontaneous/induced, somatic/germinal. Forward/reverse, transition/transversions). 2. Mutations (Silent, Misense, Nonsense, and frame shift mutations, conditional, leaky). 3. Detection, selection & isolation of microbial mutants.. 	15hours

	4. Estimation of mutation rates. 5. Reversion and suppression of mutations. 6. Mutagens – physical, chemical. 7. Transposon mutagenesis, site-directed mutagenesis.	
4. Microbiology	1. Introduction of brief history of microbiology, Classification of microorganisms, Mycoplasma. 2. Motility and sporulation. 3. Isolation and cultivation of bacteria. Selective media and enriched media. Gram's staining. 4. Bacterial growth curve and kinetics of growth. Batch, continuous and synchronous cultures. 5. Industrial uses of <i>Aspergillus niger</i> , Yeast and <i>Spirulina</i> . 6. Structure and composition of viruses. One step growth and determinant of plaque forming units (PFU). 7. Viral life cycle – T4 (Lytic), λ phage (lytic and Lysogenic), TMV, Retro viruses, HIV.	15 hours

Chairperson


Lahari


University Nominee
CHAIRMAN
Board of Studies in Biochemistry
Osmania University,
HYDERABAD-500 007.

Members

Head, Dept. of Biochemistry & Nutrition
Bhavan's Vivekananda College,
Sainikpuri, Secunderabad-500094.

Principal


PRINCIPAL
HINDI MAHA VIDYALA
(AUTONOMOUS)
Arts, Commerce & Science
Nallakunta, Hyderabad-

2. *K. Sumane*

LECTURER IN BIOCHEMISTRY
w/c Biochemistry Department
Govt. City College
Hyderabad.

HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)
B.Sc. III Year Semester – V
Biochemistry Practical Paper V
BIOCHEMISTRY PAPER V – CELL BIOLOGY, GENETICS AND MICROBIOLOGY

PRACTICALS

1. Preparation of different stages of mitosis and meiosis.
2. Problems on Monohybrid cross, Problems on dihybrid ratio in *Drosophila*/Maize, Linkage and Recombination, Sex-linked inheritance and X-linked recessive inheritance.
3. Sterilization methods and preparations of culture media, Isolation of pure cultures: (i) Streak plate method (ii) Serial dilution method.
4. Gram Staining.
5. Motility of bacteria by hanging drop method.
6. Bacterial growth curve.
7. Antibiotic sensitivity by paper disc method.

REFERENCES FOR PRACTICALS:

1. Essential practical handbook of Cell Biology & genetics, Biometry and Microbiology: A Laboratory Manual by Debarati Das, Academic Publishers.
2. Microbiology – A laboratory manual by Cappuccino and Sherman, Pearson Publications LPE.
3. Experiments in Microbiology, Plant Pathology and Biotechnology by Aneja A.R., new Age Publications.

Chairperson

lahari

[Signature]
University Nominee
CHAIRMAN
Board of Studies in Biochemistry
Osmania University,
HYDERABAD-500007.

Members

Head, Dept. of Biochemistry & Nutrition
Bhavan's Vivekananda College,
Sainikpuri, Secunderabad-500094.

Principal

[Signature]
PRINCIPAL
HINDI MAHA VIDYALAYA
(AUTONOMOUS)
Arts, Commerce & Science
Nallakunta, Hyderabad

2. *[Signature]*
LECTURER IN BIOCHEMISTRY
/c Biochemistry Department
Govt. City College
Hyderabad.

HINDI MAHAVIDYALAYA

(AUTONOMOUS)

Affiliated to Osmania University, Nallakunta, Hyderabad-44
CBCS STRUCTURE FOR 2022-2023 BATCH
DEPARTMENT OF BIOCHEMISTRY

B.Sc- BIOCHEMISTRY, MICROBIOLOGY, CHEMISTRY - ACADEMIC YEAR 2022-2023

THIRD YEAR SEMESTER - VI					Semester End Exam		Continuous Internal Evaluation		Total	Practical 3 hours
Code	Course Title	Course Type	HPW	Credits	Duration in Hours	Marks	Exam Duration	Marks		
BS601	BIOCHEMISTRY IN HEALTH & DISEASES	CC-IF	4	4	1 1/2	35	20 min.	15	50	
BS602	English	CC-2F	3	3	2 1/2	70	30 min.	30	100	
BS603	Second Language	CC-2E	3	3	2 1/2	70	30 min.	30	100	
BS604	MOLECULAR BIOLOGY & IMMUNOLOGY	DSC-1F	4T+3P=7	4+1=5	2 1/2	70	30 min	30	100	25
BS605	Microbiology VI	DSC-2F	4T+3P=7	4+1=5	2 1/2	70	30 min	30	100	25
BS606	Chemistry-VI	DSC-3F	4T+3P=7	4+1=5	2 1/2	70	30 min	30	100	25
									PRINCIPAL	

Chairperson

Lahari

University Nominee

CHAIRMAN
Board of Studies in Biochemistry
Osmania University
HYDERABAD-500 007

Members

Head, Dept. of Biochemistry & Nutrition
Bhavan's V. V. Lakshmi College,
Sainikpuri, Secunderabad-500094.

Principal

HINDI MAHA VIDYALAYA
(AUTONOMOUS)

Arts, Commerce & Science
Nallakunta, Hyderabad

2. *K. Suman*

LECTURER IN BIOCHEMISTRY
i/c Biochemistry Department
Govt. City College
Hyderabad

HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD

(AUTONOMOUS)

B.Sc. III Year Semester – VI

OPTIONAL – A

BIOCHEMISTRY PAPER VI – MOLECULAR BIOLOGY AND IMMUNOLOGY

Code: BS603

INSTRUCTION

Theory Classes

Practical Classes

Credit for Theory

Credit for Practical

Duration of Semester Examination

Duration of Internal Examination

Semester Examination Marks

Internal Marks

DSE–IF

4 Hrs/Week

2 Hrs/Week

4

1

2 ½ hours

25 minutes

70 Marks

30 Marks

Unit Name	TOPICS	HOURS PER UNIT
1. DNA Replication.	<ol style="list-style-type: none"> 1. Experimental evidences to prove DNA as genetic materials 2. Nature and structure of the gene. 3. DNA replication – models of replication, Meselson-Stahl's experimental proof for semi-conservative replication. 4. Replication in prokaryotes – DNA polymerases I, II, III of Ecoli, Helicase, Topoisomerases, Primase, Ligase. 5. Bidirectional replication model. Okazaki fragments, Leading and lagging strands of DNA synthesis. 6. Replication in eukaryotes. 7. Inhibitors of DNA replication. 	15 hours
2. Transcription and Translation	<ol style="list-style-type: none"> 1. Transcription – RNA synthesis, RNA polymerases of prokaryotes and eukaryotes. 2. Initiation, Elongation and Termination-rho dependent and rho independent. 3. Post-transcription modifications and inhibitors of RNA synthesis. 4. Genetic code, Deciphering of genetic code, Nirenberg's and Khorana's experiments. Wobble hypothesis, degeneracy of genetic code. 5. Protein synthesis-structure of t-RNA activation of amino acids (aminoacyl t-RNA synthetases). Ribosome structure. 6. Initiation, Elongation and Termination of protein synthesis. Post-translational modifications and inhibitors of protein synthesis. 7. Regulation of prokaryotic gene expression- induction and 	15 hours

	repression .Lac operon.	
3. Immunology	1. Organization of immune system. 2. Organs and cells of immune system. 3. Innate and acquired immunity. 4. Cell mediated and humoral immunity 5. Classification of immunoglobulin, structure of igG. Theories of antibody formation – clonal selection theory. 6. Epitopes/antigenic determinants. Concepts of haptens. Adjuvants. 7. Monoclonal antibodies and their applications.	15 hours
4. Immunotechnology	1. Antigen-antibody reactions – agglutination, immunoprecipitation, immunodiffusion. 2. Blood group antigens. 3. Immunodiagnostic – RIA, ELISA. 4. Vaccines and their classification, Traditional vaccines. 5. Modern vaccines – recombinant and peptide vaccine. 6. Outlines of hypersensitivity reactions. 7. Fundamentals of graft rejections and MHC proteins.	15 hours

Chairperson

Jahan

University Nominating

CHAIRMAN
 Board of Studies in Biochemistry
 Osmania University,
 HYDERABAD-500 007.

Members

Head, Dept. of Biochemistry & Nutrition
Bhavan's Vivekananda College,
 Sainikpuri, Secunderabad-500094.

PRINCIPAL
HINDI MATH VIDYALAYA
(AUTONOMOUS)
 Arts, Commerce & Science
 Mahakunta, Hyderabad-44

2.

K. Suresh
LECTURER IN BIOCHEMISTRY
 /c Biochemistry Department
 Govt. City College
 Hyderabad.

HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)

B.Sc. III Year Semester – VI

OPTIONAL – B

BIOCHEMISTRY PAPER VI – r-DNA TECHNOLOGY AND BIOTECHNOLOGY

Code: BS603

INSTRUCTION

Theory Classes

Practical Classes

Credit for Theory

Credit for Practical

Duration of Semester Examination

Duration of Internal Examination

Semester Examination Marks

Internal Marks

DSE-IF

4 Hrs/Week

2 Hrs/Week

4

1

2 ½ hours

25 minutes

70 Marks

30 Marks

Unit Name	TOPICS	HOURS PER UNIT
1.r- DNA technology I.	1. Cloning strategies 2.Tools of r-DNA technology: Enzymes- restriction endonucleases and ligases 3. Restriction mapping 4. Polymerase chain reaction –Principle and application 5. Outlines of blotting techniques –Southern, Northern and Western 6. Molecular markers-RFLP,FLP,RAPD 7. DNA sequencing – Maxam Gilbert and Sanger's method	
2.r- DNA technology II.	1.Construction of c-DNA libraries 2. Cloning vectors –plasmids,cosmids,λ phages 3. Hosts –E.coli 4. Application of gene cloning- production of insulin 5. Production of human growth hormone 6. Production of Bt cotton 7. Edible vaccines	15 hours
3. Plant and Animal Biotechnology	1. Plant tissue culture and its applications 2. plant as bioreactor and valuable chemical factories (production of bioactive compounds) 3. Transgenic plants ,Crop improvement, Production of herbicide and insect resistant plants 4. Genetically modified, crops –Arabidopsis, Golden rice,	15 hours

	soybeans, Bt cotton, tobacco, potato, papaya, jatropha 5. Animal cell culture and its applications. 6. Animal cells as bioreactors, Molecular pharming; Production of vaccines, pharmaceutical proteins, recombinant hemoglobin and blood substitutes 7. Transgenic animals	
4. Microbial and Environmental Biotechnology	1. Microbes as biocontrol agents, Microbial insecticides (Baculoviruses, Bacillus thuringiensis and Bacillus sphaericus) 2. Bioremediation, Biodegradation of cellulose and lignocelluloses, bio-surfactants and bio-emulsifiers 3. Microbial ore leaching and production of microbial fuels (hydrogen, methane) 4. Renewable and Non-renewable energy sources 5. Strategies involved in Municipal solid waste treatment, treatment of industrial and domestic effluent (aerobic and anaerobic) 6. Biomaterials as an alternative to non-degradable materials. Heavy Metal Accumulation, Biosorption 7. Heavy metal tolerance (including mechanism) and its impact on environment	15 hours

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Arts, Commerce & Science
Nallakunta, Hyderabad.

Principal

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K. Suman
LECTURER IN BIOCHEMISTRY
/c Biochemistry Department
Govt. City College
Hyderabad.

**HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)**

B.Sc. III Year Semester – VI

Biochemistry Practical Paper VI

BIOCHEMISTRY PAPER VI – MOLECULAR BIOLOGY AND IMMUNOLOGY

PRACTICALS

1. Isolation of DNA from onion/plasmids
2. Determination of purity of nucleic acids by UV- spectrophotometer method
3. Estimation of DNA by diphenylamine method
4. Estimation of RNA by orcinol method
5. Electrophoresis of nucleic acids and visualization by ethidium bromide staining
6. Agglutination: A,B, AB and O blood groups and Rh
7. ODD and Sandwich ELISA

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Chaitanya
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**HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)**

B.Sc. III Year Semester – VI

Biochemistry Practical Paper VI

BIOCHEMISTRY PAPER VI B : r-DNA technology and Biotechnology

PRACTICALS

1. Restriction mapping: λ –DNA with any two restriction enzymes; strategies of Gene cloning
2. Preparation and transformation of competent cells
3. Preparation of MS medium and initiation of callus, Micro propagation of plants
4. Isolation of microbes from environment (Any sources: soil, water, skin, bread, milk)
5. Efficacy testing for bio-fertilizers (nodulation test for rhizobia) and Efficacy testing for bio-pesticides
6. Microbial degradation of organic matter, Municipal solid waste treatment and waste water treatment
7. Production of hydrogen and methane

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HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD

(AUTONOMOUS)

B.Sc. III Year Semester – VI

OPTIONAL PAPER

BIOCHEMISTRY PAPER – BIOCHEMISTRY IN HEALTH AND DISEASE

Code: BS606

INSTRUCTION

Theory Classes

Practical Classes

Credit for Theory

Credit for Practical

Duration of Semester Examination

Duration of Internal Examination

Semester Examination Marks

Internal Marks

4 Hrs/Week

2 Hrs/Week

4

1

2 ½ hours

25 minutes

70 Marks

30 Marks

Unit Name	TOPICS	HOURS PER UNIT
1. Metabolic disorders	1. amino acid metabolism 2. Phenylketonuria ,Alkaptonuria 3. Carbohydrate Metabolism 4. Galactosemia, Pentosuria 5. Nucleic acid metabolism 6. Gout ,Lesh-Nyhan syndrome 7. Lipid Metabolism 8. Gaucher's disease, Tay –sachs disease	15 hours
2. Genetic disorders	1. Introduction to genetic disease 2. Chromosomal disorders- Down syndrome ,Turner syndrome 3. Hemoglobinopathies- Sickle cell anaemia 4. Thalassemia 5. Genetic counselling 6. Pre-natal diagnosis 7. Gene therapy	15 hours
3. Endocrine disorders	1. Introduction to endocrine disorders 2. Endocrine organs a) pituitary gland b) Thyroid gland c) Parathyroid gland d) Pancreas e) Ovaries, Testes f) Adrenal glands 3. Diabetes- Type I & II 4. Thyroidism 5. Polycystic Ovaries	15 hours

	6. Endometriosis 7. Contraceptives 8. Addison's and Cushing syndrome	
4. Molecular Basis of cancer	1. Chemical Carcinogens 2. Fundamental features of carcinogenesis 3. Oncogenes, Tumor suppressor genes causing cancer 4. Tumor biomarkers in bodily fluids 5. Mechanism of carcinogenesis 6. New therapies in cancer 7. Epigenetic mechanism in cancer	15 hours

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HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD (AUTONOMOUS)

B.Sc. II Year Semester – III

SEC-I

BASICS IN BIOCHEMICAL CALCULATIONS AND BIOSTATISTICS

Code: BS301	
INSTRUCTION	
Theory Classes	2 Hrs/Week
Credit for Theory	2
Duration of Semester Examination	1 ½ hours
Duration of Internal Examination	25 minutes
Semester Examination Marks	35 Marks
Internal Marks	15 Marks

Unit Name	TOPICS	HOURS PER UNIT
1. Basic Biochemical Calculations	1. Units and measurements 2. Concentration of analyte: Mole, Molarity, Normality and percent solutions 3. Concept of density and specific gravity 4. Enzymes activity, Specific and Purity index 5. pH scale and measurements of redox potential 6. Concept of buffers and buffer preparations 7. Construction of calibration curve and absorption curve (λ_{max})	15 hours
2. Biostatistics	1. Basic statistical concepts : population, sampling and variables 2. Biostatistics: Measures of central tendency (Mean, Median, Mode) 3. Measurements of dispersion: Standard deviation, Standard error, Spread sheets 4. Depiction of data by graphical methods 5. t-Test 6. Regression and Correlation, precision and accuracy 7. ANOVA	15 hours

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HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD

(AUTONOMOUS)

B.Sc. II Year Semester – IV

SEC-3

APPLIED AND COMPUTATIONAL BIOCHEMISTRY

Code: BS401
INSTRUCTION
Theory Classes
Credit for Theory
Duration of Semester Examination
Duration of Internal Examination
Semester Examination Marks
Internal Marks

2 Hrs/Week
2
1 ½ hours
25 minutes
35 Marks
15 Marks

Unit Name	TOPICS	HOURS PER UNIT
1.Enzyme and Protein purification methods	1. Homogenization techniques 2. Centrifugation methods 3. Ammonium sulfate precipitation and Dialysis 4. Column chromatography and determination of molecular weight 5. UV-Vis spectrophotometer 6. Native PAGE 7. SDS-PAGE	15 hours
2. Computatinal Biochemistry	1. Introduction to Computational Science and applications 2. Software packages used in Docking designing 3. Principles of molecular modeling- Drug designing 4. Drug-Biomolecule, Receptor-Biomolecule interactions 5. Applications in Enzyme Kinetics (Km & V max) 6. Metabolic database (KEGG) 7. Gene identification, Protein Data Bank	15 hours

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**HINDI MAHAVIDYALAYA, NALLAKUNTA,
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(AUTONOMOUS)**

**B.Sc Biochemistry - III Year
Semesters-V & VI -Paper -V/VI/GE
Theory Model Question Paper**

Time: 2 1/2hrs

Max. Marks: 70

SECTION A

6x3= 18M

I Write short notes on any Six of the following:

Marks

1. A question from Unit I
2. A question from Unit I
3. A question from Unit II
4. A question from Unit II
5. A question from Unit III
6. A question from Unit III
7. A question from Unit IV
8. A question from Unit IV

SECTION B

II Answer all the Questions.

4 X 13 = 52 Marks

9 (a) A question from Unit I
(OR)

(b) A question from Unit I

10 (a) A question from Unit II
(OR)

(b) A question from Unit II

11 (a) A question from Unit III.
(OR)

(b) A question from Unit III.

12(a) A question from Unit IV
(OR)

(b) A question from Unit IV.

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HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)

B.Sc Biochemistry – III Year
Semester –V & VI -Paper – V & VI
Practical Model Question Paper

Max. Marks: 25

Time: 3 hrs

- I. Principle writing
- II. Minor experiment
- III. Major experiment
- IV. Viva & Record

(5 Marks)

(5 Marks)

(10 Marks)

(5 Marks)

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**HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)**

B.Sc Biochemistry – III Year

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S.No.	Name and Designation	Mobile No.
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3	Ms.G.Bindu Department of Biochemistry Aurora Degree and PG College, Chikkadpally,Hyderabad	9100000504
4	Ms.C.Vanisree Department of Biochemistry St.Pious X Degree and PG college,Nacharam,Hyderabad	9703599392
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6	Dr.Ch.Vidya Assistant professor Department of Biochemistry Govt.City College,Nayapool,Hyderabad	95333926170

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