HINDI MAHAVIDYALAYA

(AUTONOMOUS)

DEPARTMENT OF BIOCHEMISTRY

2016-2017

HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)
BOARD OF STUDIES
DEPARTMENT OF BIOCHEMISTRY

Chairperson
Mr. L. Venkanna
Head – Department of Biochemistry
Hindi Mahavidyalaya
Nallakunta, Hyderabad.

University Nominee
Prof. S. Satyanarayan Singh
Chairman – BOS
Department of Biochemistry
Osmania University, Hyderabad.

Members of BOS

1. Dr. Karuna Rupula
   Asst. Prof. - Department of Biochemistry
   Osmania University
   Hyderabad.

2. Dr. S. Ravi Kiran
   Head – Department of Biochemistry
   Aurora Degree & PG College,
   Chikkadpally, Hyderabad

3. Dr. Vikas Sharma
   Head- Department of Microbiology
   Hindi Mahavidyalaya
   Nallakunta, Hyderabad

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 (Chairperson)
   Mr. L. Venkanna – Department of Biochemistry

2. The entire faculty of each specialization.
   Mr. L. Venkanna

3. One expert to be nominated by the vice-chancellor from a panel of five recommended by the College Principal.

   1. Prof. S. Satyanarayan Singh, Chairman, BOS, Department of Biochemistry

4. Three experts in the subject from outside the college to be nominated by the Academic Council.
   1. Dr. Karuna Rupula, Department of Biochemistry, Osmania University, Hyd.
   2. Dr. S. Ravi Kiran, Head – Department of Biochemistry, Aurora Degree & PG College, Chikkadpally, Hyderabad.

5. Dr. Vikas Sharma, Head – Department of Microbiology, Hindi Mahavidyalaya, Nallakunta, Hyderabad appointed as a BOS member.

Experts from outside the College whenever special courses of studies are to be formulated-To be nominated.

(a) Other members of staff of the same faculty.

Syllabus copy for both the semesters is enclosed.
Syllabus was approved by the Members of BOS.

1.4 Marks allotted for Internal and end Semester exam will be followed as per O.U. (As it is about to change)

1.5 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 Internal exams will be conducted.

2. Semester exam will be conducted as per the Almanac which will be provided by the exam branch. Internal exam duration will be 30 Mts. and Semester exam duration will be of 3 hrs.

3. Model Question paper for Semester I and Semester II was discussed. Theory paper for each Semester will have 2 sections.

i) Section A contains 10 short Questions. (10X2=20 Marks)

ii) Section B contains 4 Essay type Questions with internal choice. (15x4=60 Marks)

Pattern of Question Paper was approved by Members of BOS.

1.6 Discussion on Practical Exam Model paper.

It was decided in BOS meeting that 25 Marks Practical Exam will be held in each Semester and 1 credit will be given for Practical in each Semester.
The Practical model paper was approved by the Members of BOS.

1.7 Panel of Examiners

The panel of examiners was approved by the members.
List is enclosed.

1.8 Any other matter.

1. It is resolved to establish a lab for B.Sc. Biochemistry practical's.
2. Environmental Studies Syllabus also approved by BOS members in BOS meeting.

1.9 Vote of Thanks

Meeting concluded with the Vote of Thanks by Mr. L. Venkanna

Chairperson

University Nominee

Members

1.

2.

Principal

DEPARTMENT OF BIOCHEMISTRY
AGENDA OF THE MEETING
MONDAY 22.8.2016

1.1 Welcome address by the chair.

1.2 Previous Meeting Details.

1.3 Details of credit base choice system.

1.4 Discussion and Distribution of Common Core Syllabus.

1.5 Discussion on Pattern of Semester Exam

1.6 Discussion of Pattern of Semester Exam Model Question Paper & Internal Model Question Paper

1.7 Marks allotted for Internal and end Semester exams.

1.8 Panel of Examiners

1.9 Any other matter

1.10 Vote of Thanks

HINDI MAHAVIDYALAYA,NALLAKUNTA,HYDERABAD
(AUTONOMOUS)

B.Sc –I year
Scheme of Instruction & Evaluation

Group: (Bio-chem, Mic, Chem.) I semester

Sub Code	Sub Name	Course Type	Hours/ Week		Credit		Exam Duration	Marks			
			Th	Pr	Th	Pr	Th/Pr	Sem	Internal 30 min	Total	Practical
	Environmental studies	AECC-I	2	-	2	-	1 ½ Hrs	15	-	15	-
	English	CC-IA	5	-	5	-	2 Hrs	40	10	50	-
	Second language	CC-2A	5	-	5	-	2 Hrs	40	10	50	-
	Bio- Chemistry	DSC-IA	4	2	4	1	2 Hrs	40	10	50	25
	Microbiology	DSC-2A	4	2	4	1	2 Hrs	40	10	50	25
	Chemistry	DSC-3A	4	2	4	1	2 Hrs	40	10	50	25
	TOTAL		24	6	27			215	50	265	75

HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)
B.Sc. 1st Year Biochemistry
Semester – 1
Paper I

Code:	
Instruction	
Theory Classes	**4 Hrs/Week**
Practical Classes	**2 Hrs/Week**
Credit for Theory	**4**
Credit for Practical	**1**
Duration of Semester Examination	**2 Hrs**
Duration of Internal Examination	**30 Min**
Semester Examination Marks	**40 Marks**
Internal Examination Marks	**10 Marks**

BS104 (Theory) Chemistry of Biomolecules .

Unit 1: Introduction

Scope of biochemistry Water as biological solvent Weak acids and bases pH, buffers, Biological Buffers, Henderson- Hasselbalch equation.(Simple numerical problems) Stereo chemistry with reference to carbohydrates & amino acids.

Unit 2: Carbohydrates

Classification of carbohydrates Mono saccharide straight chain and ring structures Reactions of monosaccharides,mutarotation, aminosugars&glycosides Disaccharides, oligosaccharides& polysaccharides Storage and structural polysaccharides, glycosaminoglycan's and bacterial cell wall polysaccharides.

Unit 3: Lipids

Classificationof lipids, essential fatty acids. Reactions & properties of lipids
General properties and structures of neutral fats, waxes, phospholipids sphingolipids, cholesterol, glycolipids. Prostaglandins and lipoproteins.
Bio membranes, behavior of amphipathic lipids in water, formation of micelles, bilayers, vesicles, membrane composition and fluid mosaic model.

Unit 4: Amino acids & proteins

Classification, structure, stereochemistry and chemical reactions of amino acids.
Titration curve of glycine &pk values.
Essential, nonessential amino acidsand non-protein aminoacids. Peptide bond- Nature and conformation, Naturally occurring peptides – Glutathione, encephalin. Outlines of protein classification, structural organization of proteins: primary, secondary, tertiary and quaternary structures (ex. hemoglobin & myoglobin). General properties of proteins, denaturation and renaturation of proteins. Determination of amino acid composition of proteins.

Reference Books:

1. Biochemistry - J. L Jain

2. Biochemistry – U Satyanarayana

3. Biophysical Chemistry - Upadyaya

HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)
B.Sc. 1st Year Biochemistry
Semester – I
Practical Paper - I

Code:	
Instruction	**2 Hrs / Week**
Duration of Exam	**2 Hrs**
Marks for Exam	**25 Marks**
Laboratory Course	**30 Hrs**

BS104 (practical) Qualitative Analysis of biomolecules

Laboratory general safety procedures. Preparation of standard solutions Determination of pKa values of amino acids by titration Preparation of buffers Qualitative identification of Carbohydrates, Amino acids.

HINDI MAHAVIDYALAYA,NALLAKUNTA,HYDERABAD
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B.Sc – I year
Scheme of Instruction & Evaluation

Group: (Bio-chem, Mic, Chem.) II semester

Sub Code	Sub Name	Course Type	Hours/ Week		Credit		Exam Duration	Marks			
			Th	Pr	Th	Pr	Th/Pr	Sem	Internal 30 min	Total	Practical
	Gender Sensitization	AECC-2	2	-	2	-	-	-	-	-	-
	English	CC-IB	5	-	5	-	2 Hrs	40	10	50	-
	Second language	CC-2B	5	-	5	-	2 Hrs	40	10	50	-
	Bio- Chemistry	DSC-IB	4	2	4	1	2 Hrs	40	10	50	25
	Microbiology	DSC-2B	4	2	4	1	2 Hrs	40	10	50	25
	Chemistry	DSC-3B	4	2	4	1	2 Hrs	40	10	50	25
	TOTAL		24	6	27				50		75

HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)
B.Sc. 1st Year Biochemistry
Semester – II
Paper-II

Code:	
Instruction	
Theory Classes	**4 Hrs/Week**
Practical Classes	**2 Hrs/Week**
Credit for Theory	**4**
Credit for Practical	**1**
Duration of Semester Examination	**2 Hrs**
Duration of Internal Examination	**30 Min**
Semester Examination Marks	**40 Marks**
Internal Examination Marks	**10 Marks**

BS204 (Theory) **Chemistry of Nucleic Acids & Biochemical Techniques**

Unit 1:

Composition of Nucleic acids

Nature (functions) of nucleic acids.

Structure of purines and pyrimidines.

Nucleosides, nucleotides, DNA & RNA.

Stability and formation of phosphodiesterlinkages, effect of acids, alkali and nucleases.

Photochemical and Spectral characteristics of Nucleic acid.

Unit 2:

Structure of nucleic acids

Watson& Crick DNA double helix structure.

Introduction to circular DNA, supercoiling, helix to random coil transition, denaturation of nucleic acids.

Hyper chromic effect, Tm values and their significance.

Reassociation kinetics, cot curves and their significance.

Different types of RNA and their biological functions.

Unit3:

Specrophotometric and Centrifugation Techniques.

Colorimetry and spectrophotometry.

Beer-Lamberts law and its limitations.

UV, visible spectra, molar extinction coefficient.

Principle of fluorimetry

Principle and applications of Centrifugation technique in biology

Unit.4

Chromatography techniques

Principle in chromatographic technique.

Application of chromatographic technique in paper chromatography

dimensional), TLC, gel filtration (molecular sieve), ion exchange

Chromatography and affinity chromatography.

Reference Books:

1. Biochemistry – Nelson & Cox

2. Biochemistry – Voet & Voet

3. Principle of Biochemistry – Lehininger

HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)
B.Sc. 1st Year Biochemistry
Semester – II
Practical Paper- II

Code:	
Instruction	**2 Hrs / Week**
Duration of Exam	**2 Hrs**
Marks for Exam	**25 Marks**
Laboratory Course	**30 Hrs**

BS204 (practical) Quantitative Analysis of Biomolecules

Aminoacid Estimation by Ninhydrin method.

Protein Estimation by Folin`s Method.

Total Sugar Estimation by Anthrone Method.

Total Reducing Sugar Estimation by Dinitrosalicylate

Estimation of Keto sugar by Roe`s resorcinol Method

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B.Sc Biochemistry Ist Year
Semester - I
Paper - I
Internal Examination Model Paper

Time – 30Min **Total Marks: 10 Marks**

Note: Each question carriers 1 Marks.

Multiple choice type: **10 X 1 = 10 Marks**

1. The following polysaccharide is composed of β – glycolsidic bonds.

   (a) Startch (b) Glycogen (c) Dextrin (d) Cellulose

2. Ribose and deoxyribose differ in structure around a single carbon, namely

   (a) C1 (b) C2 (c) C3 (d) C4

3. Name the test employed to check the purity of butter through the estimation of volatile fatty acids

   (a) Iodine number (b) Saponification number (c) Reichert – meissl number (d) Acid number

4. The imino acid found in protein structure

   (a) Arginine (b) Proline (c) Histidine (d) Lysine

Fill in the Blanks:

5. Name a Non-reducing disaccharide _____

6. Give an example of a glycosidic antibiotic _____

7. The steroids contain a cyclic ring known as _____

8. Proteins are the polymers of _____

Define the following in one or two lines:

9. Osazone formation

10. Zwitterion

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B.Sc Biochemistry Ist Year
Semester - I
Paper - I
Theory Model Question Paper

Time: 2hrs **Max. Marks: 40**

SECTION A

I Write short notes on any Four of the following: **4 X 2 = 8 Marks**

1. Water as Biological Solvent
2. Mutarotaion
3. Lipoproteins
4. Micelles
5. Glycolipids
6. Peptide bond

SECTION B

II Essay Questions. Answer all the Questions **4 X 8 = 32 Marks**

7 (a) Define the buffers? Write the mechanism of buffer action?

(OR)

(b) Write the equation for Henderson – Hasselbalch?

8. (a) Give an account of the structural configuration of Monosaccharides, with special reference to the glucose?.

(OR)

(b) Describe the structure and functions of Mucopolysaccharides?.

9 (a) Write an account of classification of lipids with suitable examples?.

(OR)

(b) Describe the structure of steroids? Add a note on the functions of cholesterol?

10 (a) Describe the classification of amino acids along with their structures?.

(OR)

(b) Describe the classification of proteins with suitable examples?.

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B.Sc Biochemistry Ist Year
Semester - I
Paper - I
Practical Model Question Paper

Time – 2 Hrs **Total Marks: 25 Marks.**

I Write the preparation of buffers? 5 Marks

II Analyse the given mixture, Identify of carbohydrate, Amino acids and Lipids?

15 Marks

III Record **2 Marks**

IV Vivavoce **3 Marks**

U.G. I year Semester-I - (B.Sc/B.A./B.Com) CBCS

Environmental Studies

AECC-2 **(2 hrs./week)** **Credits – 2**

(30 hours)

UNIT - I : Ecosystem, Biodiversity & Natural Resources (15 hrs.)

1. Definition, Scope & Importance of Environmental Studies.
2. Structure of Ecosystem – Abiotic & Biotic components Producers, Consumers, Decomposers, Food chains, Food webs, Ecological pyramids)
3. Function of an Ecosystem :Energy flow in the Ecosystem (Single channel energy flow model)
4. Definition of Biodiversity , Genetic,Species & Ecosystem diversity , Hot-spots of Biodiversity, Threats to Biodiversity , Conservation of Biodiversity (Insitu & Exsitu)
5. Renewable & Non – renewable resources, Brief account of Forest , Mineral & Energy (Solar Energy & Geothermal Energy) resources
6. Water Conservation , Rain water harvesting & Watershed management.

UNIT – II: Environmental Pollution , Global Issues & Legislation (15 hrs.)

1. Causes, Effects & Control measures of Air Pollution, Water Pollution
2. Solid Waste Management
3. Global Warming & Ozone layer depletion.
4. Ill – effects of Fire- works
5. Disaster management – floods, earthquakes & cyclones
6. Environmental legislation :-

(a) Wild life Protection Act (b) Forest Act (c) Water Act (d) Air Act

7. Human Rights
8. Women and Child welfare
9. Role of Information technology in environment and human health

❖ **Field Study:** **(5 hours)**

- Pond Ecosystem
- Forest Ecosystem

REFERENCES:

- Environmental Studies - from crisis to cure – by R. Rajagopalan (Third edition) Oxford University Press.
- Text book of Environmental Studies for undergraduate courses (second edition) by Erach Bharucha
- A text book of Environmental Studies by Dr.D.K.Asthana and Dr. Meera Asthana

U.G. I year Semester – I- (B.Sc/B.A./B.Com) CBCS

AECC-2

Environmental Studies

Credits – 2

THEORY MODEL PAPER

TIME: 1 ½ HOURS **MAX MARKS: 15**

SECTION-A

Answer the following in short: **3x1=3marks**

1. Food chains
2. Genetic Diversity
3. Ill – effects of Fire- works

SECTION-B

Answer the following essays: **2x6=12marks**

1 (a) Define Environmental Studies & write an essay on scope & importance of Environmental Studies

OR

(b)Write in detail about Energy resources.

2 (a) Write the Causes, Effects & Control measures of Air Pollution

OR

(b) Describe the role of Information technology in environment and human health

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B.Sc Biochemistry Ist Year
Semester - II
Paper - II
Internal Examination Model Paper

Time – 30Min **Total Marks: 10 Marks**

Note: Each question carriers 1 Marks

Multiple choice type: **10 X 1 = 10 Marks**

1 The Nitrogenous base not present in DNA structure.

(a) Adenine (b) Guanine c) Cytosine (d) Uracil

2. The following coenzyme is a Neucleotide.

(a) FAD (b) NAD+ (c) Co ASH (d) All of them

3. Proteins absorbs maximally UV radiation due to the presence of

(a) Tryptophan (b) Tyrosine (c) Phenyl alanine (d) All of the above

4. The term chromatography was coined by

(a) Tswett (b) Martin (c) Flehming (d) Roska

Fill in the Blanks:

5. Neucliec acids are the polymers of _____

6. The base pair G – C is more stable and stronger than A-T due to _____

7. The nature of light absorption in a solution is governed by _____.

8. Colorimeter is the instrument used for the measurement of _____ substances.

Define the following in one or two lines:

9. Fluorimetry

10. Affinity chromatography

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B.Sc Biochemistry Ist Year
Semester - II
Paper - II
Theory Model Question Paper

Time - 2 Hrs **Max Marks: 40**

SECTION – A

I Write short notes on any four of the following: **4 X 2 = 8 Marks**

1. Structure of purines and pyramidines.
2. Neucleosides.
3. Transfer RNA
4. Watson and crick DNA double helix structure
5. Principle of fluorimetry
6. Affinity chromatography

SECTION – B

II Essay Questions. Answer all the questions. **4 X 8 = 32 Marks**

7. a) Describe the structure of DNA?

OR

b) Describe the Neucleosides and Neucleotides?.

8. a) " The backbone of neucleic acid structure is 3' to 5' phosphodiester bridge" – Justify?

OR

b) Explain the types of RNA and their biological functions?

9. a) Describe Beer-Lamberts Law and its limitations?

OR

b) Describe the principle of fluorimetry?.

10. a) Explain the paper chromatography technique? And draw the diagram?

OR

b) Describe the TLC (Thin layer chromatography) technique?

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B.Sc Biochemistry Ist Year
Semester - II
Paper - II
Practical Model Question Paper

Time - 2 Hrs **Total Marks: 25**

I Describe the amino acids estimation by Ninhydrin method? 5 Marks

II Estimination of Keto sugar by Roe's resorcinol method? 15 Marks

III **Record** **2 Marks**

IV **Vivavoce** **3 Marks**

Hindi Mahavidyalaya

(Autonomous)

Chemistry Department

Panel of Examiners

I/II Gr.

S.No.	Name and Designation	Mobile No.
1	Mrs. D. Rajini Department of Biochemistry Bhavan's Vivekananda College of Science & Humanities, Sainikpuri, Secunderabad	
2	Dr. S. Ravi Kiran Head – Department of Biochemistry Aurora Degree & PG College Chikkadpally, Hyderabad.	
3	Ms. G. Bindu Department of Biochemistry Aurora Degree & PG College Chikkadpally, Hyderabad.	
4	Ms. C. Vanisree Head – Department of Biochemistry St. Pious X Degree & PG College Nacharam, Hyderabad.	

S. Ravi Kiran