PROCEEDINGS OF THE MEETING OF B.O.S. (UG) IN MICROBIOLOGY AND BIOTECHNOLOGY

The meeting of the B.O.S. (UG) in Microbiologyand Biotechnology was held on **18th June, 2014** in the Department of Microbiology and Biotechnology, Bangalore University, Bangalore. At the outset, the Chairman welcomed the members and initiated the proceedings.

Agenda-1

The Credit Based Semester Scheme for B.Sc. in Microbiology and Biotechnology, the Syllabus (theory and practical) and Scheme of examination for I, II, III & IV Semesters were finalized and approved.

Agenda-2

The panel of examiners for UG Microbiology and Biotechnology (both external and internal) was modified and approved for the year 2014-15.

Agenda-3

The B.O.S. approved the list for the formation of B.O.E. (UG) in Microbiology and Biotechnology for the year 2014-15.

The meeting concluded with the Chairman thanking all the members for their co-operation.

Members present:

- 1. Dr. Shastri P. S
- 2. Dr. Jyotsna B. S
- 3. Dr. Bharathi
- 4. Smt. Pushpalatha. T
- 5. Dr. Vijaya. B
- 6. Dr. ShanthiIyer
- 7. Dr. S.K. Sarangi

B.Sc. CREDIT BASED SEMESTER SCHEME BIOTECHNOLOGY (PART 2) SCHEME OF INSTRUCTIONS AND CREDITS

Paper No.	Title of the paper	Type of	Hours/	Duration	IA	Exam	Total	Credits
		paper	Week	of Exam			Marks	
				(Hours)				
I Semester								
BTT-101	Cell Biology & Genetics	Т	4	3	30	70	100	2
BTP-102	Cell Biology & Genetics	Р	3	3	15	35	50	1
Total Marks and Credits for I semester							150	3

Paper No.	Title of the paper	Type of paper	Hours/ Week	Duration of Exam (Hours)	ΙΑ	Exam	Total Marks	Credits
II Semester								
BTT-201	General Microbiology & Biostatistics	Т	4	3	30	70	100	2
BTP-202	General Microbiology	Р	3	3	15	35	50	1
Total Marks and Credits for II semester							150	3

Paper No.	Title of the paper	Type of	Hours/	Duration	IA	Exam	Total	Credits
		paper	Week	of Exam			Marks	
				(Hours)				
		III	Semester					
BTT-301	Biological chemistry	Т	4	3	30	70	100	2
BTP-302	Biological chemistry	Р	3	3	15	35	50	1
Total Marks and Credits for III semester							150	3
Paper No.	Title of the paper	Type of	Hours/	Duration	IA	Exam	Total	Credits
		paper	Week	of Exam			Marks	
				(Hours)				
IV Semester								
BTT-401	Molecular biology	Т	4	3	30	70	100	2
BTP-402	Molecular biology	Р	3	3	15	35	50	1

Total Marks and Credits for IV semester							150	3
Paper No.	Title of the paper	r Type of Hours/ Duration IA Exam						Credits
		paper	Week	of Exam			Marks	
				(Hours)				
	·	V	Semester		•			
BTT-501	Genetic Engineering &	Т	4	3	30	70	100	2
	Environ. Biotechnology							
BTT-502	Immunology & Animal	Т	4	3	30	70	100	2
	Biotechnology							
BTP-503	Genetic Engineering &	Р	3	3	15	35	50	1
	Environ. Biotechnology							
BTP-504	Immunology & Animal	Р	3	3	15	35	50	1
	Biotechnology							
	Total Marks a	nd Credits fo	or V semes	ter	•		300	6

Paper No.	Title of the paper	Type of paper	Hours/ Week	Duration of Exam	IA	Exam	Total Marks	Credits
		N/I	Com ogtor	(IIOUIS)				
		VI	Semester					
BTT-601	Plant Biotechnology	Т	4	3	30	70	100	2
BTT-602	Industrial Biotechnology	Т	4	3	30	70	100	2
BTP-603	Plant Biotechnology	Р	3	3	15	35	50	1
BTP-604	Industrial Biotechnology	Р	3	3	15	35	50	1
Total Marks and Credits for VI semester							300	6

Internal assessment:

Theory : (30)	
(a) Tests	- 10
(b) Assignments	- 15
(c) Attendance	- 05
Practical : (15)	
(a) Tests	- 10
(b) Class Records	- 05

SEMESTER III

BTT 301- BIOCHEMISTRY AND BIOPHYSICS

DADT A. DIACUMEISTDY			
PARI-A: BIOCHMEISTRY	Total Hours: 35		
Unit 1. Amino acids Classification and properties due to intra, centre and side chain, titration against ac and abase.	id 4 Hours		
Unit 2. Proteins			
Classification based on structure and functions, structural organization of proteins (Primary, secondary, tertiary and quaternary structure)	6 Hours		
Unit 3.Enzymes			
Introduction, classification, enzyme kinetics, factors influencing enzyme activity, co-Enzymes and co-factors.	8 Hours		
Unit 4.Carbohydrates Structure, properties and classification with examples, Carbohydrates as a source o Energy.	f 5 Hours		
Unit 5.Lipids Structure, properties and classification and functions.	5 Hours		
Unit 6.Vitamins Water Soluble and fat-soluble vitamins, Dietary source.	4 Hours		
Unit 7.Hormones Steroid hormones- structure O, E ₂ , P ₄ , Glucocortocoid hormones. mechanism of steroid hormone action.	3 Hours		
PART-B: BIOPHYSICS			
Unit 1.Introduction and scope of Biophysics. Total Hours: 17			
Unit 2.pH and buffer concepts.			
	1 Hour		
Unit 3. Chemical bonding – Ionic bond, covalent bond, hydrogen bond and peptide bond Vander waals forces, Principles of thermodynamics.	2 Hours		

2 Hours

Unit 4. Analytical techniques	
Principles and applications of	
a) Chromatography (Paper, thin – layer, column, GLC and HPLC)	
b) Centrifugation (RPM and G, Ultra centrifugation)	7 Hours
Unit 5.Spectroscopic techniques	
Principles and applications of UV, Visible spectroscopy, X-ray crystallography, NMR,	
IR, fluorescence & atomic absorption.	3 Hours
Unit 6. Iosotopes	
Types, their importance in biological studies, measure of radioactivity, GM counters and	
Scintillation counting.	2 Hours
BTP 302- Biochemistry and Biophysics	
Total	units : 15
1. Preparation of Buffers-Citrate and Phosphate.	1 Unit
2. Estimation of reducing sugars (Glucose, Maltose and Lactose) by DNS and Somoji's	
Methods.	4 Units
3. Estimation of Protein by Biuret method and Lowry's method	3 Units
4. Assay of enzyme activity- Amylase.	2 Units
5. Separation of Sugars by TLC.	2 Units
6. Estimation of Amino acids by ninhydrin method.	2 Units
7. Estimation of inorganic phosphate by Subba row method	1 Unit
Practical Examination Scheme	
(35 marks)	
Major: (2	20 marks)
a) Estimate the amylase enzyme activity of the given sample, write the principle and Procedure	
b) Write the principle of TLC/Ninhydrin Or	
Comment on preparation of Citrate buffer/Phosphate buffer	
Minor: (15 marks)
Estimation of Reducing sugar/Protein/Inorganic PO ₄	,
Record: To be submitted	

REFERENCES: BIOCHMISTRY

1. Principles of Biochemistry- AlbertLLehninger CBS Publishers & Distributors.

2. Biochemistry-LUbretStryer Freeman International Edition.

3. Biochemistry-KeshavTrehan Wiley Eastern Publications

- 4. Fundamentals of Biochemistry J.L. Jain S.Chand and company
- 5. Biochemistry, Prasaranga, Bangalore University
- 6. Fundamental of Biochemistry-Dr. A.C. Deb
- 7. Textbook of Organic Chemistry (A Modern approach) P.L. Soni, Sultan Chand and Sons, Publishers.
- 8. The Biochemistry of Nucleic acid-tenth Edition-Roger L.P. Adams, John T. Knower and David P. Leader, Chapman and Hall Publications.

BIOPHYSICS

- 1. Narayanan, P (2000) Essentials of Biophysics, New Age Int. Pub. New Delhi.
- 2. Bliss, C.J.K. (1967) Statistics in Biology, Vol. I McGraw hill. New York.
- 3. Campbell R.C. (1974) Statistics for Biologists, Cambridge Univ, Press, Cambridge
- 4. Daniel (1999) Biostatistics (3rd edition) Panima Publishing, Compotation
- 5. Sward law, A. C. (1985) Practical Statistics for Exponents Biologists, John Wiley and Sons, In
- 6. Khan (1999) Fundamentals of Biostatistics Publishing Corporation
- 7. Roy R.N. (1999) A Text Book of Biophysics New Central Book Agency

SEMISTER IV

BTT-401 – MOLECULAR BIOLOGY

Total Hours: 52

Unit 1.Molecular basis of life – an introduction RNA and DNA as genetic material, experimental proof of DNA as genetic material	3 Hours
experimental proof of Drvr as genetic material.	5 110015
Unit 2.Nucleic Acids	
Structure and functions of DNA and RNA	
Watson and Crick model of DNA and other forms of DNA (A and Z)	
Functions of DNA and RNA including ribozymes	5 Hours
Unit 3. DNA Replication	
Prokaryotic and Eukaryotic – Enzymes and proteins involved in replication, Theta	
model and Rolling circle model.	4 Hours
Unit 4. DNA Repair	
Causes and mechanism – photoreactivation, excision repair, mismatch repair,	
SOS repair.	4 Hours
Unit 5. Recombination in prokaryotes	
Transformation, Conjugation and Transduction	5 Hours
Unit 6. Structure of Prokaryotic and Eukaryotic gene – genetic code, Properties	
and wobble hypothesis.	4 Hours

Unit 7. Transcription in Prokarvotes and Eukarvotes	
Mechanisms, Promoters and RNA polymerase, transcription factors, Post transcriptional modifications of eukaryotic mRNA.	5 Hours
Unit 8. Translation Mechanism of translation in prokaryotes and Eukaryotes, Post translational modification of Proteins.	7 Hours
Unit 9. Regulation of Gene Expression Regulation of Gene expression in Prokaryotes – Operan concept (Lac and Tryp) Regulation of Gene expression in Eukaryotes – transcriptional activation, galactose	
metabolism in yeast.	8 Hours
Unit 10. Gene organization and expression in Mitochondria and chloroplasts.	3 Hours
Unit 11.Insertional elements and transposons. Transposable elements in Maize and Drosophila	4 Hours
Transposable elements in Maize and Drosophila.	4 110u13
BTP 402 – Molecular Biology	I.I.: to: 15
Total	Units: 15
1. Preparation of DNA model	1 Unit
2. Estimation of DNA by DPA method.	1 Unit
3. Estimation of RNA by Orcinol method	1 Unit
4. Column chromatography – gel filtration (Demo)	
5. Extraction and partial purification of protein from plant source by Ammonium	0.11 L
6 Extraction and partial purification of protain from animal source by organic solvents	3 Units
7. Protein separation by Polyacrylamide Gel Electrophoresis (PAGE)	3 Units
8. Charts on- Conjugation, Transformation and Transduction	1 Units
Practical Examination Scheme (35 Marks)	
Major: Extraction and estimation of protein by salt precipitation method/organic solvent method (Plant and animal source)	20 Marks
Minor: Estimation of DNA/RNA and Comment on PAGE/Column chromatography/conjugation/transformation/transduction	15 Marks

Records: To be submitted

REFERENCES: MOLECULAR BIOLOGY

- 1. Glick, B.R and Pasternak J.J (1998) Molecular biotechnology, Principles and application of recombinant DNA, Washington D.C. ASM press.
- 2. Howe. C. (1995) Gene cloning and manipulation, Cambridge University Press, USA
- 3. Lewin, B., Gene VI New York, Oxford University Press.
- 4. Rigby, P.W.J. (1987) Genetic Engineering Academic Press Inc. Florida, USA.
- 5. Sambrook et al (2000) Molecular cloning Volumes I, II & III, Cold spring Harbor Laboratory Press New York, USA
- 6. Walker J. M. and Ging old, E.B. (1983) Molecular Biology & Biotechnology (Indian Edition) Royal Society of Chemistry U.K.
- 7. Karp. G (2002) Cell & Molecular Biology, 3rdEdition, John Wiley & Sons; I