

Model paper

KRISHNA UNIVERSITY :: MACHILIPATNAM

PG I Semester Regular Examinations, NOVEMBER 2011 (Regulation 2010-11)

M. Sc., Bio-technology (2 Years Course)

BIT 101 11

BIT-101: GENETICS & CELL BIOLOGY

Time: 3 Hours

Max. Marks :70M

Write 5 Questions; one from each unit. All questions carry equal marks. 5x14M=70M

UNIT - I

1. Describe fine structure and analysis of rII locus of T4 bacteriophages. 14M

OR

2. Answer two questions

- (a) Prove DNA as genetic material. 7M
(b) Explain Dihybrid cross. 7M

UNIT - II

3. Explain Mapping of bacterial chromosome by conjugation. 14M

OR

4. Answer two questions

- (a) Role of rec proteins. 7M
(b) Method of transduction. 7M

UNIT - III

5. Explain structure and function of Mitochondria with suitable diagram. 14M

OR

6. Answer two questions.

(a) Types of proteins in Plasma membrane. 7M

(b) Differences between Eukaryotic and prokaryotic cell. 7M

UNIT - IV

7. Explain organization of eukaryotic chromosome. 14M

OR

8. Answer two questions.

(a) Lampbrush chromosome. 7M

(b) Apoptosis. 7M

UNIT - V

9. Explain different types of cell signaling. 14M

OR

10. Answer two questions.

(a) Structure and functions of Microtubules. 7M

(b) Cell-cell interactions. 7M

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M. Sc., Bio-technology (2 Years Course)

BIT 102 11

BIT-102: BIOMOLECULES

Time: 3 Hours

Max. Marks :70M

Answer FIVE Questions; one from each unit. All questions carry equal marks. 5x14M=70M

UNIT - I

1. Explain classification of Carbohydrates with structures. 14M
OR
2. Answer two questions
 - (a) Lectins. 7M
 - (b) Reactions of monosaccharides. 7M

UNIT – II

3. Write about structure and physic-chemical properties of amino acids. 14M
OR
4. Answer two questions
 - (a) Nonribosomal peptide synthesis. 7M
 - (b) Modified Merrifield solid phase peptide synthesis. 7M

UNIT - III

5. Explain structural organization of Proteins. 14M

OR

6. Answer two questions.

(a) Ramachandra plot. 7M

(b) Explain structure and function Hemoglobin 7M

UNIT - IV

7. Write briefly about structure and biological role of triacyl glycerol, phospholipids, sphingolipids, prostaglandins. 14M

OR

8. Answer two questions.

(a) Structure and function of porphyrin. 7M

(b) Structure and function of Chlorophyll. 7M

UNIT - V

9. Explain different types of RNA. 14M

OR

10. Answer two questions.

(a) Structure of purines and pyrimidines. 7M

(b) Kinetics of reassociation. 7M

KRISHNA UNIVERSITY

I Semester Regular Examinations, November, 2011 (Regulation 2010-2011)

M. Sc., Bio-technology

BIT 103

Tools and Techniques in Biology

Time: 3 Hours

Max. Marks: 70

Write 5 Questions; one from each unit. All questions carry equal marks. (5x14=70M)

UNIT - I

1. What are buffers? Write about commonly used buffers?

OR

2. Write about biological buffer systems.

UNIT - II

3. Write the principle, definition and methodology of HPLC.

OR

4. Write the principle and methodology of Ion-exchange Chromatography.

UNIT - III

5. Write the principle, procedure and applications of SDS-PAGE.

OR

6. Give an account on Isoelectric focusing.

UNIT - IV

7. Describe the principle, instrumentation and applications of UV-Visible Spectrophotometer.

OR

8. Give an account on X-ray diffraction and its biological applications.

UNIT - V

9. What is Radioactivity? Write the nature and types of radioactivity.

OR

10. Describe the method of detection and measurement of radioactivity by GM Counter.

Model Question Paper
KRISHNA UNIVERSITY:: MACHILIPATNAM
PG I Semester Regular Examination (Regulation 2011)
M. Sc. Biotechnology (2years Course)
BIT- 104: Enzymology

BIT10411

Max. Marks: 70

All questions carry equal marks.

UNIT I

1. What is an active site? Describe the models of active site. 14M
(OR)
2. Write notes on 3X4½M
 - (a) enzyme classification
 - (b) properties of enzymes
 - (c) coenzymes

UNIT II

3. Derive Michaelis-Menten equation. Add a note on the significance of K_m 14M
(OR)
4. Write about 2X7M
 - (a) Mechanistic classification of Bi Bi reactions
 - (b) Factors affecting enzyme activity.

UNIT III

5. What is enzyme inhibition and describe various types of enzyme inhibitions. 14M
(OR)
6. Describe the steps of purification of enzyme. 14M

UNIT IV

7. Describe the mechanism of reaction catalyzed by chymotrypsin. 14M
(OR)
8. Write notes on the following 2X7M
 - (a) Use of substrates analogues for the determination of active site of enzymes
 - (b) Ribonuclease mechanism of action

UNIT V

9. Describe the physical methods of immobilization of enzymes and add a note on the industrial application of immobilized enzymes. 14M
(OR)
10. Write notes on 3X4½M
 - (a) Allosteric control
 - (b) Isoenzymes
 - (c) Multienzyme complex

BIT-104: ENZYMOLOGY

UNIT-I: Catalytic power, specificity, holoenzymes, apoenzyme, coenzyme and cofactor. Nomenclature and classification of enzymes, active site- Fischer and Koshland models. Collision theory, activation energy and transition state energy, the law of mass action and order reaction.

UNIT-II: Kinetics of single substrate enzyme catalysed reaction, equilibrium steady state assumption (Michaelis-Menten), transformation of Michaelis Menten equation, Lineweaver Burk, Eadie-Hofstee, Hanes plots. Determination of V_{max} , K_m , K_{cat} and their significance. Effect of pH, temperature, enzyme and substrate concentration on enzyme activity. Single displacement and Double displacement reaction.

UNIT-III: Reversible inhibition- competitive, uncompetitive and non competitive inhibition, allosteric and irreversible inhibitions. Assay of enzymes: Coupled kinetic assay, units of enzyme activity (IU), Turnover number, purification of enzymes and criteria of purity.

UNIT-IV: Tapping the enzyme substrate complex, use of substrate analogues, enzyme modifications by chemical procedures affecting aminoacid chain, treatment with protease, Factors contributing to the catalytic efficiency-proximity and orientation, covalent catalysis, acid-base catalysis, metal ion catalysis. Mechanisms of enzymes action-lysozyme, chymotrypsin and ribonuclease.

UNIT-V: Structure and functions of vitamin coenzymes, enzyme regulation, feed back inhibition, allosteric kinetics(ATCase), cooperativity, symmetry and sequential models. Isoenzymes (LDH) Multi-enzyme complex (PDH complex), Ribozymes (catalytic RNA) Abzymes (catalytic antibodies), immobilized enzymes and applications.

PRACTICALS

1. Assay of chymotrypsin and trypsin.
2. Isolation and partial purification of enzymes, amylases and cellulases.
3. Localization of enzymes – mitochondrial (SDH) and cytosolic (GSH)
4. Determination of characteristics of enzyme-catalyzed reaction (V_{max} and K_m).
5. Effect of temperature and pH on the rate of enzyme catalysed reaction.
6. Effect of inhibitors/activators on enzyme catalyzed reactions.
7. Immobilization of enzymes.

BOOKS RECOMMENDED

1. Principles of Biochemistry general aspects 1983- Smith et al McGraw Hill.
2. Principles of Biochemistry, 2001, Nelson & Cox, CBS India.
3. Biochemistry, Leninger, A.H.
4. Text book of Biochemistry, West, E.S., Todd, Manson & Vanbruggen. Macmillan.
5. Organic chemistry, I.L.Finar, ELBS, 1985.

KRISHNA UNIVERSITY

Machilipatnam – 521 001

M.Sc. Ist SEM GENERAL MICROBIOLOGY

Write any 5 Questions, each question carries 14 marks

UNIT 1

1. What is the causative agent of Malaria? Explain its lifecycle with a neat diagram? (14)
OR
2. Explain briefly the principles of bacterial taxonomy and classification of Bacteria

UNIT 2

3. Draw and explain the biosynthesis of bacterial cell wall? (14)
OR
4. Write a brief note on the following
A. Flagellum (4)
B. Endospore, (4)
C. inclusion bodies and (3)
D. Plasmids (3)

UNIT 3

5. General methods of cultivation, bacterial, animal and plant viruses? (14)
OR
6. Explain briefly general steps in replication of viruses diagrammatically? (14)

UNIT 4

7. Write the methods involved in Preservation and maintenance of bacterial cultures? (14)
OR
8. Explain the principle and instrumentation of Electron Microscopy (SEM and TEM).? (14)

UNIT 5

9. How would you explain synchronous culture and continuous growth of microbes?. (14)
OR
10. Explain the Kinetics of bacterial growth with derivations? (14)

M.Sc. Ist SEM GENERAL MICROBIOLOGY

GENERAL MICROBIOLOGY Syllabus

UNIT – I- HISTORY, SCOPE AND SIGNIFICANCE OF MICROBIOLOGY,

Cell structure of prokaryotic and eukaryotic cell. Principles of bacterial taxonomy, classification of Bacteria and general characteristics of each group including Rickettsia, Mycoplasma, Chlamydia, and Actinomycids. Characteristics of archeobacteria and fungi (Yeast, Dermatophytes, and opportunistic pathogens), Algae protozoa (Entamoeba and Plasmodium).

UNIT – II- ULTRA STRUCTURE OF BACTERIAL CELL

Structure and function of variants (capsule, Flagellum, Cilia, Endospore, inclusion bodies and Plasmids), Invariants (Cell wall, Cell membrane, Nucleoid, and Ribosomes) components.

UNIT – III- NATURE AND GENERAL PROPERTIES OF VIRUSES

Classification, Nomenclature of RNA and DNA Viruses, General Characteristics of TMV, Lambda Phage and HIV, general steps in replication of viruses, General Methods of Cultivation, Purification, detection and quantification of bacterial animals and plant virus, Prions and Virusoids, Viroids, satellite and defective virus practices .

UNIT – IV- MICROBIOLOGICAL TECHNIQUES

Sterilization and disinfection – Physical and Chemical methods. Isolation of pure Cultures, Cultivation of aerobic and anaerobic microbes. Media for growth of microorganisms (bacteria, Fungi, algae). Preservation and maintenance of cultures. Principle and applications of microscopy in microbiology- Bright field, Dark field, and Electron Microscopy (SEM and TEM). Methods of identification of bacteria.

UNIT – V- NUTRITION AND GROWTH:

Nutritional groups of Bacteria (autotrophs and heterotrophs) Nutritional mutants and their use in metabolic studies. Growth cycle of bacteria, Estimation of bacterial growth, factors influencing growth (physical and Chemical), synchronous culture and continuous growth of microbes.