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St Aloysius College (Autonomous)
Mangaluru
Semester I – P.G. Examination - M.Sc. Biotechnology
November - 2019

BIOCHEMISTRY AND METABOLISM

Time: 3 Hours

Max. Marks: 70

Note: Draw neat labeled diagrams/schematic sketches/structures wherever necessary

I. Write short notes on any FIVE of the following. (5x3=15)

1. Mutarotation
2. Structure and functions of chitin
3. Peptide Nucleic Acid (PNA)
4. Adenosine triphosphates
5. Micro RNA & their importance
6. Inhibitors of ETC
7. Transamination
8. Salvage pathways of Purine Ribonucleotides

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II. Write explanatory notes on any FIVE of the following. (5x5=25)

9. Lipoproteins
10. End group analysis & Sequencing
11. Structure and functions of t-RNA
12. Types of chemical bonds
13. Ketone body formation
14. Glycolysis and its regulation
15. Electron transport chain and oxidative phosphorylation
16. Denovo synthesis of pyrimidines

III. Answer any THREE of the following. (3x10=30)

17. Explain the TCA cycle and its regulation. Calculate its energetic and mention its significance.
18. Discuss the structural organisation of proteins with suitable examples.
19. Discuss the structure, occurrence and functions of Glycogen, Cellulose and Hyaluronic Acid.
20. Describe the reactions of the urea cycle and add a note on its regulation.
21. Describe the process of β -oxidation of Palmitic Acid and give its energetics. Add a note on the Carnitine Shuttle Mechanism.

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Semester I – P.G. Examination - M.Sc. Biotechnology
November - 2019

MICROBIOLOGY

Time: 3 Hours

Max. Marks: 70

Note: Draw neat labeled diagrams/schematic sketches/structures wherever necessary

I. Write short notes on any FIVE of the following. (5x3=15)

1. Commensalism between microorganisms
2. Leghaemoglobin
3. Numerical taxonomy
4. Sites of virus cultivation in an embryonated egg
5. Benign Malaria
6. Bacterial cytoskeleton
7. Oxazolidinones
8. Genome fingerprinting

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II. Write explanatory notes on any FIVE of the following. (5x5=25)

9. Structure of flagella
10. Methods of preserving bacterial culture
11. Sulphide based mutualism
12. Antiretroviral agents
13. Contribution of Louis Pasteur to the field of Microbiology
14. Bacterial biopesticides
15. Ultra structure of human immunodeficiency virus
16. Invasive candidiasis

III. Answer any THREE of the following. (3x10=30)

17. Compare and content cell wall of Gram positive and Gram negative bacteria.
18. Explain the pathogenecity, clinical features, lab diagnosis and treatment of entetic fever.
19. Write a detailed account on sexual reproduction in fungi.
20. Explain inoculum development, mass production and benefits of mycorrhizal biofertilizers.
21. Describe the structure and replication of a T₄ phage.

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Semester I – P.G. Examination - M.Sc. Biotechnology
November - 2019

CELL BIOLOGY

Max. Marks: 70

Time: 3 Hours

Note: Draw neat labeled diagrams/schematic sketches/structures wherever necessary

(5x3=15)

I. Write short notes on any FIVE of the following.

1. Singer and Nicholson's model of membranes
2. Diffusion and Osmosis
3. Cell senescence
4. Euchromatin
5. Cell cycle check points
6. Structure of Chloroplast
7. Integrins
8. Autocrine signaling

II. Write explanatory notes on any FIVE of the following.

(5x5=25)

9. Mechanism exocytosis
10. Active and passive transport
11. Glycosylation in Golgi complex
12. Polytene chromosome
13. Different stages of mitosis
14. Role of cyclins and cyclin dependent kinases in cell cycle control
15. Hormones as signaling molecules
16. G-Protein coupled receptors

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III. Answer any THREE of the following.

(3x10=30)

17. With the help of neat labelled diagram explain the mechanism of nerve impulse conduction.
18. Discuss the different types of cytoskeletal elements.
19. Describe the mechanisms involved in apoptosis.
20. Explain the general mechanisms of signal transduction of receptor tyrosine kinases.
21. Write an essay on second messengers, mode of action and importance.

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Semester I – P.G. Examination - M.Sc. Biotechnology
November - 2019

MOLECULAR GENETICS

Time: 3 Hours

Max. Marks: 70

Note: Draw neat labeled diagrams/schematic sketches/structures wherever necessary.

I. Write short notes on any FIVE of the following.

(5x3=15)

1. F-Plasmid
2. SOS
3. Cri-du-chat
4. Photoreactivation
5. Martin- Bell Syndrome
6. Allopatric speciation
7. Bar eye mutation
8. ABO Blood group (Multiple alleles)

II. Write explanatory notes on any FIVE of the following.

(5x5=25)

9. Recapitulation theory.
10. Lamarckism.
11. Site-specific recombination.
12. Write a note on different types of DNA damages.
13. Microdeletions.
14. What are multiple alleles? Explain it with suitable example.
15. Briefly discuss the human genome project.
16. Transformation experiment and mechanism.

III. Answer any THREE of the following:

(3x10=30)

17. Explain the different mechanisms of sex determination.
18. What do you mean by pedigree analysis? Write the symbols used in pedigree analysis. Add a note on its importance.
19. Give an account on Hardy-Weinberg equilibrium. Add a note on the factors affecting the same
20. Which are the syndromes associated with the numerical chromosome changes with reference to monosomy and trisomies?
21. Describe base excision and mismatch mechanism of DNA repair.

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Semester I – P.G. Examination – M. Sc. Biotechnology
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BIOCHEMISTRY AND METABOLISM

Time: 3 hrs.

Max Marks: 70

Note: Draw neat labeled diagrams/schematic sketches/structures wherever Necessary

I. Write short notes on any FIVE of the following. (5x3=15)

1. Mutarotation
2. Non protein amino acids
3. Transamination
4. Ketone body formation
5. Light harvesting complexes (LHC's)
6. Melting temperature
7. Inhibitors of ATP
8. Hyaluronate

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II. Write explanatory notes on any FIVE of the following (5x5=25)

9. Classification of Carbohydrates
10. Cellulose and Glycogen
11. Secondary structure of protein
12. 'B' Conformation of DNA
13. Glycolysis
14. C₄ pathway
15. Carnitine shuttle
16. β-oxidation of even chain saturated fatty acid

III. Answer any THREE of the following: (3x10=30)

17. Discuss in detail about chylomicron, HDL, LDL and VLDL.
18. Explain tertiary and quaternary structure of protein with suitable example.
19. Describe the Calvin Cycle in detail
20. Explain Urea cycle.
21. Give a detailed account on TCA cycle.

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Mangalore**

**Semester I – P.G. Examination – M. Sc. Biotechnology
November - 2018**

MICROBIOLOGY

Time: 3 hrs.

Max Marks: 70

Note: Draw neat labeled diagrams/schematic sketches/structures wherever necessary

I. Write short notes on any FIVE of the following. (5x3=15)

1. Koch Postulates
2. *Azolla anabaena*
3. Viral biopesticides
4. Antagonism
5. RNA Viruses
6. Flagella
7. Widal test
8. Icosahedral viruses

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II. Write explanatory notes on any FIVE of the following (5x5=25)

9. Nutritional grouping of microorganisms.
10. Mechanism of action of *Entamoeba histolytica*
11. Actinorhiza
12. H1N1 infection in humans
13. Mechanism of penetration of animal viruses
14. Mechanism of drug resistance
15. Hypothesis for the origin of chloroplast and mitochondria
16. Structure of TMV

III. Answer any THREE of the following: (3x10=30)

17. Give an account on the general characteristics, structure and reproduction in fungi
18. Describe the Ultrastructure of viruses
19. Discuss on the bacterial growth kinetics and intrinsic factors influencing growth.
20. Give a detailed account on Mycorrhiza
21. Describe the mechanism of action of *Candida albicans*, its diagnosis and treatment.

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Semester I – P.G. Examination – M. Sc. Biotechnology
November - 2018

CELL BIOLOGY

Time: 3 hrs.

Max Marks: 70

Note: Draw neat labeled diagrams/schematic sketches/structures wherever necessary

I. Write short notes on any FIVE of the following. (5x3=15)

1. Euchromatin
2. Integrins
3. Facilitated diffusion
4. Cohesins and Condensins
5. Structure of chloroplast
6. cAMP and its role
7. Exocytosis
8. Apoptosis

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II. Write explanatory notes on any FIVE of the following (5x5=25)

9. Synaptonemal Complex
10. Lysosome formation
11. Caveolae and lipid rafts
12. RBC as model membrane
13. Nuclear structure
14. Nucleus and cytosolic receptors
15. Structure and functions of Kinetochere
16. Integrins and selectins

III. Answer any THREE of the following: (3x10=30)

17. Explain the structure in functions of Golgi complex.
18. Give an account on components of cell cycle. Add a note on mechanics of cell division.
19. Describe the organization and functions of cytoskeletal filaments.
20. Explain in detail the types of cell signaling and the role of signalling molecules.
21. Discuss in detail the transport across membranes. Add a note on ion channels and mechanisms of endocytosis.

PS 505.1a

Reg. No.

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**St Aloysius College (Autonomous)
Mangaluru**

**Semester I – P.G. Examination - M.Sc. Biotechnology
November - 2018**

MOLECULAR GENETICS

Time: 3 Hours

Max. Marks: 70

Note: Draw neat labeled diagrams/schematic sketches/structures wherever necessary

I. Write short notes on any FIVE of the following: (5x3=15)

1. ABO Blood groups
2. Photo-reactivation
3. Specialized transduction
4. Bar-eye mutation
5. Isodicentric-15
6. Pedigree symbols
7. Sympatric speciation
8. De Vries Mutation Theory

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II. Write explanatory notes on any FIVE of the following: (5x5=25)

9. Dosage compensation
10. Site specific recombination
11. Martin-Bell Syndrome
12. Human karyotype construction
13. Lamarckism
14. Urey-Miller Experiment
15. Cri-du-chat and Patau syndromes
16. Types of plasmids

III. Answer any THREE of the following: (3x10=30)

17. Discuss the mechanism of Base and Nucleotide Excision Repair.
18. Write an essay on Amniocentesis and Chorionic Villus sampling.
19. Give an account of theories of origin of life.
20. Explain sex determination methods with examples.
21. Explain Holliday model of recombination.

PH 501.1

Reg. No:

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BIOCHEMISTRY AND METABOLISM

Time: 3 Hours

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Note: Draw neat labeled diagrams/schematic sketches/structures wherever necessary

I Write short notes on any FIVE of the following

(5x3=15)

1. Van der Waal's forces
2. Myoglobin
3. LDL
4. Micro RNAs
5. Oxidative stress
6. Activation of fatty acids
7. Transamination
8. Chlorophyll

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II Write explanatory notes on any FIVE of the following

(5x5=25)

9. Mutarotation
10. Polyunsaturated fatty acids
11. Ramachandran plot
12. Denaturation of DNA
13. Oxidative phosphorylation
14. Amphibolic and anapleurotic reactions
15. Ketogenesis
16. β oxidation of palmitic acid

III Answer any THREE of the following

(3x10=30)

17. Discuss the structure, occurrence and functions of hyaluronic acid.
18. Explain end group analysis and sequencing in proteins.
19. Write the pathway of glycolysis and discuss about its regulation.
20. Describe urea cycle and discuss its regulation
21. What is chemiosmotic hypothesis? Explain ETC in detail.

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MICROBIOLOGY

Time: 3 Hours

Max. Marks: 70

Note: Draw neat labeled diagrams/schematic sketches/structures wherever necessary

I. Write short notes on any FIVE of the following (Not exceeding 2 page each) (5x3=15)

1. Koch postulate
2. Heterocyst
3. Flagellar arrangement in fungi
4. Myco and phycobiont
5. Lysogenic conversion
6. Host specificity
7. Sereny test
8. Narrow spectrum antibiotic

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II. Write explanatory notes on any FIVE of the following (not exceeding 3 pages each) (5x5=25)

9. Nucleic acid hybridization
10. Mechanism of spore formation in bacteria.
11. Sulfide based mutualism.
12. Candidiasis
13. TMV
14. CaM virus
15. Cry protein
16. Inhibitors of protein synthesis

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III. Answer any THREE of the following: (3x10=30)

17. Explain bacterial growth curve and describe methods for measuring microbial growth.
18. General account on disease, diagnosis & treatment of H₁N₁.
19. Describe life cycle of temperate phage.
20. Describe Mycorrhiza as phosphate solubilizer
21. General account on Baculovirus.

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CELL BIOLOGY

Time: 3 Hours

Max. Marks: 70

Note: Draw neat labeled diagrams/schematic sketches/structures wherever necessary

I. Write short notes on any FIVE of the following (5x3=15)

1. Properties of biological membranes
2. Lipid raft
3. Glyoxysome
4. Lampbrush chromosomes
5. Kinetochore
6. Crossing over
7. Paracrine signalling
8. Direct cell interactions

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II Write explanatory notes on any FIVE of the following (5x5=25)

9. With illustration, describe fluid mosaic model of cell membrane
10. Discuss the mechanisms of endocytosis and exocytosis. Add a note on their significance.
11. Discuss the structural organisations of eukaryotic chromosomes. Add a note on the proteins associated with it.
12. Describe the ultra structural organizations of Mitochondria
13. Give a detailed outline of meiosis. Add a note on its significance.
14. Justify the statement "apoptosis is an essential component of life"
15. Give a general overview of signaling pathways in development and differentiation.
16. Write a note on desmosomes and hemidesmosomes.

III Answer any THREE of the following (3x10=30)

17. With illustrations, describe various types of transport across biomembranes.
18. Explain the structural details of microtubules with specific reference to cilia and flagella. Add a note on the motor protein associated with them.
19. Give a general overview of cell cycle control.
20. Discuss the mechanism of signal transduction by G-protein coupled receptors. Add a note on their significance
21. Explain the structural details of interphase nucleus.

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MOLECULAR GENETICS

Time: 3 Hours

Max. Marks: 70

Note: Draw neat labeled diagrams/schematic sketches/structures wherever necessary

I Write short notes on any FIVE of the following (5x3=15)

1. Multiple alleles
2. Genic balance theory
3. Down's syndrome
4. Bar eye mutation in Drosophila
5. Isodicentric 15
6. Environmental sex determination
7. De Vries mutation theory
8. Allopatric speciation

II Write explanatory notes on any FIVE of the following (5x5=25)

9. Site specific recombination
10. Dosage compensation
11. Oligonucleotide directed mutagenesis
12. Human karyotype construction
13. Microdeletion
14. Amniocentesis
15. Chemical origin of life
16. Darwinism

III Answer any THREE of the following (3x10=30)

17. Bacterial transformation - experiment and mechanism
18. Any three types of DNA repair mechanisms
19. Pedigree analysis
20. Concepts of molecular Hardy-Weinberg equilibrium
21. Different theories of origin of life
