

PH 501.1

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St Aloysius College (Autonomous)
Mangaluru
Semester I - P.G. Examination - M.Sc. Biotechnology
February 2021

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 properties of LDL
3. Glucogenic amino acids
4. Chargaff's rule
5. Regulation of glycolysis
6. BPG Shunt
7. Salvage pathway of purines
8. Ketogenesis

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

9. Structure & function of glycogen
10. Classification of fatty acids
11. Protein sequencing
12. Cot curve
13. Inhibitors of ETC
14. Gluconeogenesis
15. Deamination
16. Formation of Mevalonate

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

17. Discuss the classification of carbohydrates with suitable examples.
18. Discuss the different levels of structural organization of proteins.
19. Describe the process of glycolysis taking place under aerobic conditions. Add a note on its regulation.
20. Explain the synthesis of Palmitic acid with a note on its energetics.
21. Describe the pentose phosphate pathway and its regulation.

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Time: 3 Hours

Max. Marks: 70

MICROBIOLOGY
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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. Write a short note on the methods used in integrated pest management.
2. Prions
3. Differentiate batch and continuous culture system.
4. Biopesticides
5. Write a note on the use of extremophiles in biotechnology.
6. Distinguish between phenetic and phylogenetic classification.
7. Write a labelled diagram of a viral envelope.
8. Differentiate between ectomycorrhiza and endomycorrhiza. Give 2 examples for each.

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

9. Explain bacterial growth curve. Add a note on the generation time.
10. Write a note on Baltimore system of classification.
11. Explain the mass production of VAM. Add a note on its field application.
12. Discuss various methods of virus assay.
13. In what ways bacteria are classified based on their oxygen requirement? Give suitable examples.
14. Discuss hydrogen production from microbial fuel cells.
15. Explain human microbiome and their significance.
16. Describe the kinds of bioactive compounds isolated from marine microorganisms.

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

17. Explain the molecular methods of identification used in microbial taxonomy.
18. Describe the lytic and lysogenic cycle of viral replication.
19. Write a detailed account on the positive interactions among microorganisms.
20. Explain in detail symbiotic nitrogen fixation by *Rhizobium*.
21. Discuss the different types of culture media.

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CELL BIOLOGY

Time: 3 Hours

Max. Marks: 70

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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. Active transport
2. Aquaporin Channel
3. Autocrine signalling
4. Myosin
5. Neurotransmitters
6. Cell junctions
7. Cyclins
8. Necrosis

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

9. Function of G-protein coupled receptors
10. Factors affecting apoptosis
11. Centrosome and its function
12. Notch signaling pathway
13. Microtubule structure and function
14. Cell-cell adhesion molecules and their importance
15. Molecular organization of cellular membrane
16. Properties of electrical synapses

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

17. Discuss in detail Singer and Nicolson's model of cell membrane and its components.
18. Discuss and describe different stages of mitosis.
19. Different Second messenger systems and its importance.
20. Explain the different stages and significance of meiosis.
21. Discuss the structure and functions of microtubule based motor proteins.

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MOLECULAR GENETICS

Max. Marks: 70

Time: 3 Hours

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

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

(5x3=15)

1. R-plasmid
2. Environmental sex determination
3. Photo-reactivation
4. Robertsonian Translocation
5. Cri-du-chat
6. Karyotype
7. Special creation
8. Recapitulation theory

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

(5x5=25)

9. Allopatric speciation
10. Urey-Miller experiment
11. Dosage compensation in *Drosophila*
12. Specialized transduction
13. ABO blood grouping
14. Martin-Bell syndrome
15. CVS
16. Biogenesis

III. Answer any THREE of the following.

(3x10=30)

17. Write a detailed note on the Trisomies.
18. Describe DNA repair mechanism with reference to mismatch and SOS.
19. Discuss on any two types of pedigree analysis with an example.
20. Elaborate on Hardy-Weinberg equilibrium.
21. Explain in detail the chromosomal and hormonal methods of sex determination.
