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Subject Title: Microbial Physiology and Biochemistry

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Unit - I: **Microbial nutrition & growth**

Short Questions:

1. Macro Nutrients & Micro Nutrients
2. Growth factors
3. Facilitated Diffusion.
4. Active Transport.
5. Group Translocation
6. Photolithoautotrophs
7. Chemolithoautotrophs.
8. Photo-organoheterotrophs
9. Chemo-organoheterotrophs
10. Methylophiles & Mixotrophs
11. Autotrophs & Heterotrophs
12. Bacteriochlorophyll.
13. Photosynthetic Apparatus
14. Batch Culture
15. Continuous & Synchronous Culture.
16. Bi-Phasic(Diauxic Growth)
17. Viable count & Direct Microscopic
18. Turbidometry

Essay Questions:

19. What is nutrition? Give a detail account of nutritional requirement of bacteria.
20. What is active transport? How bacteria uptake their nutrition by this mechanism.
21. What is Facilitated diffusion? How bacteria uptake their nutrition by this mechanism.
22. What is Group translocation? How bacteria uptake their nutrition by this mechanism
23. Discuss the process of Photo-organoheterotrophs and Chemoorganoheterotrophs in detail.
24. Discuss the process of Photoithoautotrophs and Chemolithoautotrophs in detail.
25. Describe the photosynthetic apparatus in prokaryotes.
26. Describe different phases of growth in Batch Culture of microorganism
27. Describe various methods used to measuring Microbial growth.
28. Briefly discuss the Factors Influencing Microbial growth.
29. What is Biphasic growth? Why Synchronous growth system so useful to microorganism?
30. What is Synchronous growth culture? Why Synchronous growth system so useful to microorganism?

Unit - II: Microbial Metabolism**Short Questions:**

31. Chlorophylls & Bacteriochlorophyll.
32. Carotenoids & Phycobiliprotein
33. Cyclic photophosphorylation
34. Non-Cyclic photophosphorylation
35. Anoxygenic photosynthesis
36. Glycolysis.
37. Hexose Mono-Phosphate Pathway
38. ED Pathway
39. Anaplerotic Reaction

40. Oxidative Phosphorylation
41. Substrate Level Phosphorylation
42. Glyoxylate Cycle
43. Nitrate Respiration
44. Sulphate Respiration

Essay questions:

45. Explain briefly about aerobic respiration?
46. Explain briefly about anaerobic respiration?
47. What do you understand by electron transport chain?
48. Explain briefly about Glycolysis cycle?
49. Explain briefly about HMP cycle?
50. Write difference between Oxidative Phosphorylation and Substrate Level Phosphorylation?
51. Explain briefly about E D pathway?
52. Explain briefly about Glyoxylate Cycle
53. Explain briefly about TCA cycle?
54. Describe briefly about oxygenic photosynthesis.
55. Describe briefly about anoxygenic photosynthesis

Unit – III: Biomolecules:

Short questions:

56. Monosaccharides
57. Oligosaccharides
58. Polysaccharides
59. Difference between phospholipids and glycolipids
60. Sterols & Sphingolipids
61. Phospholipids

62. Nucleoside & Nucleotide
63. Nitrogenous bases
64. Amino Acids
65. Secondary structure of proteins
66. Enzyme Unit
67. Lock and Key model
68. Competitive Inhibition
69. Un-Competitive & Non-Competitive inhibition
70. Induced fit model
71. Co-enzyme & Co-factor

Essay Questions:

72. What are Carbohydrate? Classify carbohydrates and describe their significance in biological system.
73. What are lipids? Describe different categories of lipids and its significance
74. Describe the general structure, classification and chemical properties of amino acids
75. Give an account on different characteristics of proteins?
76. Describe double helix model of DNA with the help of diagram. Briefly describe various forms of DNA double helix
77. Describe the structure and function of different types of RNA molecule
78. Describe the structure and functions of nucleic acids?
79. Give an account on Classification of Enzymes and Nomenclature of Enzyme?
80. Give a detailed account in inhibition of enzyme activity.
81. Give an account on properties of enzyme
82. What is Bio-catalysis? Write in detail about the factor affecting the catalytic activity of enzyme?

Unit - IV: Bio-Chemical techniques:**Short questions:**

83. Hydrogen ion concentration
84. Beer - Lambert's law
85. Buffers
86. Paper Chromatography
87. Thin layer chromatography
88. Agarose gel electrophoresis
89. SDS PAGE
90. Colorimeter

Essay Questions:

91. What are buffers? Describe the role of buffers in biological reactions?
92. Give an account on principles and applications of Colorimetry
93. Describe paper chromatography in detail.
94. Define pH and its measurement
95. What is electrophoresis? Write its principles and application.
96. Give an account on buffers in biological reactions and its preparation