

Master of Science (M.Sc.) Semester—I (CBCS) (Microbiology) Examination
MICROBIAL METABOLISM (M.M.)

Paper—1

Paper—I

Time : Three Hours]

[Maximum Marks : 80

Note :— (1) **ALL** questions are compulsory and carry equal marks.

(2) Draw diagrams wherever necessary.

1. Discuss the Biosynthetic pathway of membrane phospholipids. 16

OR

 - (a) Describe various types of Bacterial lectins. 8
 - (b) Write a note on Bacterial peptidoglycan synthesis. 8
2. Explain the biosynthetic pathways of any two aromatic amino acids. 16

OR

Describe the biosynthesis of purine ribonucleotides and add a note on its regulation. 16
3. Discuss the process of photosynthesis in green and purple bacteria. 16

OR

Explain the process of Noncyclic photophosphorylation in cyanobacteria. 16
4. Describe the process of Nitrification and Denitrification. Write a note on Anamox. 16

OR

Explain the process of Root nodule formation and add a note on Nitrogenase enzyme complex. 16
5.
 - (a) What are Ketone bodies ? 4
 - (b) Write a note on Salvage pathway. 4
 - (c) Describe the phenomenon of Bioluminescence. 4
 - (d) Explain the process of Methane formation. 4

Master of Science (M.Sc.) (Microbiology) Semester-I (C.B.C.S.) Examination

MICROBIAL METABOLISM (M.M.)

Paper—1

Paper—1

[Maximum Marks : 80

Time : Three Hours]

Note :— (1) **ALL** questions are compulsory and carry equal marks.

(2) Draw diagram wherever necessary.

1. Describe in detail peptidoglycan synthesis in Gram positive bacteria. 16
- OR**
2. Explain Con A, GS4, WGA and MBP-I with its applications. 16
2. Describe biosynthesis of Phenylalanine and tyrosine. 16
- OR**
3. Illustrate with the help of diagram, structure and function of protein domain and motif. 16
3. Describe the reaction center of purple photosynthetic bacteria and photosynthetic events for generating ATP. 16
- OR**
4. Describe the oxygenic photosynthesis in cyanobacteria in detail. 16
4. What is Methanogenesis ? Explain schematic pathway for methane production and the role of co-enzymes involved in it. 16
- OR**
5. What is symbiotic N_2 -fixation ? Discuss the mechanism of symbiotic N_2 -fixation. 16
5. Writes notes on :— 4
- (a) Ketone bodies 4
- (b) Unusual structures of nucleic acids 4
- (c) Oxidation of Iron 4
- (d) Denitrification. 4

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Master of Science (M.Sc.) Semester-I (C.B.C.S.) (Microbiology) Examination
MICROBIAL METABOLISM (M.M.)

Paper-I

Paper-I

Time : Three Hours]

[Maximum Marks : 80

N.B. :—ALL questions are compulsory and carry equal marks.

1. Describe in detail Con A and GS4 as informational molecules. 16
OR
Discuss the biosynthesis of bacterial peptidoglycan. 16
2. Discuss the structure of Duplex DNA and G-tetraplex orientation. 16
OR
Discuss in detail protein folding and denaturation of proteins. 16
3. Discuss the anoxygenic photosynthesis of Green sulphur bacteria and non-sulphur bacteria. 16
OR
Discuss the oxidation of reduced sulphur and iron compounds. 16
4. Discuss in detail Nitrate reduction and denitrification. 16
OR
Describe in detail the process of acetogenesis in bacteria. 16
5. Write notes on :
 - (A) Ketone bodies 4
 - (B) Common motifs and their role in metabolism 4
 - (C) Hydrogen bacteria 4
 - (D) Nitrogenase Enzyme Complex. 4

Shri Shivaji Science College, Congress Nagar, Nagpur

M.Sc. Semester I Microbiology

Preliminary Examination Winter 2019

Paper I- Microbial Metabolism (MM)

Time: 3 hrs

Max. Marks:80

- Q.1. What are membrane lipids? Discuss the biosynthetic pathway of membrane phospholipids. 16
- OR**
- (a) Explain in brief about ConA, MBP-1, VP1 and CT. 08
- (b) Describe the biosynthesis of peptidoglycan in Gram positive bacteria. 08
- Q.2. Discuss the biosynthetic pathway of Aromatic amino acids. 16
- OR**
- Write a note on: (a) Unusual structures of DNA 08
- (b) Purine biosynthesis 08
- Q.3. Describe the reaction centre of purple photosynthetic bacteria and photosynthetic events for generating ATP 16
- OR**
- Explain the process of Non-cyclic photophosphorylation in Cyanobacteria. 16
- Q.4. What is methanogenesis? Explain schematic pathway of methane production and Co-enzymes involved in it. 16
- OR**
- Describe acetogenesis and sulphate reduction. 16
- Q.5. (a) Role of Chaperones in protein folding 04
- (b) Symbiotic Nitrogen Fixation 04
- (c) Reverse TCA cycle 04
- (d) Hydrogen oxidation and autophagy in Hydrogen bacteria 04

NRT/KS/19/2889

Master of Science (M.Sc.) Semester-I (CBCS) (Microbiology) Examination

MICROBIAL METABOLISM (M.M)

Paper-I

Paper-I

Time : Three Hours]

[Maximum Marks : 80

Note :— (1) All questions are compulsory and carry equal marks.

(2) Draw diagram wherever necessary.

1. Explain biosynthesis of membrane phospholipids in detail. 16

OR

Give detailed account on animal and plant lectins. 16

2. Draw purine nucleus. Schematically explain the pathway leading to its De-nova synthesis. 16

OR

Give detailed account on protein domain and motif. Explain its role in metabolism. 16

3. Discuss in detail anoxygenic photosynthesis in non-sulfur bacteria. 16

OR

Explain oxygenic photosynthesis in cyanobacteria. 16

4. Explain in detail nitrification and denitrification process with suitable example. 16

OR

Discuss in detail symbiotic nitrogen fixation. Add a note on nitrogenase enzyme complex. 16

5. Write notes on :

(a) VPI

(b) Triplet DNA

(c) Autotrophy in hydrogen bacteria

(d) Acetogenesis. 4×4

Master of Science (M.Sc.) First Semester (CBCS) (Microbiology) Examination

MICROBIAL METABOLISM (M.M.)

Paper-1

Paper-I

Time : Three Hours]

[Maximum Marks : 80

N.B. : All questions are compulsory and carry equal marks.

1. Describe in detail Galectin A, MBP-1 and LT as informational molecules. 16
- OR
- Discuss the biosynthesis of bacterial peptidoglycan. 16
2. Describe in detail the chaperones and chaperonins and their functions. 16
- OR
- Discuss the structure of Duplex DNA and G-tetraplex orientation. 16
3. Describe in detail the anoxygenic photosynthesis in green sulphur and non-sulphur bacteria. 16
- OR
- Discuss the hydrogen oxidation and autotrophy in hydrogen bacteria. 16
4. Describe in detail the symbiotic and non-symbiotic nitrogen fixation. 16
- OR
- Discuss in detail the process of methanogenesis. 16
5. Write notes on :
- (A) Con.A 4
- (B) Alpha-helix 4
- (C) ATPase complex 4
- (D) Anammox 4

**Master of Science (M.Sc.) Microbiology Semester-I (CBCS) (NEP) Examination
MMHT01 : MICROBIAL METABOLISM**

Paper-I

Time : Three Hours]

[Maximum Marks : 80

Note :— (1) All questions are compulsory and carry equal marks.
(2) Draw diagram wherever necessary.

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| 1. Describe in detail biosynthesis of cell wall polysaccharides. | 16 |
| OR | |
| Describe in detail about viral and bacterial informational molecules. | 16 |
| 2. Describe structural details of duplex DNA. | 16 |
| OR | |
| Give detailed account on pyrimidine biosynthesis. | 16 |
| 3. Describe in detail oxygenic photosynthesis in cyanobacteria. | 16 |
| OR | |
| Describe in detail anoxygenic photosynthesis in green sulfur and purple phototrophic bacteria. | 16 |
| 4. Describe Methanogenesis. Explain a schematic pathway of methanogenesis. | 16 |
| OR | |
| (a) Explain Non-symbiotic nitrogen fixation. | 8 |
| (b) Describe mechanism of Nitrate reduction. | 8 |
| 5. Write notes on the following : | |
| (a) Steroid transformation | 4 |
| (b) Chaperones and chaperonins | 4 |
| (c) Oxidation of Reduced sulphur compound | 4 |
| (d) Nitrogenase enzyme complex. | 4 |