

Bachelor of Science (B.Sc.) Semester-III Examination
MICROBIOLOGY : CHEMISTRY OF ORGANIC CONSTITUENTS AND ENZYMOLOGY
 (New)

Optional Paper-I

Time : Three Hours]

[Maximum Marks : 50

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

1. Define Carbohydrates. Explain mono-saccharides and di-saccharide with suitable example. 10
 OR
 Write in detail the structure and nomenclature of saturated and unsaturated fatty acids with suitable example. 10
2. Describe the secondary structure of proteins with examples. 10
 OR
 Give an account of the classification of amino acids on the basis of side chain. 10
3. (a) Derive the equation of Michaelis-Menton. 5
 (b) Define Enzyme. Explain the classification system of an enzyme with suitable example. 5
 OR
 (c) Define enzyme inhibition. Explain the competitive inhibition. 5
 (d) Write about membrane bound enzymes, and zymogens with suitable examples. 5
4. (a) What are nucleotides and nucleosides ? Give their examples. 2½
 (b) Draw the well-labelled diagram of B-DNA. 2½
 (c) What are water soluble vitamins ? Explain any one of them. 2½
 (d) Write a note on Rickets. 2½
 OR
 (e) Write brief about Purines and Pyrimidines. Give their structure with examples. 2½
 (f) What is RNA ? Write briefly about t-RNA. 2½
 (g) What is hypovitaminosis ? Explain the causes and symptoms of Vitamin B12 deficiency. 2½
 (h) Explain in brief Vitamin A and its role. 2½

(Contd.)

5. Answer the following questions (any TEN) :—

- (1) Write the name of storage polysaccharides.
- (2) What is asymmetric carbon ?
- (3) What is Wax ?
- (4) What is peptide bond ?
- (5) Give any one name of tertiary protein.
- (6) What is isoelectric pH ?
- (7) What is holo enzyme ?
- (8) What is turnover number ?
- (9) What is prosthetic group ?
- (10) Write the complementary strand of :
5'CGCGTAACGCG3'
- (11) Which sugar is present in DNA ?
- (12) What is the role of ribosomal RNA ?

1×10=10

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Bachelor of Science (B.Sc.) Semester—III Examination

MICROBIOLOGY

(Chemistry of Organic Constituents and Enzymology)

Optional Paper—I

Time : Three Hours]

[Maximum Marks : 50

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

1. Write notes on :
 - (a) Structure of starch. 5
 - (b) Structure of Lecithin and Cephalin. 5

OR

 - (c) Structure of Lactose and Sucrose. 5
 - (d) Structure of Cholesterol and prostaglandins. 5
2. Classify amino acids on the basis of structure of side chain. 10

OR

Define Protein. Describe tertiary structure of protein in detail. 10
3. Derive Michaelis-Menton equation and discuss its modifications. 10

OR

Describe different types of inhibition of enzyme with suitable example. 10
4. Write short notes on :
 - (a) Hypervitaminosis 2½
 - (b) Structure of t-RNA 2½
 - (c) Hypovitaminosis of Vitamin A 2½
 - (d) Structure of ATP. 2½

OR

 - (e) z-DNA 2½
 - (f) Difference between DNA and RNA 2½
 - (g) Sources and deficiency diseases of Vitamin C 2½
 - (h) Classification of vitamins on the basis of solubility. 2½
5. Solve any **TEN** :
 - (i) What is an Osazone ? 1
 - (ii) What are triglycerides ? 1
 - (iii) Name any one heteropolysaccharide. 1
 - (iv) What are essential amino acids ? 1
 - (v) Give an example of Oligomeric protein. 1
 - (vi) Define neutral amino acid. 1
 - (vii) What is a Cofactor ? 1
 - (viii) What are Zymogens ? 1
 - (ix) Define Katal. 1
 - (x) Name any two sources of Vitamin B₁₂. 1
 - (xi) Draw the structure of Thymine. 1
 - (xii) What is the function of m-RNA ? 1

Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur
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Bachelor of Science (B.Sc.) Semester-III Examination
MICROBIOLOGY PAPER-I: CHEMISTRY OF ORGANIC
CONSTITUENTS AND ENZYMOLOGY

Time: Three Hours

(Maximum Marks: 50)

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

1. Give the classification of lipids in detail. 10

OR

Describe the structure of starch in detail and discuss the structure of osazone formation 10

2. Describe the classification of amino acids with examples. 10

OR

(a) Explain the secondary structure of protein. 5

(b) Explain titration curve. Draw the graph of titration. 5

3. Derive Michaelis and Menten equation and explain LB plot. 10

OR

(a) Write a note on non-competitive inhibition and derive the equation. 5

(b) Discuss the different classes of enzyme. 5

4. (a) Discuss the structure of different types of pyrimidines. 5

(b) Discuss the structure of t-RNA 5

OR

(a) Discuss the structure of r-RNA 2½

(b) Discuss the disease caused due to the deficiency of vit. B. 2½

(c) Explain the term hypovitaminosis with suitable example. 2½

(d) Explain the function of any one fat soluble vitamin. 2½

5. Solve any **ten** of the following: (1×10)=10

(I) What are zymogens.

(II) Define epimers.

(III) Name any two saturated fatty acids.

(IV) Define coenzymes.

(V) What is Z-DNA?

(VI) Define anomers?

(VII) What is cardiolipin?

(VIII) Name any two basic amino acids.

(IX) Define allosteric enzyme.

(X) Write disease caused by vit. C deficiency.

(XI) Draw the structure of maltose.

(XII) What is beri-beri?

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(2) Draw diagram wherever necessary.

1. Discuss the structure of starch and glycogen. 10
OR
Describe the structure of hyaluronic acid in detail and discuss the structure of osazone formation 10
2. Describe in detail the secondary structure of proteins. 10
OR
(a) Explain peptide bond theory. 5
(b) Explain titration curve. Draw the graph of titration. 5
3. (a) Define holoenzyme, apoenzyme and explain with diagram. 2½
(b) Explain enzyme code number. 2½
(c) Explain competitive inhibition. 2½
(d) Discuss the significance of LB plot. 2½
OR
(a) Write a note on multienzyme complex. 5
(b) Discuss the different classes of enzyme. 5
4. Describe the structure of B-Form of DNA. 10
OR
(a) Discuss the structure of GTP. 2½
(b) Discuss the disease caused due to the deficiency of vit. B. 2½
(c) Write a note on hypervitaminosis. 2½
(d) Give the diagrammatic structure of t-RNA. 2½
5. Solve any **ten** of the following (1x10)=10
(I) What are anomers.
(II) Define peptide bond.
(III) Name any two unsaturated fatty acids.
(IV) Define oligomeric proteins.
(V) What is meant by zymogens?
(VI) Define prosthetic group?
(VII) What is meant by katal?
(VIII) Name any two aromatic amino acids.
(IX) Define ES complex.
(X) Define nucleotides.
(XI) Define glycosidic linkage.
(XII) Differentiate between Nucleoside and Nucleotide.

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- | | |
|--|-----------|
| 1. (a) Give the classification of lipids. | 5 |
| (b) Write a note on cerebrosides and gangliosides. | 5 |
| OR | |
| Describe the structure of glycogen in detail and discuss the structure of raffinose. | 10 |
| 2. Describe the α -helical and β -pleated sheet structure of proteins. | 10 |
| OR | |
| (a) Explain peptide bond theory. | 5 |
| (b) Explain titration curve. Draw the graph of titration. | 5 |
| 3. Derive Michaelis and Menten equation and explain LB plot. | 10 |
| OR | |
| (a) Write a note on non-competitive inhibition and derive the equation. | 5 |
| (b) What are isoenzymes? Explain with suitable example. | 5 |
| 4. (a) Discuss the structure of different types of pyrimidines. | 5 |
| (b) Explain different forms of DNA. | 5 |
| OR | |
| (a) Discuss the structure of t-RNA | 2½ |
| (b) Discuss the disease caused due to the deficiency of vit. B. | 2½ |
| (c) Explain the term hypovitaminosis with suitable example. | 2½ |
| (d) Explain the function of any one water soluble vitamin. | 2½ |
| 5. Solve any ten of the following: | (1×10)=10 |
| (I) What are oligomeric proteins. | |
| (II) Define amino acids. | |
| (III) Name any two unsaturated fatty acids. | |
| (IV) Define prosthetic group. | |
| (V) What is B-DNA? | |
| (VI) Define anomers? | |
| (VII) What is cardiolipin? | |
| (VIII) Name any two acidic amino acids. | |
| (IX) Define allosteric enzyme. | |
| (X) Write disease caused by vit. C deficiency. | |
| (XI) Draw the structure of lactose. | |
| (XII) Differentiate between Deoxyribose and ribose. | |

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- (a) Explain peptide bond theory. 5
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3. Derive Michaelis and Menten equation and explain LB plot. 10
OR
(a) Write a note on non-competitive inhibition and derive the equation. 5
(b) What are isoenzymes? Explain with suitable example. 5
4. (a) Discuss the structure of different types of pyrimidines. 5
(b) Explain different forms of DNA. 5
OR
(a) Discuss the structure of t-RNA 2½
(b) Discuss the disease caused due to the deficiency of vit. B. 2½
(c) Explain the term hypovitaminosis with suitable example. 2½
(d) Explain the function of any one water soluble vitamin. 2½
5. Solve any **ten** of the following: (1×10)=10
 - (I) What are oligomeric proteins.
 - (II) Define amino acids.
 - (III) Name any two unsaturated fatty acids.
 - (IV) Define prosthetic group.
 - (V) What is B-DNA?
 - (VI) Define anomers?
 - (VII) What is cardiolipin?
 - (VIII) Name any two acidic amino acids.
 - (IX) Define allosteric enzyme.
 - (X) Write disease caused by vit. C deficiency.
 - (XI) Draw the structure of lactose.
 - (XII) Differentiate between Deoxyribose and ribose.

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