



## Karanjia Auto College, Karanjia, Mayurbhanj,

CC-7

### FUNDAMENTALS OF BIOCHEMISTRY AND MICROBIOLOGY

#### UNIT-I

Fill in the blanks

1 marks

1. Carbohydrates are also known as \_\_\_\_\_.
2. Oligosaccharides are joined together by \_\_\_\_\_ linkages.
3. The most abundant oligosaccharide is \_\_\_\_\_.
4. Non-sugars are \_\_\_\_\_.
5. A single polyhydroxy aldehyde or ketone unit is called \_\_\_\_\_.
6. The general formula of monosaccharides is \_\_\_\_\_.
7. Monosaccharides with an aldehyde group is \_\_\_\_\_.
8. Monosaccharides with a ketone group is \_\_\_\_\_.
9. \_\_\_\_\_ are simplest monosaccharides.
10. Dihydroxyacetone and glyceraldehyde are \_\_\_\_\_.
11. The total number of possible isomers of a carbohydrate is determined by \_\_\_\_\_ rule.
12. A fatty acid joined to a sphingosine via \_\_\_\_\_ linkage to form ceramide.
13. \_\_\_\_\_ is the structural parent of all sphingolipids.
14. Sphingomyelins are the major constituents of \_\_\_\_\_ tissue of higher animals.
15. \_\_\_\_\_ have a single monosaccharide linked to ceramide.
16. Accumulation of ganglioside GM2 deficiency of  $\beta$ -hexosaminidase A results in \_\_\_\_\_ disease.
17. Niemann Pick disease is due to storage of \_\_\_\_\_.

Answer the followings.

1.5/2.5marks

1. Define carbohydrates.
2. Classify carbohydrates.
3. What are aldohexose and ketohexose?
4. Write the enantiomers of glyceraldehyde.
5. What are epimers? Give an example.
6. Why D-mannose and D-galactose are not epimers?
7. How a furanose is formed?
8. What are anomers?
9. Define mutarotation with an example.
10. What are glycosides?

11. Differentiate fat and oil.
12. What is saponification?
13. Define saponification number with its importance.
14. How waxes are formed?
15. Write the components of phospholipids.
16. What are gangliosides?

Long answer questions.

6 marks

1. What are carbohydrates? Write different types of carbohydrates.
2. Write the structure and functions of polysaccharides.
3. What are lipids? Classify them and write their importance.

## UNIT-II

### Amino acids, Proteins, Immunoglobulins

Fill in the blanks

1 marks

1. Proteins are polymers of \_\_\_\_\_.
2. The 1<sup>st</sup> amino acid discovered is \_\_\_\_\_.
3. The naming of amino acids is done as per \_\_\_\_\_.
4. Asparagine was first found in \_\_\_\_\_.
5. Glutamate was 1<sup>st</sup> found in \_\_\_\_\_.
6. Tyrosine was 1<sup>st</sup> found in \_\_\_\_\_.
7. The distance between adjacent amino acids along  $\beta$ - strand is approximately \_\_\_\_\_A.
8. \_\_\_\_\_ reduces the disulphide bonds to sulfhydryl groups and breaks intra and interchain disulphide bonds.
9. The non-protein component of a conjugated protein is called \_\_\_\_\_.
10. Apoprotein with its prosthetic group is called \_\_\_\_\_.
11. The non-protein component of a glycoprotein is a \_\_\_\_\_.
12. The number of heavy chain type in an antibody is \_\_\_\_\_.
13. The number of amino acids in  $C_L$  is \_\_\_\_\_.
14. The number of amino acids in  $C_H$  is \_\_\_\_\_.
15. \_\_\_\_\_ is the secretory immunoglobulin.
16. \_\_\_\_\_ immunoglobulin is pentameric.
17. Immediate hypersensitivity is mediated by \_\_\_\_\_.

Answer the followings.

1.5/2marks

1. What are stereoisomers?
2. What are amino acids?
3. Write the structure of an amino acid.
4. What are the absolute configuration of amino acids?
5. Why glycine is not optically active?
6. What are the denaturing agents?
7. Define immunity. What are the types of immunity?
8. What are the heavy chain isotypes forming the major classes of antibodies?
9. What is the hinge region of an antibody?
10. What are membrane bound immunoglobulins?

11. What are the functions of IgG?
12. Differentiate antigen and immunogens.
13. What are the factors affecting immunogenicity?

Long answer questions.

6 marks

1. What are amino acids? Write their names and physiological importance of essential amino acids.
2. Write the bonds stabilizing protein structure.
3. What are immunoglobulins? Write the structure of immunoglobulins.
4. Write the structure and functions of different classes of immunoglobulins. **UNIT-III**

Fill in the blanks

1 marks

1. Enzymes have no role in \_\_\_\_\_ of equilibrium.
2. Enzymes entirely composed of amino acids are called \_\_\_\_\_.
3. The non-protein group of conjugated enzymes is called \_\_\_\_\_.
4. The only protein group of conjugated enzymes is called \_\_\_\_\_.
5. Thiamine pyrophosphate is a coenzyme form of vitamin \_\_\_\_\_.
6. FAD and FMN are coenzyme form of vitamin \_\_\_\_\_.
7. The coenzyme form of nicotinic acid/ niacin is \_\_\_\_\_.
8. The cofactor of pyruvate kinase is \_\_\_\_\_.
9. The cofactor of carbonic anhydrase is \_\_\_\_\_. 10. The cofactor of alcohol dehydrogenase is \_\_\_\_\_.

Answer the followings.

1.5/2.5marks

1. Define enzymes and write its features.
2. What is a holoenzyme?
3. What is a prosthetic group?
4. What are coenzymes?
5. What are the rules given by EC (Enzyme Commission) for naming an enzyme?
6. Classify the enzymes.
7. Describe EC 2 transferases.
8. Differentiate kinases and phosphorylases.
9. What are lyases?
10. What are isomerases? Give at least 2 examples.

Long answer questions.

6 marks

1. What are enzymes? Write the mechanism of enzyme action.
2. Describe enzyme kinetics.
3. Write the enzyme inhibition.
4. How enzyme action is regulated?

## UNIT-IV

Fill in the blanks

1 marks

1. Eubacteria and archaea are \_\_\_\_\_.
2. The ribosome in prokaryotes is \_\_\_\_\_.

3. The most important gene for prokaryote phylogeny is \_\_\_\_\_.
4. Carl Woese splitted \_\_\_\_\_ kingdom into the Eubacteria and the Archaea.
5. \_\_\_\_\_ is a very large sized bacteria that is visible to unaided eye.
6. The smallest known bacteria are the members of the genus \_\_\_\_\_.
7. The causative agent of anthrax is \_\_\_\_\_.
8. Corynebacterium have many shapes and is called a \_\_\_\_\_ bacteria.
9. Eosin and acid fuchsin are \_\_\_\_\_ group of dyes.
10. The Gram stain and the acid-fast stain are \_\_\_\_\_ stains.

Answer the followings.

1.5/2.5marks

1. Write the features of prokaryotes.
2. What is endosymbiont theory?
3. Why 16S rRNA is important in determining the prokaryotic phylogeny?
4. Write Carl Woese classification system.
5. Classify bacteria based on its shape.
6. Name some cationic or basic dyes.
7. What is Gram staining?
8. What are the roles of teichoic acid in bacteria cell wall?
9. What is periplasmic space?
10. What is glycocalyx?
11. Differentiate the capsule and slime layer of bacteria.

Long answer questions.

6 marks

1. Describe bacteria conjugation.
2. What is a virus? Describe its structure and classification 3. How do viruses reproduce?
4. Describe the lytic and lysogenic life cycle of bacteriophage.
5. Describe the cause, symptoms, diagnostics, treatment and prophylaxis of typhoid/cholera/ tuberculosis/ swine flue/ zika fever/ AIDS.