



BRAINWARE UNIVERSITY

Term End Examination 2019 – 20

Programme – Master of Science in Biotechnology

Course Name – Biochemistry

Course Code – MBT101

(Semester – 1)

Time allotted: 2 Hours 30 Minutes

Full Marks: 60

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group –A

(Multiple Choice Type Question)

20 x 1 = 20

1. Answer any *twenty* from the following
 - (i) Roughly how many amino acids are there in one turn of a helix?

a. 1	b. 3.6
c. 2.8	d. 4.2
 - (ii) What is an Apo enzyme?

a. Vitamin	b. Lipid
c. Carbohydrate	d. Protein
 - (iii) What is the maximum wavelength that Tryptophan and tyrosine absorb?

a. 280nm	b. 257nm
c. 260nm	d. 230nm
 - (iv) Which of the following Mucopolysaccharides is non sulfated and most abundant in tissues?

a. Hyaluronic acid	b. Keratan sulphate
c. Heparin	d. Dermatan sulphate
 - (v) Name the enzyme secreted by pancreas?

a. Pepsin	b. Chymotrypsin
c. Alcohol dehydrogenase	d. Trypsin

- (vi) Which of the following enzymes catalyzes the first step of glycolysis?
- | | |
|---------------|--------------------------|
| a. Hexokinase | b. Pyruvate kinase |
| c. Enolase | d. Phosphofructokinase-1 |
- (vii) Which of the following options is not true about secondary protein structure?
- | | |
|--|--|
| a. The hydrophilic/hydrophobic character of amino acid residues is important to secondary structure. | b. The ability of peptide bonds to form intramolecular hydrogen bonds is important to secondary structure. |
| c. The alpha helix, beta pleated sheet and beta turns are examples of protein secondary structure. | d. The steric influence of amino acid residues is important to secondary structure. |
- (viii) A structure that has hydrogen bonds between polypeptide chains arranged side by side is
- | | |
|----------------------------|-----------------------|
| a. Primary structure | b. α -helix |
| c. β -pleated sheets | d. Tertiary structure |
- (ix) Cellulose is made up of repeating units of
- | | |
|--|--|
| a. 1-4 linkage between D-glucose units | b. 1-2 linkage between D-glucose units |
| c. 1-6 linkage between D-glucose units | d. 1-3 linkage between D-glucose units |
- (x) Identify the amino acids containing nonpolar, aliphatic R groups
- | | |
|--|--------------------------------|
| a. Phenylalanine, tyrosine, and tryptophan | b. Lysine, arginine, histidine |
| c. Glycine, alanine, leucine | d. Serine, threonine, cysteine |
- (xi) Which among the following options is a non-essential amino acid?
- | | |
|--------------|--------------|
| a. Serine | b. Lysine |
| c. Threonine | d. Histidine |
- (xii) Which of the following options are known as helix breakers?
- | | |
|---------------------------|--------------|
| a. Proline | b. Valine |
| c. Isoleucine and leucine | d. Threonine |
- (xiii) In which amino acid Imidazole group, an aromatic ring found
- | | |
|-------------|--------------|
| a. Lysine | b. Histidine |
| c. Arginine | d. Glutamate |
- (xiv) The TCA cycle is an oxidative pathway requiring oxygen for operation. The enzyme which consumes oxygen during the operation of the cycle is
- | | |
|-----------------------------|---|
| a. isocitrate dehydrogenase | b. α ketoglutarate dehydrogenase |
| c. acotinase | d. none of the above |

- (xv) For which out of the following compounds cholesterol does not serve as a precursor?
- Bile pigments
 - Bile salts
 - Vitamin D
 - Sex hormones
- (xvi) Name the coenzyme of riboflavin (B2)?
- NAD or NADP
 - FAD and FMN
 - Coenzyme A
 - Thiamine pyrophosphate
- (xvii) Electron accepted from FADH₂ in electron transport chain by
- Flavin mononucleotide
 - Ubiquinone
 - Cytochrome c
 - Cytochrome a
- (xviii) Which of the following options is not a disaccharide?
- Fructose
 - Maltose
 - Lactose
 - Sucrose
- (xix) Sucrose is composed of which two sugars?
- Glucose and Glucose
 - Glucose and Fructose
 - Glucose and Galactose
 - Fructose and Galactose
- (xx) Which of the following options is not a homopolysaccharide?
- Starch
 - Heparin
 - Glycogen
 - Cellulose
- (xxi) Enzyme involved in the pathway of synthesis of acetyl-coA
- Hexokinase
 - Pyruvate decarboxylase
 - Pyruvate dehydrogenase
 - Pyruvate kinase
- (xxii) Products of glucose oxidation essential for oxidative phosphorylation are
- Pyruvate
 - Acetyl co-A
 - NADPH and ATP
 - NADH and FADH₂
- (xxiii) Biological redox reaction always involves
- an oxidizing agent
 - a gain of electrons
 - a reducing agent
 - all of these
- (xxiv) Lipid bi layer is
- hydrophilic
 - hydrophobic
 - Hydrophilic and hydrophobic
 - Depends on the surrounding media
- (xxv) The sugar molecule in a nucleotide is
- Pentose
 - Hexose
 - Tetrose
 - Triose

Group – B

(Short Answer Type Questions)

4 x 5 = 20

Answer any *four* from the following

- | | | |
|----|--|-----|
| 2. | Write a note about saturated and unsaturated fatty acids. | 5 |
| 3. | How does enzyme concentration affect enzyme activity? | 5 |
| 4. | Write a short note about on protein secondary structure. | 5 |
| 5. | Write a short note about on fate of pyruvate. | 5 |
| 6. | What is the biological hierarchy? What are the 4 major biomolecules and their building blocks? | 2+3 |
| 7. | Mucopolysaccharide structure and function. | 5 |

Group – C

(Long Answer Type Questions)

2 x 10 = 20

Answer any *two* from the following

- | | | |
|-----|---|-----|
| 8. | (a) Write a note on peripheral and integral protein of the membrane | 2+5 |
| | (b) What do cholesterol molecules do to membrane structure? | 3 |
| 9. | (a) What are the principles of metabolism? | 3 |
| | (b) Describe the metabolism of glycogen in animals | 7 |
| 10. | Describe the different level of protein structure with example | 10 |
| 11. | (a) Describe the tertiary structure of protein | 6 |
| | (b) Write a short note about on sickle cell anemia. | 4 |