Bago University
Department of Zoology
First Semester Examination, March 2019

Fourth Year BSc | **Zool.4101**
(Zoology Specialization) | **Molecular Cell Biology**
Answer ALL questions | **Time Allowed: (3) Hours**

I. State TRUE or FALSE to the following statements. **(10 marks)**

1. Simple organic molecules such as amino acids and nucleotides can associate to form polymers.
2. Protein can be intracellular signals, carrying information within the cell.
3. Animals cells, plant cells fungi and protists are prokaryotes.
4. All living organisms obtain, store and use energy to fuel their activities.
5. Biosynthetic pathways include the production of lipid membrane components.
6. Nucleic acids are the important of all biomolecules.
7. Using amino acids and the process known as protein synthesis.
8. Zymogenes are only activated at the place, where their action is desired.
9. The chief cells of the gastric mucosa secrete proenzyme pepsinogene.
10. Every enzyme has its own Enzyme commission number.

II. Complete the following statements with appropriate words. **(10 marks)**

1. Two nucleotides can join together by a ------- bond.
2. Mitochondria and chloroplasts contain their own ------- systems.
3. Single-cell organisms comprise more than half of the total ------- on earth.
4. The law of conservation of ------- states that the total amount of energy in the universe is constant.
5. Oxidation refers to the removal of -------.
6. The reactants, products and intermediates of an enzymatic reaction are known as -------.
7. Pathways are required for the maintenance of -------.
8. Kinases participate in the transfer of ------- group from ATP.
9. The enzyme is only active when the ------- is bound to it.
10. The coenzyme can be synthesized by the cell or taken up as a -------, and it can be degraded.

III. Answer ALL questions **(10 marks)**

1. Give a word diagram and equation to show the generation of metabolic energy.
2. Mention about the comparison of prokaryotic and eukaryotic cells.
3. Give diagrammatic explanation on Anabolic pathway and catabolic pathway.
4. Name the types of noncovalent bonds encountered in biological molecules.
5. Give short account on protein fold.

IV. Answer ALL questions **(20 marks)**

1. Explain the nature of hydrophilic molecule.
2. State briefly the three major roles of lipids found in cells.
3. Describe the necessary technique to determine the function and structure of proteins.
4. Give a brief explanation on isomerases.

V. Answer ANY THREE questions **(30 marks)**

1. Discuss as far as you can on carbohydrates as organic compounds in the cell.
2. Describe the nature and functions of two types of nucleic acids as found in cells.
3. Discuss the formation of phosphodiester bond with diagrammatic explanation.
4. Substantiate the state that 'the natural processes move from a state of order to a condition of randomness in the second law of thermodynamics'.
5. List the four distinct levels of protein structure and explain detail on tertiary structure.
6. Name six major classes of enzymes and explain the oxidoreductase.

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