

The Open University of Sri Lanka
 Faculty of Natural Sciences
 B.Sc/ B. Ed Degree Programme



Department	: Botany
Level	: Level 03
Name of the Examination	: Final Examination
Course Title and Code	: ORGANISATION OF CELLS AND PLANT BIOCHEMISTRY-BYU3301
Academic Year	: 2020/2021
Date	: 02. 12.2021
Time	: 09.30 a.m. -11.30 a.m.
Duration	: Two (02) Hours

General Instructions

1. Read all instructions carefully before answering the questions.
2. This paper contains six(06) questions and divided into three (03) parts (A,B and C) on 02 pages. Each part has two (02) questions.
3. You are expected to **answer four (04) questions**, selecting at **least one (01) question from each part**. All questions carry equal marks.
4. Answer to each question should commence on a new page.
5. Draw fully labelled diagrams where necessary
6. Involvement in any activity that is considered as an exam offense will lead to punishment
7. Use blue or black ink to answer the questions.
8. Clearly state your index number in your answer script

Part A

1. "Microscopy is essential for studying cells and subcellular components".
 - a. Briefly highlight the different types of microscopes with their functions and characteristics.
 - b. Describe the structure of the eukaryotic cell membrane with using appropriate illustrations
 - c. Discuss how the cell membrane facilitates transport of materials?
2.
 - a. Describe the structure and nature of genetic material in eukaryotic cells .
 - b. Briefly describe the sequence of events that occurs during the cell cycle of a eukaryotic cell .
 - c. Describe the most complicated and the longest phase of meiosis.

Part B

3.

- a. Discuss the functional significance of different types of proteins in cells.
- b. With the aid of a suitable illustration, explain how enzymes efficiently utilize the energy during biological reactions.
- c. Describe briefly how different regulatory factors affect enzyme-catalyzed reactions?

4.

Write short notes on

- a. The metabolism of stored lipids during seed germination.
- b. Compare glycolysis and the citric acid cycle.
- c. The role of different enzymes in the biological nitrogen fixation and the assimilation of the products.

Part C

5. "DNA replication is the most important process of biological inheritance".

- a. Describe the role of different enzymes involved in replicating a DNA duplex.
- b. Compare the DNA replication process of lagging and leading strands.
- c. Compare the processes of DNA replication in Prokaryotes and Eukaryotes.
- d. DNA replication occurs in a semi-conservative mode in the eukaryotes. Outline the key steps of an experiment that demonstrates semi-conservative replication.

6. "DNA encodes RNA, which in turn determines the nature of proteins"

- a. Explain the above statement with the aid of appropriate illustrations.
- b. Describe the form and function of different RNA types involved in protein synthesis.
- c. Explain how amino acids are organized in a peptide chain based on the genetic information encoded in DNA.
- d. Briefly explain the major steps carried out in the laboratory to make proteins with modified structures for industrial purposes.

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