

The Open University of Sri Lanka
Faculty of Natural Sciences
Advanced certificate in Science Programme



Department	: Foundation Academic Unit
Level	: Level 2
Name of the Examination	: Final Examination 2021/22
Course Title and - Code	: Biology 3 BYF 2513
Academic Year	: 2021/22
Date	: 17.09.2022.
Time	- 9.30 am - 12.30 pm.

General Instructions

1. Read all instructions carefully before answering the questions.
2. This question paper consists of 07 questions in 08 pages.
3. All questions carry equal marks.
4. Answer for each question should commence from 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.

Index Number :

Answers to questions in Part I should be given in the question paper itself. Answers to questions in Part II should be given in the answer book provided.

PART I (1 ½ Hours)
Multiple Choice and Structured Essay Questions
Answer ALL Questions

1) Multiple Choice Questions

Indicate the most appropriate answer with a cross (X) in the cage provided

1.1 An example of a seedless vascular plant is

a.	<input type="checkbox"/>	a.) <i>Marchantia</i> .
b.	<input type="checkbox"/>	b.) <i>Anthoceros</i> .
c.	<input type="checkbox"/>	c.) <i>Equisetum</i> .
d.	<input type="checkbox"/>	d.) <i>Cycas</i> .

1.2 Oligosaccharides are formed by

a.	<input type="checkbox"/>	a.) peptide bonds.
b.	<input type="checkbox"/>	b.) high energy bonds.
c.	<input type="checkbox"/>	c.) glycoside bonds.
d.	<input type="checkbox"/>	d.) ester bonds.

1.3 Classification of algae is based on

a.	<input type="checkbox"/>	a.) the stored food.
b.	<input type="checkbox"/>	b.) the pigments present.
c.	<input type="checkbox"/>	c.) chemical composition of the cell wall.
d.	<input type="checkbox"/>	d.) all the above features.

1.4 The stain used for the wet mount preparation of fungi is

a.	<input type="checkbox"/>	a.) Gram's stain.
b.	<input type="checkbox"/>	b.) safranine.
c.	<input type="checkbox"/>	c.) methylene blue.
d.	<input type="checkbox"/>	d.) lacto phenol cotton blue.

1.5 When inoculating a Petri plate, the inoculating loop is flamed until red hot,

a.	<input type="checkbox"/>	a.) to prevent the contamination of the plate by other organisms.
b.	<input type="checkbox"/>	b.) to make the inoculation easy.
c.	<input type="checkbox"/>	c.) to melt the agar so that microbes will spread easily.
d.	<input type="checkbox"/>	d.) for all of the above reasons.

1.6 Autoclaving is carried out for

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|----|--------------------------|---|
| a. | <input type="checkbox"/> | a.) any liquid |
| b. | <input type="checkbox"/> | b.) any liquid which is not destroyed by heating. |
| c. | <input type="checkbox"/> | c.) heat labile liquids. |
| d. | <input type="checkbox"/> | d.) sterilizing agar powder. |

1.7 When the pH of the milk is decreased,

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|----|--------------------------|--|
| a. | <input type="checkbox"/> | a.) milk proteins become less soluble. |
| b. | <input type="checkbox"/> | b.) milk proteins become more soluble. |
| c. | <input type="checkbox"/> | c.) the solution become clear. |
| d. | <input type="checkbox"/> | d.) the solution becomes red. |

1.8 Phototrophs are

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|----|--------------------------|--|
| a. | <input type="checkbox"/> | a.) organisms who use light to generate energy. |
| b. | <input type="checkbox"/> | b.) organisms who use inorganic substances to generate energy. |
| c. | <input type="checkbox"/> | c.) organisms who use organic substances to generate energy. |
| d. | <input type="checkbox"/> | d.) organisms who are unable to generate energy. |

1.9 Which of the following Statements is correct regarding innate immunity?

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|----|--------------------------|---|
| a. | <input type="checkbox"/> | a.) The individuals are born with innate immunity. |
| b. | <input type="checkbox"/> | b.) the individuals of the same species can have different innate immunities. |
| c. | <input type="checkbox"/> | c.) Age of an individual will influence one's innate immunity. |
| d. | <input type="checkbox"/> | d.) All of the above statements are correct regarding innate immunity. |

1.10 Biotechnology is mainly used in

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|----|--------------------------|------------------------------|
| a. | <input type="checkbox"/> | a.) agriculture. |
| b. | <input type="checkbox"/> | b.) food science |
| c. | <input type="checkbox"/> | c.) medicine. |
| d. | <input type="checkbox"/> | d.) all of the above fields. |

1.11 The natural penicillin

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|----|--------------------------|---|
| a. | <input type="checkbox"/> | a.) can be administered through mouth. |
| b. | <input type="checkbox"/> | b.) is destroyed by acids in the stomach and cannot be administered orally. |
| c. | <input type="checkbox"/> | c.) is converted to other types naturally. |
| d. | <input type="checkbox"/> | d.) has only narrow range of action. |

1.12 In wastewater treatment microbes are used in

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|----|--------------------------|---|
| a. | <input type="checkbox"/> | a.) primary treatment. |
| b. | <input type="checkbox"/> | b.) secondary treatment. |
| c. | <input type="checkbox"/> | c.) tertiary treatment. |
| d. | <input type="checkbox"/> | d.) all three treatments mentioned above. |

1.13 Single cell proteins

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|----|--------------------------|--|
| a. | <input type="checkbox"/> | a.) are derived from microbes. |
| b. | <input type="checkbox"/> | b.) are excellent source of food for humans. |
| c. | <input type="checkbox"/> | c.) have high content of nutrients. |
| d. | <input type="checkbox"/> | d.) have all of the above features. |

1.14 Covid 19 is caused by

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|----|--------------------------|------------------|
| a. | <input type="checkbox"/> | a.) a bacterium. |
| b. | <input type="checkbox"/> | b.) a protozoan. |
| c. | <input type="checkbox"/> | c.) a virus. |
| d. | <input type="checkbox"/> | d.) a fungus. |

1.15 In a climax community

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|----|--------------------------|---|
| a. | <input type="checkbox"/> | a.) the dominant species outgrows the others. |
| b. | <input type="checkbox"/> | b.) the vegetation is unable to tolerate the prevailing environmental conditions. |
| c. | <input type="checkbox"/> | c.) species diversity is increased. |
| d. | <input type="checkbox"/> | d.) level of competition is high. |

1.16 The traditional climatic zonation was based only on

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|----|--------------------------|-------------------------------|
| a. | <input type="checkbox"/> | a.) temperature. |
| b. | <input type="checkbox"/> | b.) rainfall |
| c. | <input type="checkbox"/> | c.) altitude. |
| d. | <input type="checkbox"/> | d.) all of the above factors. |

1.17 Human are ecologically successful because

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|----|--------------------------|---|
| a. | <input type="checkbox"/> | a.) they have anatomical and mental characters. |
| b. | <input type="checkbox"/> | b.) they have developed machinery. |
| c. | <input type="checkbox"/> | c.) they are cultivating their own food. |
| d. | <input type="checkbox"/> | d.) of all the above features. |

1.18 Vivipary is a feature developed by

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|----|--------------------------|--|
| a. | <input type="checkbox"/> | a.) seashore plants as an adaptative mechanism. |
| b. | <input type="checkbox"/> | b.) mangroves as an adaptation to saline habitats. |
| c. | <input type="checkbox"/> | c.) mangroves to assist in gaseous exchange. |
| d. | <input type="checkbox"/> | d.) seashore plants to increase photosynthetic area. |

1.19 Which of the following is incorrect regarding the ozone layer?

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|----|--------------------------|---|
| a. | <input type="checkbox"/> | a.) The ozone layer is capable of absorbing harmful UV rays. |
| b. | <input type="checkbox"/> | b.) It is made up of three bonded O atoms. |
| c. | <input type="checkbox"/> | c.) It is found in the stratosphere. |
| d. | <input type="checkbox"/> | d.) Chlorine and bromine containing substances improve the ozone layer. |

1.20 Species diversity

- | | | |
|----|--------------------------|---|
| a. | <input type="checkbox"/> | a.) is termed as the number of species in a given location. |
| b. | <input type="checkbox"/> | b.) is referred to as the abundance of species in a given location. |
| c. | <input type="checkbox"/> | c.) Both of the above would describe the species diversity. |
| d. | <input type="checkbox"/> | d.) None of the above would describe the species diversity. |

1.21 Which of the following is correct regarding the industrialization?

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|----|--------------------------|--|
| a. | <input type="checkbox"/> | a.) The industrialization has advantages as well as disadvantages. |
| b. | <input type="checkbox"/> | b.) The industrialization has not caused global warming. |
| c. | <input type="checkbox"/> | c.) The industrialization will not cause pollution. |
| d. | <input type="checkbox"/> | d.) The industrialization has no impact on the environment. |

1.22 Ex-situ conservation

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|----|--------------------------|---|
| a. | <input type="checkbox"/> | a.) will conserve the endangered species in their own habitats. |
| b. | <input type="checkbox"/> | b.) is suitable for animals which are not in large numbers. |
| c. | <input type="checkbox"/> | c.) will not protect animals against predation. |
| d. | <input type="checkbox"/> | d.) will offer a large area for animal mobility. |

1.23 An example for a non-renewable resource is

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|----|--------------------------|-----------------------|
| a. | <input type="checkbox"/> | a.) minerals |
| b. | <input type="checkbox"/> | b.) oils and gas. |
| c. | <input type="checkbox"/> | c.) coal. |
| d. | <input type="checkbox"/> | d.) all of the above. |

1.24 Which of the following statements is correct?

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|----|--------------------------|--|
| a. | <input type="checkbox"/> | a.) Rapid growth of population will have negative impact on the environment. |
| b. | <input type="checkbox"/> | b.) Improvement in health sector has led to decrease in life span of human. |
| c. | <input type="checkbox"/> | c.) Rapid increase in population does not lead to deforestation. |
| d. | <input type="checkbox"/> | d.) Landfills will improve the environment. |

1.25 Select the most suitable statement regarding biodiversity in Sri Lanka.

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|----|--------------------------|---|
| a. | <input type="checkbox"/> | a.) Sri Lanka is famous for its high biodiversity. |
| b. | <input type="checkbox"/> | b.) One of the factors which has led to high biodiversity is climate. |
| c. | <input type="checkbox"/> | c.) Human habitation has contributed for loss of biodiversity. |
| d. | <input type="checkbox"/> | d.) All of the above statements are correct. |

(100 Marks).

2.) Structured Essay Question

2 a) Based on what climatic conditions is Sri Lanka divided into climatic zones?

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b) What are these climatic zones?

i) ii).....

c) Name the two major monsoonal rains experienced by Sri Lanka.

i) ii).....

d) Out of the above mentioned in c) which monsoonal rain will provide rain to the whole country? Give reasons.

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e) Does global warming have an impact on Sri Lanka? If your answer is yes, list five major impacts with reasons for them.

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f) Describe five negative impacts of climate change on human lives.

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(100 marks)



Part II

Essay Type Questions (1 ½ hours)

Answer any three (03) questions in the answer book provided. Each question will carry 100 marks.

- 1.a) What is bioremediation?
 - b) Explain briefly the two types of bioremediation methods.
 - c) Describe how you can attack oil spills from ships on beaches.
 - d) In addition to bioremediation, explain in which way the microbes are used in waste treatment.
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- 2.a) What are the major ecological processes taking place in a wetland?
 - b) List the three broad categories of wetlands.
 - c) Give a brief description of the services provided by wetlands, with one example of a wetland which contributes for each service.
 - d) Explain why rice fields are considered as seasonal, temporary and man-made wetlands.
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- 3.a) List three N fixing cyanobacteria. Mention the special feature present in them which enable them to fix N.
 - b) Describe why cyanobacteria are considered as prokaryotes.
 - c) What are the major differences between green algae and blue green algae?
 - d) Draw a thallus of *Ulva* and label fully.
 - e) Name the type of stored food present in the cells of *Ulva* and explain how you would test for the presence of the compounds.
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- 4.a) Briefly describe a type of biotechnological application used in biodiversity conservation.
 - b) Explain how this process would replace the seeds which are not viable.
 - c) 'Biotechnology contributes to improve the human life.' With examples discuss this statement.
 - d) 'Biotechnology has its disadvantages too.' Briefly explain this.
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- 5) Write short notes on any three (03) of the following.
 - a.) Impacts of deforestation
 - b.) Principle of Gram's staining and the procedure
 - c.) Methods of food preservation
 - d.) Adaptations of mangrove plants.
 - e.) Tropical rain forests

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