

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 2024/25
Course Title and - Code	: Biology 3 BYF 2513
Academic Year	: 2024/25
Date	: 13.10.2024.
Time	: 9.30am-12.30pm
Duration	: 03 Hours

General Instructions

1. Read all instructions carefully before answering the questions.
2. This question paper consists of **07** questions in **07** 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>Nephrolepis</i> .
d.	<input type="checkbox"/>	d.) <i>Pinus</i> .

1.2 An example of a macro biomolecule is,

a.	<input type="checkbox"/>	a.) protein
b.	<input type="checkbox"/>	b.) starch.
c.	<input type="checkbox"/>	c.) both of the above molecules.
d.	<input type="checkbox"/>	d.) none of the above molecules.

1.3 Which of the following species is important in maintaining the balance of an ecosystem?

a.	<input type="checkbox"/>	a.) an endemic species
b.	<input type="checkbox"/>	b.) a migratory species.
c.	<input type="checkbox"/>	c.) both of the above species.
d.	<input type="checkbox"/>	d.) none of the above species.

1.4 Which of the compounds given below, will not produce a positive reaction with the KI/I₂ reagent?

a.	<input type="checkbox"/>	a.) protein
b.	<input type="checkbox"/>	b.) coconut oil.
c.	<input type="checkbox"/>	c.) both of the above molecules.
d.	<input type="checkbox"/>	d.) none of the above molecules.

1.5 The group of plants which invaded the land first is,

a.	<input type="checkbox"/>	a.) bryophyta.
b.	<input type="checkbox"/>	b.) pteridophyta.
c.	<input type="checkbox"/>	c.) coniferophyta.
d.	<input type="checkbox"/>	d.) cycadophyta.

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

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|----|--------------------------|---|
| 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. |

1.7 Species diversity

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|----|--------------------------|---|
| 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. |

1.8 Saprophytic organisms obtain their Carbon,

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|----|--------------------------|--------------------------------|
| a. | <input type="checkbox"/> | a.) as CO ₂ |
| b. | <input type="checkbox"/> | b.) as organic forms. |
| c. | <input type="checkbox"/> | c.) in the form of Carbon. |
| d. | <input type="checkbox"/> | d.) by all of the above forms. |

1.9 Gram's staining is a technique,

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|----|--------------------------|---|
| a. | <input type="checkbox"/> | a.) which differentiates between the cocci and bacilli. |
| b. | <input type="checkbox"/> | b.) which differentiates between cocci and vibrio. |
| c. | <input type="checkbox"/> | c.) which differentiates between spirillum and bacilli. |
| d. | <input type="checkbox"/> | d.) which cannot differentiate between any of the above bacteria. |

1.10 The submerged plants,

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|----|--------------------------|---|
| a. | <input type="checkbox"/> | a.) obtain the mechanical strength from the water in the environment. |
| b. | <input type="checkbox"/> | b.) possess mechanical tissues. |
| c. | <input type="checkbox"/> | c.) have collenchymatous tissues. |
| d. | <input type="checkbox"/> | d.) have sclerenchyma tissue in the body. |

1.11 A natural medium which is used to culture bacteria is

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|----|--------------------------|------------------------------|
| a. | <input type="checkbox"/> | a.) potato dextrose agar. |
| b. | <input type="checkbox"/> | b.) starch agar. |
| c. | <input type="checkbox"/> | c.) nutrient agar. |
| d. | <input type="checkbox"/> | d.) none of the above media. |

1.12 Which of the following statements is correct?

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|----|--------------------------|--|
| a. | <input type="checkbox"/> | a.) microorganisms are not used in industries. |
| b. | <input type="checkbox"/> | b.) biotechnology does not use microorganisms. |
| c. | <input type="checkbox"/> | c.) all the organisms used in antibiotic production are aerobes. |
| d. | <input type="checkbox"/> | d.) none of the above statements are correct. |

1.13 A difference between *Marchantia* and *Pogonatum* sporophyte is

a.		a.) <i>Pogonatum</i> sporophyte has a special mode of dispersal of spores.
b.		b.) <i>Pogonatum</i> sporophyte is photosynthetic but <i>Marchantia</i> is not.
c.		c.) <i>Marchantia</i> produces elaters in the sporophyte but not <i>Pogonatum</i> .
d.		d.) All of the above differences are correct.

1.14 In biotechnology,

a.		a.) only microbes are used,
b.		b.) only higher plants are used.
c.		c.) organisms are used at cellular level.
d.		d.) none of the above statements are correct.

1.15 Bioremediation uses microorganisms to remove toxic pollutants by,

a.		a.) degradation.
b.		b.) assimilation.
c.		c.) transportation.
d.		d.) all of the above methods.

1.16 Bio fertilizers are,

a.		a.) ecofriendly and cost effective.
b.		b.) expensive.
c.		c.) causes environmental pollution.
d.		d.) not used to improve yield.

1.17 Environmental sustainability,

a.		a.) has been maintained by human in the world today.
b.		b.) will not ensure needs of population.
c.		c.) will not use resources sustainably.
d.		d.) avoids depletion of natural resources.

1.18 Ex-situ conservation

a.		a.) will conserve the endangered species in their own habitats.
b.		b.) is suitable for animals which are not in large numbers.
c.		c.) will not protect animals against predators.
d.		d.) will offer a large area for animal mobility.

1.19 Sri Lanka is known worldwide for the great diversity of habitats because of,

a.		a.) different soil types.
b.		b.) the climatic variations.
c.		c.) the physiography.
d.		d.) of all the above conditions.

1.20 Forests are important ecosystems because

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|----|--|--|
| a. | | a.) they remove CO ₂ from the atmosphere. |
| b. | | b.) they provide food for the human. |
| c. | | c.) they play a key role in water cycle. |
| d. | | d.) of all of the above reasons. |

1.21 Which of the following statements is correct?

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

1.22 Streak plate method

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|----|--|--|
| a. | | a.) can be used to isolate bacteria only |
| b. | | b.) can be used to isolate fungi only. |
| c. | | c.) can be used to isolate fungi and bacteria. |
| d. | | d.) none of the above statements are correct. |

1.23 Spermatophytes include,

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|----|--|--|
| a. | | a.) both bryophytes and pteridophytes. |
| b. | | b.) both gymnosperms and angiosperms, |
| c. | | c.) all of the above plants. |
| d. | | d.) none of the above plants. |

1.24 The vegetative state of fungi is known as,

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|----|--|-------------------|
| a. | | a.) mycelia. |
| b. | | b.) cilia. |
| c. | | c.) flagella. |
| d. | | d.) conidiospore. |

1.25 Major functions of mangroves include,

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|----|--|---|
| a. | | a.) mitigation of floods. |
| b. | | b.) prevention of coastal erosion. |
| c. | | c.) providing breeding habitats for fish. |
| d. | | d.) all of the above. |

(100 Marks)

2.) Structured Essay Question

2a.) What is meant by 'ex-situ conservation'?

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b.) If a scientist wants to conserve an important plant which is endangered, what type of conservation should he use?

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c.) Give three (03) reasons for the answer in b.)

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d.) Give two (02) examples for places in Sri Lanka where the type of conservation you mentioned in b) is found

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e) List five (05) differences between ex-situ and in-situ conservation of animals.

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f) 'In-situ conservation offers better environment for the evolution of animals.' Discuss this statement.

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Part II

Essay Type Questions (1 ½ hours)

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

- 1a.) Define 'biotechnology'.
 - b.) Describe contribution made by biotechnology towards the biodiversity protection.
 - c.) 'Biotechnology has its advantages and disadvantages.' Discuss this statement.
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- 2a) List three N fixing cyanobacteria. Mention the special feature present and the enzyme 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 this compound.
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- 3a.) Name four (04) sea shore plants.
 - b.) Describe the conditions under which the sea shore plants live.
 - c.) Compare the environmental conditions of the sea shore plants with those of salt marsh plants.
 - d) 'The seashore plants are adapted to live successfully under harsh conditions.' Discuss this statement.
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- 4a.) Why is it necessary to preserve food?
 - b.) Explain how food is preserved using temperature.
 - c.) What will happen when food is contaminated? Explain the illnesses caused by the presence of undesirable microbes in food.
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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.) Species Diversity
 - d.) Mangrove plants
 - e) Diseases caused by microorganisms

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