

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 2023/24
Course Title and - Code	: Biology 1 BYF 2511
Academic Year	: 2023/24
Date	: 27.08.2023.
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 **08** pages.
- 3.. All questions carry equal marks.
4. Answer for each question should commence from a new page.
5. Draw fully labeled 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. An example of a nyctinastic movement is

a.	
b.	
c.	
d.	

- a.) response of a plant to touch.
 b.) movement of bacteria towards gravity.
 c.) movement of higher plants in response to onset of darkness.
 d.) growth of a plant due to a mechanical stimulus.

2. Which of the following is not a function of ethylene?

a.	
b.	
c.	
d.	

- a.) Release dormancy.
 b.) Fruit ripening.
 c.) Induction of adventitious root formation.
 d.) Inhibition of shoot growth.

3. Growth of a plant cannot be described as

a.	
b.	
c.	
d.	

- a.) an increase in size of cells.
 b.) an increase in number of cells by cell division.
 c.) specialization of structure and function of cells.
 d.) fruit abscission.

4. Soft wood

a.	
b.	
c.	
d.	

- a.) is found in angiosperms.
 b.) has vessels.
 c.) have low percentage of fibres.
 d.) is softer than hard wood.

5. Cork cambium is formed by

a.	
b.	
c.	
d.	

- a.) peripheral layers of cortical cells.
 b.) cells in the periderm.
 c.) cells in the epidermis.
 d.) the phelloderm.

6. Macro-nutrients of a tissue culture medium are,

a.	
b.	
c.	
d.	

- a.) required in large quantities.
- b.) required in small quantities.
- c.) not essential for the growth of the explant.
- d.) important for the solidification of the medium.

7. Which of the following is not a function of the gene therapy?

a.	
b.	
c.	
d.	

- a.) Inactivating a mutated gene.
- b.) Introducing a new gene into the body of a patient.
- c.) Treating a patient with a surgery.
- d.) Replacing a mutated gene with a healthy copy.

8. If a mother with an AB blood group and father with a B blood group give birth to a child, possible blood group of the child could be,

a.	
b.	
c.	
d.	

- a.) A.
- b.) B.
- c.) AB.
- d.) Any of the above blood groups.

9. Mendel's second law can be applied to

a.	
b.	
c.	
d.	

- a.) a monohybrid cross.
- b.) a dihybrid cross.
- c.) lethal genes.
- d.) genes exhibiting incomplete dominance.

10. An important organophosphate is,

a.	
b.	
c.	
d.	

- a.) phosphagen.
- b.) Acetyl Co A.
- c.) active methionine.
- d.) acetyl carrier protein.

11. Which of the following is not essential for a reaction of an enzyme?

a.	
b.	
c.	
d.	

- a.) Presence of a substrate.
- b.) Presence of an enzyme.
- c.) Presence of a co-factor.
- d.) All of the above are essential.

12. A difference between mitosis and meiosis is,

a.	
b.	
c.	
d.	

- a.) mitosis produces two daughter cells while meiosis produces four.
 b.) in mitosis the chromosome number is not reduced while in meiosis it is halved.
 c.) mitosis occurs in somatic cells while meiosis occurs in reproductive cells.
 d.) All the above statements are correct.

13. The organisms that are able to carry out both aerobic and anaerobic respiration depending on the environment are,

a.	
b.	
c.	
d.	

- a.) cells of a virus.
 b.) yeast cells.
 c.) algal cells.
 d.) cells of archaebacteria.

14.) The primary substrate used in glycolysis is,

a.	
b.	
c.	
d.	

- a.) glucose.
 b.) pyruvate.
 c.) lactate.
 d.) glyceraldehyde.

15. In C₄ plants the initial CO₂ fixation is catalyzed by,

a.	
b.	
c.	
d.	

- a.) RuBP Carboxylase.
 b.) PEP Carboxylase.
 c.) Oxalo acetic acid.
 d.) Phospho-glyceraldehyde.

16. The stage that yields ATP in fermentation is,

a.	
b.	
c.	
d.	

- a.) glycolysis.
 b.) recycling stage.
 c.) Kreb's cycle
 d.) electron transport chain.

17. Identification of a plant specimen can be done by,

a.	
b.	
c.	
d.	

- a.) asking an expert.
 b.) comparison with another specimens
 c.) using a taxonomic key.
 d.) one or more methods mentioned above.

18. The mechanical classification system was based on,

a.	
b.	
c.	
d.	

- a.) habit of plants.
 b.) one or a few characters of plants.
 c.) as many characters of plants as possible.
 d.) many characters and phylogenetic relationships of plants.

19. A genus is described as,

a.		a.) closely related species in a group.
b.		b.) closely related families.
c.		c.) closely related orders.
d.		d.) closely related classes.

20. Viruses are considered as separate group from other organisms because,

a.		a.) they are extremely small.
b.		b.) they are infectious agents.
c.		c.) they can replicate only within a living host.
d.		d.) all the above characters.

21. The organisms which lack mitochondria are

a.		a.) bacteria and cyanobacteria.
b.		b.) green and blue green algae.
c.		c.) fungi and green algae.
d.		d.) green and red algae.

22. Tuberculosis is caused by,

a.		a.) a virus.
b.		b.) a bacterium.
c.		c.) a fungus.
d.		d.) an insect.

23. an example of a marine and green thalloid alga is

a.		a.) <i>Spirogyra</i> .
b.		b.) <i>Ulva</i> .
c.		c.) <i>Chlorella</i> .
d.		d.) <i>Pandorina</i> .

24. Lichens are,

a.		a.) not eaten by animals.
b.		b.) cannot live under harsh conditions.
c.		c.) important for soil formation on bare rocks.
d.		d.) symbiotic association between fungi and roots of higher plants.

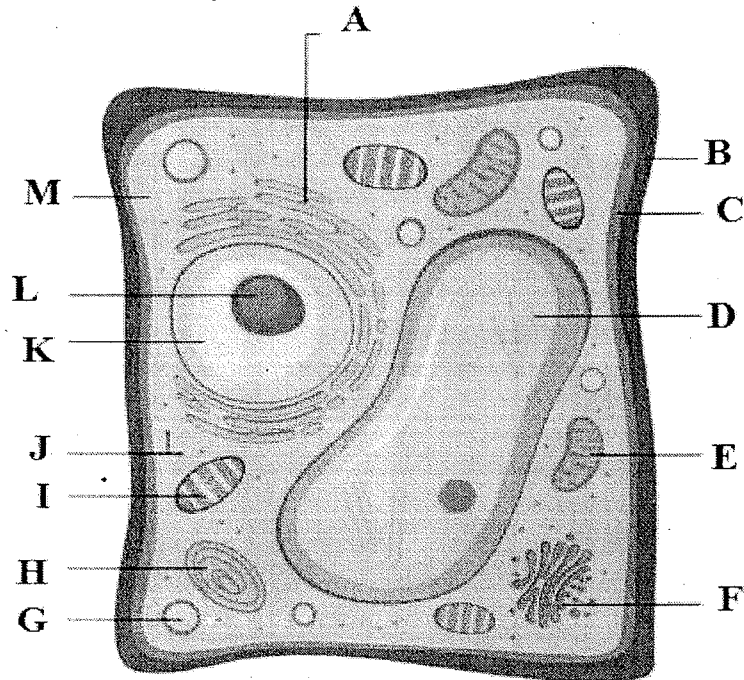
25. Bryophyta never grow tall because, they do not have

a.		a.) a vascular system.
b.		b.) lignin biosynthesis ability.
c.		c.) a root system.
d.		d.) stomata.

(100 marks)

Part B

2. Structured Essay Question



Given above is a plant cell.

a) Label all the parts.

A..... B.....
 C..... D.....
 E..... F.....
 G..... H.....
 I..... J.....
 K..... L.....
 M.....

b) Give one function of each of these structures.

A.....
 B.....
 C.....
 D.....
 E.....

F.....

G.....

H.....

I.....

J.....

K.....

L.....

M.....

c) List three (03) differences between the above cell and a bacterial cell.

i)

ii)

iii)

d) Explain the reasons for the above mentioned differences.

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e) If a plant cell and a red blood cell are placed in beakers with water separately, describe what the results will be.

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f) Give reasons for the above phenomenon.

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(100 Marks)

Part II – Essay Type Questions (1 ½ hours)**Answer any three (3) questions using the answer book provided.**

- 1a) Describe Mendel's first law.
 - b) With an example explain why incomplete dominance deviates from Mendel's laws.
When true breeding plants with red and yellow flowers were crossed, the F₁ generation produced plants with red flowers.
 - c) What will be the F₂ genotypic and phenotypic ratios?
 - d) Explain the following crosses using suitable symbols.
 - i) Red flowered plants X Red flowered plants
 - ii) Red flowered plants X Yellow flowered plants
 - iii) Yellow flowered plants X Yellow flowered plants
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- 2a) What is seed dormancy?
 - b) What are the advantages of seed dormancy?
 - c) If you want to break the dormancy of a seed, describe the steps that you would follow.
 - d) Some plant hormones affect seed germination. Explain how this happens.
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- 3a) Describe vegetative propagation and its advantages.
 - b) Does vegetative propagation have its disadvantages? If your answer is yes, explain them.
 - c) 'Underground stems are considered as propagules of natural vegetative propagation.' Comment on this statement briefly describing the structure of the underground stems and their advantages to the plant. (Use suitable drawings where necessary.)
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- 4a) Draw a line diagram of a transverse section of a primary dicot stem and label all the tissues.
 - b) List the functions of the tissues that you labeled.
 - c) Mention the tissues that undergo changes in the formation of the secondary structure of a dicot stem and briefly describe how the formation of the secondary structure takes place.
 - d) Differentiate between the sap wood and the heart wood.
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- 5) Write short notes on any three (3) of the following.
 - a) Lethal genes
 - b) Importance of fungi
 - c) Functional diversity of proteins
 - d) Suitability of leaf structure for photosynthesis
 - e) Basic procedures in micro-propagation

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