

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



0101

Department	: Foundation Academic Unit
Level	: Level 2
Name of the Examination	: Final Examination 2024/25
Course Title and - Code	: Biology 1 BYF 2511
Academic Year	: 2024/25
Date	: 12.10.2024.
Time	: 1.30-4.30 pm
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 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 The phototrophs can be defined as the organisms,

a.	
b.	
c.	
d.	

- a.) with the ability of synthesizing their carbon food.
- b.) synthesizing the carbon food using the energy of sunlight.
- c.) synthesizing the carbon food using the energy of a chemical reaction.
- d.) obtaining the carbon food from other sources.

1.2 Which of the following phyto-hormones is responsible for breaking seed dormancy?

a.	
b.	
c.	
d.	

- a.) Auxins
- b.) Gibberellins
- c.) Absciscic acid
- d.) cytokinines

1.3 *Lycopodium*

a.	
b.	
c.	
d.	

- a.) has a dichotomously branched heterophyllous sporophyte.
- b.) produces ligules.
- c.) is homosporous.
- d.) does not have any of the above characteristics.

1.4. A difference between *Marchantia* and *Pogonatum* sporophytes is

a.	
b.	
c.	
d.	

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

1.5 According to the fluid mosaic model of the plasma membrane,

a.	
b.	
c.	
d.	

- a.) lipids and proteins are not mobile.
- b.) lipids and proteins can move laterally.
- c.) lipids and proteins can move from one layer to another.
- d.) proteins can move while lipids are immobile.

1.6 The osmosis **cannot** be described as,

a.	
b.	
c.	
d.	

- a.) a passive process.
- b.) a process which requires energy.
- c.) a diffusion process through a selective permeable membrane.
- d.) a process in which only the solvent will diffuse.

The questions 17-19 are based on the data given below.

Tall tomato plants are produced by a dominant allele T while dwarf plants are produced by its recessive allele t. Red fruits are produced by a dominant gene R and yellow fruits by its recessive allele r. When two tall tomato plants having red fruits were crossed, the progeny produced 912 tall plants having red fruits, 306 tall plants with yellow fruits, 301 dwarf plants with red fruits and 101 dwarf plants having yellow fruits.

1.7 What type of a cross is this?

a.	
b.	
c.	
d.	

- a.) A dihybrid cross.
- b.) A monohybrid cross.
- c.) A test cross.
- d.) None of the above

1.8 What is the F_1 phenotypic ratio?

a.	
b.	
c.	
d.	

- a.) 3:1
- b.) 3:3:3:1
- c.) 9:3:3:1
- d.) 1:1:1:1

1.9 If the tall plants having red fruits in this cross were test crossed, what would be the resultant phenotypic ratio?

a.	
b.	
c.	
d.	

- a.) 1:1
- b.) 3:3:3:1
- c.) 9:3:3:1
- d.) 1:1:1:1

1.10 If the temperature is increased, in an enzymatic reaction

a.	
b.	
c.	
d.	

- a.) the reaction rate would be increased exponentially.
- b.) the reaction rate would be increased and then decreased.
- c.) the rate would be decreased.
- d.) the rate would remain at a constant.

1.11 Studying Genetics can be done through

a.	
b.	
c.	
d.	

- a.) transmission of characters only
- b.) cytological, molecular and biochemical analysis only.
- c.) studying genetic structure of populations only.
- d.) all the above methods.

1.12 An example of a derived protein is

a.	a.) histones.
b.	b.) hemoglobin.
c.	c.) peptides.
d.	d.) high density lipoproteins

1.13 The most important carbohydrate found in our food is

a.	a.) starch.
b.	b.) glucose.
c.	c.) fructose.
d.	d.) maltose.

1.14 What is the role of hormones in plant tissue culture?

a.	a.) Preventing contamination.
b.	b.) Facilitating growth and multiplication of the explant.
c.	c.) Providing sterile conditions.
d.	d.) Acting as Carbon sources.

1.15 The force which helps upward movement of water in a tall plant is,

a.	a.) adhesion and cohesion
b.	b.) transpiration pull.
c.	c.) capillarity.
d.	d.) all the above forces.

1.16 The mitochondria of a cell,

a.	a.) is the site of respiration.
b.	b.) is the site of photosynthesis.
c.	c.) is the site of protein synthesis,
d.	d.) assembles ribosomes.

1.17 The vegetative methods of plant propagation includes,

a.	a.) by cuttings.
b.	b.) by grafting.
c.	c.) by tissue culture
d.	d.) by all the above methods.

1.18 An example of a plant having a corm is,

a.	a.) <i>Allium cepa</i>
b.	b.) <i>Colocasia</i>
c.	c.) <i>Zingiber officinale</i>
d.	d.) <i>Solanum tuberosum</i>

1.19 The modern system of nomenclature was first introduced by

a.	
b.	
c.	
d.	

- a.) Darwin.
- b.) Linnaeus.
- c.) Woes.
- d.) Whittaker.

1.20 Which of the following statements is correct regarding photoperiodism?

a.	
b.	
c.	
d.	

- a.) It is a reaction of a plant to the length of day or night.
- b.) Phytochromes are induced in this.
- c.) It is clearly described by the above two statements.
- d.) It is not described by the statements a and b.

1.21 If a farmer wants to obtain fruits from unpollinated flowers of tomatoes,

a.	
b.	
c.	
d.	

- a.) he should use ethylene.
- b.) he should use cytokinines
- c.) he should use auxins
- d.) he should use Absciscic acid.

1.22 Select the correct statement regarding growth rings.

a.	
b.	
c.	
d.	

- a.) They are found only in plants growing in tropical areas.
- b.) They are more prominent in plants growing in tropical areas
- c.) They are more prominent in plants growing in temperate countries.
- d.) They are not prominent in plants growing in temperate countries.

1.23 When a plant is kept horizontally, the shoot will grow vertically. The phenomenon which causes is,

a.	
b.	
c.	
d.	

- a.) phototropism.
- b.) geotropism.
- c.) thigmotropism
- d.) thigmonastism.

1.24 In meiosis, crossing over of chromosomes occurs in

a.	
b.	
c.	
d.	

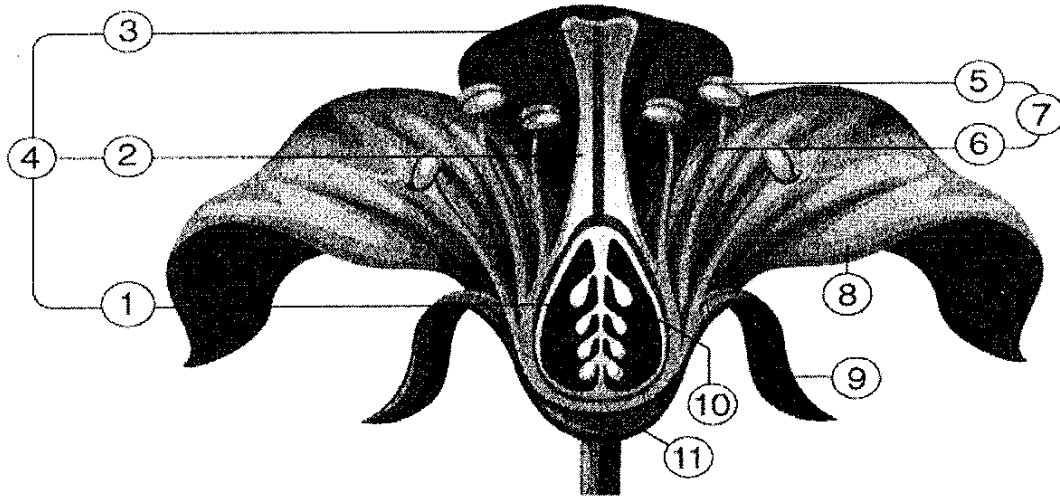
- a.) prophase.
- b.) metaphase.
- c.) anaphase.
- d.) telophase.

1.25 Fruits dispersed by wind

a.	
b.	
c.	
d.	

- a.) are colourful
- b.) have sweet taste.
- c.) are light in weight.
- d.) possess hooks and spines.

Structured Essay Question



2a) Identify the diagram given above.

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b) Name the parts 1-11.

1..... 2.....

3..... 4.....

5..... 6.....

7..... 8.....,

9..... 10.....

11.....

c) Give one (01) function of each of the above parts.

1.....

2.....

3.....

5.....

6.....

8.....

9.....

10.....

11.....

d) Which part of the flower will form the fruit?

.....

e) Give two (02) adaptations shown by flowers which are pollinated by animals.

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f) List two (02) adaptations by which plants ensure cross pollination

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g) What is the importance of cross pollination?

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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.

- 1) a) Draw a line diagram of a transverse section of a monocot leaf and label all the tissues.
- b) Briefly describe the functions of each tissue you mentioned in a) above.
- c) Compare this structure with a transverse section of a dicot leaf.

- 2a) What are thigmotrophic movements?
- b) What type of plants show this phenomenon?
- c) In what way does this phenomenon help plant growth?
- d) How do these movements occur in the plants?

- 3a) Draw a labeled diagram of a compound microscope.
- b) Give functions of each of the parts you labeled above.
- c) How does this microscope differ from a phase contrast microscope?
- d) What are the special features of the dark field microscope?

4) When a red-flowered plant was crossed with a white-flowered plant, the F₁ generation produced plants with pink flowers.

- a) What is this phenomenon?
- b) Using suitable symbols, explain the above cross.
- c) What will be the F₂ genotypic and phenotypic ratios?
- d) Give phenotypic ratios of the crosses between the following plants.
 - i) Red x Red
 - ii) White x White
 - iii) Red x Pink
 - iv) White x Pink

5) Write short notes on any three (03) of the following.

- a) Importance of fungi
- b) Advantages and disadvantages of tissue culture
- c) Enzyme inhibition
- d) Miller and Urey experiment
- e) Mitosis

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