

THE OPEN UNIVERSITY OF SRI LANKA
FOUNDATION IN SCIENCE AND ENGINEERING
BZF 2207 BIOLOGY I
DURATION THREE (03) HOURS



FINAL EXAMINATION 2016/17

INDEX NUMBER:

Date : 15.10.2017.

Time :9.30a.m.-12.30p.m.

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.

Total No. of Questions in Part I - 02

Total No. of Questions in Part II -05

No. of pages – 08

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

Part A – Multiple Choice Questions

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

1.1) The xylem tissue is considered as a complex tissue because,

a.	<input type="checkbox"/>	a.) it acts as a water conducting tissue.
b.	<input type="checkbox"/>	b.) it provides mechanical strength to the plant.
c.	<input type="checkbox"/>	c.) it has many cells.
d.	<input type="checkbox"/>	d.) it is composed of many different types of cells.

1.2) The plasma membrane separates

a.	<input type="checkbox"/>	a.) cytoplasm from cell wall.
b.	<input type="checkbox"/>	b.) cytoplasm from vacuole.
c.	<input type="checkbox"/>	c.) vacuole from cell wall.
d.	<input type="checkbox"/>	d.) cytoplasm from nucleus.

1.3) Rooting in stem cuttings can be induced artificially by

a.	<input type="checkbox"/>	a.) ethylene.
b.	<input type="checkbox"/>	b.) auxins.
c.	<input type="checkbox"/>	c.) gibberellic acid.
d.	<input type="checkbox"/>	d.) abscisic acid.

1.4) An example of a fruit/seed dispersed by wind is

a	a.) <i>Mangifera indica</i> .
b	b.) <i>Pisum sativum</i> .
c	c.) <i>Cocos nucifera</i> .
d	d.) <i>Dipterocarpus</i> .

1.5) Which of the following is **true** regarding Carbon cycle?

a	a.) It is a non-gaseous cycle.
b	b.) It can be regarded as an unimportant cycle to life on earth.
c	c.) It is disturbed mostly by human activities.
d	d.) It occurs in one direction.

Answer the questions 1.6 and 1.7 based on the data given below.

When two heterozygous yellow mice were crossed, the F₁ progeny produced only two yellow mice and one black mouse.

1.6) What is the phenomenon shown by this cross?

a	a.) Incomplete dominance.
b	b.) Gene linkage.
c	c.) Lethal genes.
d	d.) Co-dominance.

1.7) What would be the genotype of the one quarter (1/4) portion of the mice not produced in the F₁ generation if Y represents the yellow colour?

a	a.) YY.
b	b.) Yy.
c	c.) yy.
d	d.) none of the above.

1.8) What is the first stable product of C₃ photosynthesis?

a	a.) Pyruvic acid.
b	b.) Maleic acid.
c	c.) Oxalo acetic acid.
d	d.) Phosphoglyceric acid.

1.9) Which of the following is **not** a function of proteins?

a	a.) biocatalysis.
b	b.) serving as a thermal insulator.
c	c.) transport of various compounds.
d	d.) regulation of physiological functions.

1.10) Short day plants flower

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|----|--|--|
| a. | | a.) when the day length is longer than the critical day length. |
| b. | | b.) irrespective of day length. |
| c. | | c.) when night period is interrupted by a brief period of light. |
| d. | | d.) when the day length is shorter than the critical day length. |

1.11) The plant which shows isomorphic alternation of generation is

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|----|--|--------------------------|
| a. | | a.) <i>Nephrolepis</i> . |
| b. | | b.) <i>Pogonatum</i> . |
| c. | | c.) <i>Ulva</i> . |
| d. | | d.) <i>Cycas</i> . |

1.12) A plant cell without a nucleus is a

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|----|--|-----------------------|
| a. | | a.) sieve tube cell. |
| b. | | b.) parenchyma cell. |
| c. | | c.) collenchyma cell. |
| d. | | d.) root hair. |

1.13) Dormancy

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|----|--|---|
| a. | | a.) is the inactive period of seeds prior to germination. |
| b. | | b.) can be induced by external factors. |
| c. | | c.) Both of the above statements are correct. |
| d. | | d.) None of the above statements are correct. |

1.14) The symbiotic association between fungi and root of a higher plant is called

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|----|--|-----------------------|
| a. | | a.) a lichen. |
| b. | | b.) a mycorrhiza. |
| c. | | c.) a coralloid root. |
| d. | | d.) a basidium. |

1.15) Which of the following is **false** regarding DNA?

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|----|--|--|
| a. | | a.) It is responsible for protein synthesis. |
| b. | | b.) Uracil is a base present in DNA. |
| c. | | c.) It transfers characters from generation to generation. |
| d. | | d.) DNA is found in mitochondria and chloroplasts as well. |

1.16) Coniferous forests

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|----|--|--|
| a. | | a.) have no seasonal variations. |
| b. | | b.) are dominated by grasses. |
| c. | | c.) are populated by a large number of plants and animals. |
| d. | | d.) are also called Boreal forests. |

1.17) Diseases transmitted by water

a	a.) are caused by viruses.
b	b.) cannot be controlled.
c	c.) spread fast.
d	d.) affect only a small number of people.

1.18) The innermost circle of a female flower is called

a	a.) sepals.
b	b.) petals
c	c.) androecium.
d	d.) gynoecium.

1.19) A plant which shows a thigmonastic movement is

a	a.) <i>Phyllanthus emblica</i>
b	b.) <i>Mimosa pudica</i>
c	c.) <i>Tamarindus indicus</i>
d	d.) <i>Phaseolus vulgaris</i>

1.20) The end product of glycolysis is

a	a.) Acetyl CoA
b	b.) ATP
c	c.) Pyruvic Acid
d	d.) Ethyl Alcohol

1.21) A monocot stem has

a	a.) undifferentiated ground tissue.
b	b.) closed vascular bundles.
c	c.) a large number of vascular bundles scattered all over.
d	d.) all of the above features.

1.22) A protein with a carbohydrate group is referred to as a

a	a.) glycoprotein.
b	b.) lipoprotein.
c	c.) nucleoprotein.
d	d.) phosphoprotein.

1.23) The viscosity of water helps plants in

a	a.) absorption of water.
b	b.) photosynthesis.
c	c.) transpiration.
d	d.) upward movement of water.

1.24) An example of a modified root is

a.	a.) a prop root in <i>Ficus</i> .
b.	b.) a root in <i>Allium sativum</i> .
c.	c.) a tap root in <i>Mangifera indica</i> ,
d.	d.) fibrous roots in <i>Oryza sativa</i> .

1.25) Which of the following is a similarity between *Lycopodium* and *Selaginella*?

a.	a.) In both the dominant phase is the gametophyte.
b.	b.) Both show heterophylly.
c.	c.) Both are homosporous.
d.	d.) Both produce mega spores.

(50 Mins)

Part B-Structured Essay Question

2. a.) What are single-cell proteins?

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b.) Give **four (04)** advantages of production of single-cell proteins.

i).....

ii).....

iii).....

iv).....

c.) How would you describe a mushroom scientifically?

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d.) Name **two (02)** uses of fungi.

i).....

ii).....

e.) List **two (02)** bacteria used in bio-technology.

i).....

ii).....

f.) Bacteria can be harmful sometimes. List **two (02)** harmful effects of bacteria.

i).....

ii).....

g.) What are bio-fertilizers?

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h.) 'Bio-fertilizers help protect the environment.' Comment on this statement.

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(40 Mins)

Part II

Essay Type Questions (1 ½ hours)

Answer any **three (03)** questions in the answer book provided.

- 1.a.) Draw a typical dicotyledonous plant and label all the parts.
- b.) In addition to tendrils, what are the adaptations shown by plants for climbing?
- c.) With the aid of fully labelled diagrams, describe the different structures modified to form tendrils.

- 2 a) What is transpiration?
- b) Name the structures through which this process occurs.
- c) List the factors that affect transpiration and briefly describe how these factors affect this process.
- d) Differentiate between transpiration and guttation.

- 3.) When two plants with red flowers were crossed, the following progeny was obtained.

Plants with red flowers 132

Plants with yellow flowers 33

Based on the above data, answer the following questions.

- a.) What are the dominant and recessive traits?
- b.) What are the genotypes of the parental plants?
- c.) Using appropriate symbols diagram the above cross.
- d.) Give the phenotypic ratios of the crosses given below.

- i) Red X Red
- ii) Red X White
- iii) White X white

- 4 a) What are enzymes?
- b) What is enzyme inhibition?
- c) Explain the different types of enzyme inhibition.
- d) 'Organisms are benefitted by having enzymes within them.' Discuss this statement.

- 5) Write short notes on any **three (03)** of the following.
 - a) Nitrogen cycle
 - b) Tropical rain forests
 - c) I^Y structure of a cross section of a dicotyledonous stem
 - d) Glycolysis
 - e) Viruses