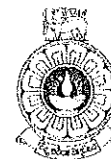


THE OPEN UNIVERSITY OF SRI LANKA
CREDIT CERTIFICATE FOR FOUNDATION IN SCIENCE
BZF 1501 BIOLOGY I
FINAL EXAMINATION 2018/19



DURATION THREE (03) HOURS

INDEX NUMBER:

Date : 23.06.2019.

Time :1.30pm. to 4.30pm.

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 - 07

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

a	<input type="checkbox"/>	a.) serving as a thermal insulator.
b	<input type="checkbox"/>	b.) inheritance of characters in organisms.
c	<input type="checkbox"/>	c.) transport of various compounds.
d	<input type="checkbox"/>	d.) holding the skeletal elements together.

1.2) Which of the methods given below is used to measure the rate of photosynthesis?

a	<input type="checkbox"/>	a.) harvest method.
b	<input type="checkbox"/>	b.) gas exchange method.
c	<input type="checkbox"/>	c.) both of the above methods.
d	<input type="checkbox"/>	d.) none of the methods given in a and b.

1.3) The autotrophs can be defined as the organisms,

a	<input type="checkbox"/>	a.) with the ability of synthesizing their carbon food.
b	<input type="checkbox"/>	b.) synthesizing the carbon food using the energy of sunlight.
c	<input type="checkbox"/>	c.) synthesizing the carbon food using the energy of a chemical reaction.
d	<input type="checkbox"/>	d.) obtaining the carbon food from other sources.

1.4) Enzymes are formed with amino acids by,

a	
b	
c	
d	

- a.) glycosidic bonds.
 b.) peptide bonds.
 c.) high energy bonds.
 d.) ester bonds.

1.5) When two characters are involved in a cross, such a cross is known as,

a	
b	
c	
d	

- a.) a monohybrid cross.
 b.) a test cross.
 c.) a back cross.
 d.) a dihybrid cross.

1.6) Chromosomes are categorized based on

a	
b	
c	
d	

- a.) the relative length of the chromosome.
 b.) the position of the centromere.
 c.) both of the above criteria.
 d.) none of the above criteria given in a and b.

1.7) 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.

1.8) In 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.) they can move from one layer to another.
 d.) proteins can move while lipids are immobile.

1.9) The advantage of the phase contrast microscope is that,

a	
b	
c	
d	

- a.) the specimen can be enlarged 40,000 times.
 b.) it is useful for viewing suspension of bacteria.
 c.) it avoids requirement of the cells to be stained or killed.
 d.) the specimen need not be sectioned.

1.10) A virus can be regarded as living because,

a	
b	
c	
d	

- a.) they possess RNA or DNA.
 b.) they can multiply extracellularly.
 c.) they have a protoplasm.
 d.) of all the above features.

1.11) A prokaryotic cell will possess,

a		a.) a golgi complex.
b		b.) an endoplasmic reticulum
c		c.) flagella.
d		d.) cilia.

1.12) Which of the following statements is **incorrect** regarding intra-cellular signaling?

a		a.) Cells change their behaviour in response to internal and external changes.
b		b.) Water stress in plants would induce uptake of K^+ into guard cells of stomata.
c		c.) Cell stimulation can change the concentration of intra-cellular solutes.
d		d.) One of the most important intra-cellular messengers is Mg^{2+} .

1.13) A cell wall,

a		a.) is present in all organisms.
b		b.) is always made up of cellulose.
c		c.) is elastic and extensible in growing plant cells.
d		d.) is always optically isotropic.

1.14) Which of the following statements is **incorrect** regarding phospholipids?

a		a.) They are present in large amounts in brain.
b		b.) They are composed of an alcohol and a fatty acid.
c		c.) They are not found in heart.
d		d.) They are a type of a compound lipid.

1.15) The enzymes that catalyzes an addition or a removal of a water molecule are called

a		a.) hydrolases.
b		b.) oxidases.
c		c.) desmolases.
d		d.) ligases.

1.16) Sub unit vaccines

a		a.) produce only partial immunity.
b		b.) contain a specific subunit of a protein from the pathogenic microorganism.
c		c.) are not successful against diseases.
d		d.) are developed with killed microorganisms.

1.17) Noncompetitive inhibitors

a		a.) slow down the reaction rate.
b		b.) change the shape of the active site.
c		c.) either the statement a or b is correct.
d		d.) both the statements a and b are correct.

1.18) Select the **correct** statement regarding human blood groups

a	
b	
c	
d	

- a.) A child with the blood group 'O' cannot be born to parents with blood group 'A'.
 b.) A child with the blood group 'A' cannot be born to parents with blood group 'O'.
 c.) Inheritance of human blood groups follows Mendel's laws.
 d.) There are only two alleles involved in the human blood groups.

1.19) The dark reaction of photosynthesis

a	
b	
c	
d	

- a.) is dependent on the light reaction.
 b.) occurs at night.
 c.) occurs on the lamellae of the chloroplasts
 d.) produces ATP and NADPH.

1.20) Cellular respiration

a	
b	
c	
d	

- a.) occurs in all organisms.
 b.) releases energy trapped in the bonds of glucose molecules.
 c.) is a process which produces energy for survival of the organisms.
 d.) requires steady supply of glucose.

1.21) Function of the Golgi body is

a	
b	
c	
d	

- a.) collection and packaging of molecules.
 b.) distribution of molecules.
 c.) both the functions of a and b.
 d.) none of the above functions.

1.22) If a leaf cell of a particular plant has 10 pairs of chromosomes, a microspore will contain

a	
b	
c	
d	

- a.) 5 chromosomes.
 b.) 10 chromosomes.
 c.) 15 chromosomes.
 d.) 20 chromosomes.

1.23) Cellulose is a polymer of

a	
b	
c	
d	

- a.) amino acids.
 b.) lipids.
 c.) glucose.
 d.) starch.

1.24) Which of the following would yield the highest amount of energy in respiration?

a	
b	
c	
d	

- a.) Citric acid.
 b.) Sucrose.
 c.) Pyruvic acid
 d.) Oxaloacetic acid

1.25) In eukaryotic cells, in addition to nucleus, DNA could be seen in

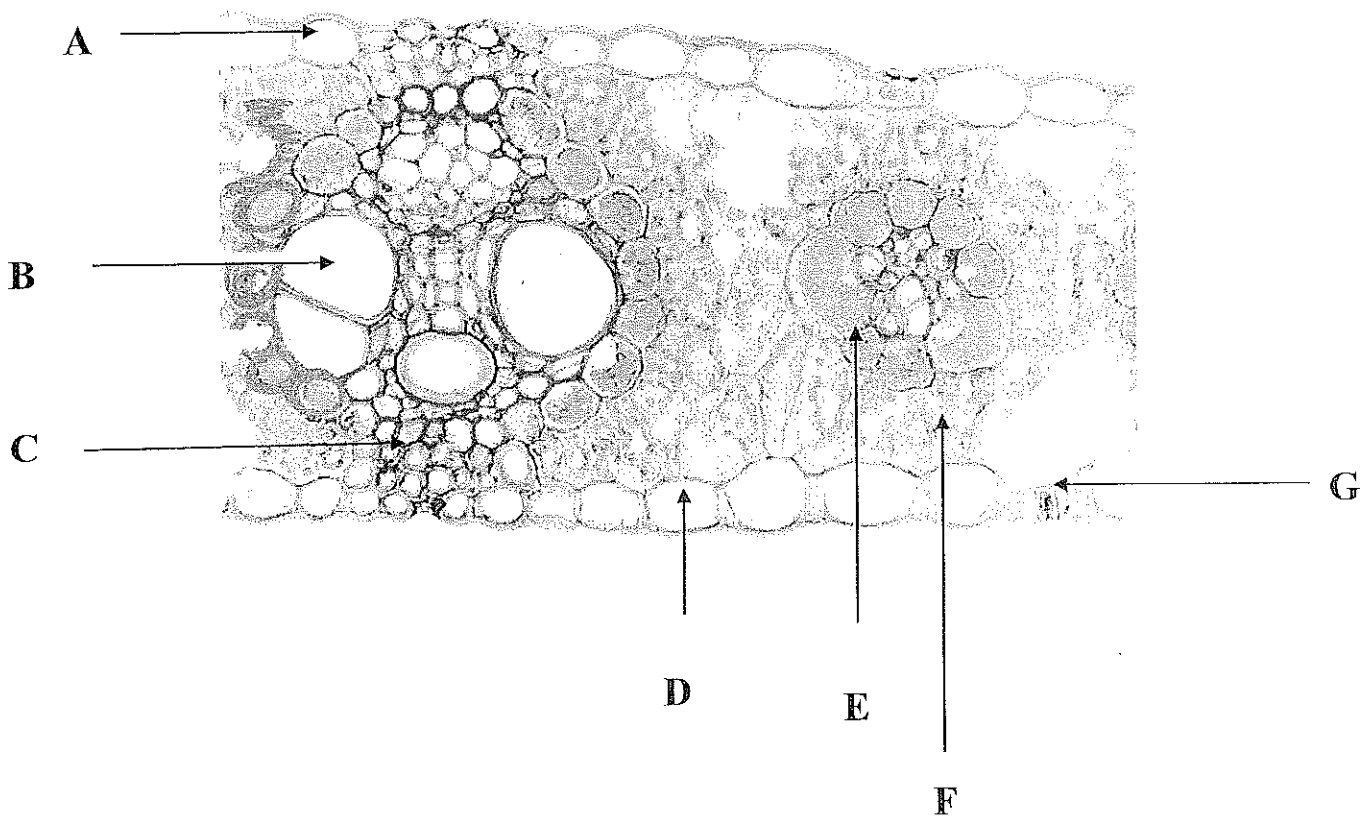
a	
b	
c	
d	

- a.) ribosomes and centrioles.
- b.) glyoxisomes and endoplasmic reticulum.
- c.) microbodies and golgi bodies.
- d.) mitochondria and chloroplasts.

(50 Mins)

Part B-Structured Essay Question

2)



a) Given above is a transverse section of a leaf. Identify the specimen fully.

.....

b) Give two (02) special features of this specimen which helped you identify it.

i).....

ii).....

c) Name A, B, C, D, E, F and G.

A-..... B-.....

C-..... D-.....

E-..... F-.....

G-.....

d) What is the special name given to the type of anatomy shown by the leaf given in the diagram?

.....

e) Name and briefly describe the major pathway of CO₂ fixation found in plants.

.....
.....
.....
.....
.....

(40 mins)

Part II**Essay Type Questions (1 ½ hours)**

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

- 1 a) What are enzymes?
 - b) Explain briefly the theories proposed to describe the action of enzymes.
 - c) How would you relate these theories to noncompetitive inhibition?
 - d) 'Organisms are benefitted by having enzymes within them.' Discuss this statement.

- 2) Tall tomato plant is produced by a dominant allele D while dwarf plant is produced by its recessive allele d. 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 910 tall plants having red fruits, 303 tall plants with yellow fruits, 294 dwarf plants with red fruits and 32 dwarf plants having yellow fruits.
 - a) Diagram the cross to show the genotypes and phenotypes of the parents and the F₁ generation.
 - b) What is the F₁ phenotypic ratio?
 - c) Show the test cross of parent plants giving the phenotypic and genotypic ratios.

- 3 a) What are proteins?
 - b) List the broad categories of proteins? Briefly describe these categories.
 - c) Differentiate between glycoproteins and lipoproteins.
 - d) 'Proteins are involved in many biological functions.' Discuss this statement giving examples.

- 4 a) What is mitosis?
 - b) Describe the stages of mitosis with suitable diagrams.
 - c) Compare mitosis with meiosis.
 - d) Explain how genetic variability in organisms occurs with meiosis.

- 5) Write short notes on **any three (03)** of the following.
 - a) Incipient plasmolysis
 - b) Mitochondria
 - c) Molecular biotechnology and agriculture
 - d) Incomplete dominance
 - e) Bacterial cell

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