

SUPPLEMENTARY EXAMINATION (UNIT1-6)

JANUARY 2020

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Moderator: Prof C van Dyk

TOTAL 150 – (3 Hours)

QUESTION 1

[18]

Choose the alternative that best completes the statement or answers the question. *Only write down the correct CAPITAL letter next to the appropriate question number.*

1.1 Which association is incorrect?

- | | |
|-----------------------|----------------------|
| a. Protein – Trypsin. | c. Maltose – Pepsin. |
| b. Fat – Lipase. | d. Starch – Amylase. |

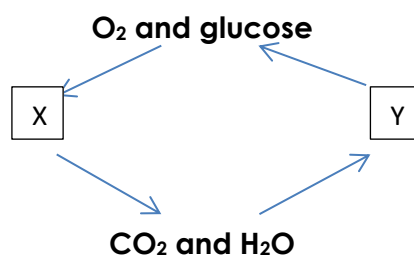
1.2 Most of the absorption of the products of digestion takes place in humans across the:

- | | |
|--|--|
| a. squamous epithelium of the esophagus. | c. finger-like villi of the small intestine. |
| b. convoluted walls of the stomach. | d. smooth wall of the large intestine. |

1.3 Bile in humans:

- | | |
|--|----------------------|
| a. is an important enzyme for the digestion of fats. | c. emulsifies fats. |
| b. is made by the gall bladder. | d. all of the above. |

Question 1.4 and 1.5 is based on the diagram below:



1.4 Which of the following processes is represented by X and Y?

	X	Y
a.	Respiration	Photosynthesis
b.	Transpiration	Photosynthesis
c.	Photosynthesis	Respiration
d.	Photosynthesis	Transpiration

1.5 Energy ____

- a. is produced by both X and Y.
- b. is produced by X and released by Y.
- c. is produced by Y and released by X.
- d. is not involved in these processes.

1.6 Which one (1) of the following substances will show an increase in concentration in the muscle cells during excessive exercise?

- a. Energy.
- b. Lactic acid.
- c. Oxygen.
- d. Carbon dioxide.

1.7 Which of the following events occurs during inhalation in the human body?

- a. the muscles of the stomach contract.
- b. the diaphragm returns to its convex position.
- c. the intercostal muscles relax.
- d. the volume of the thoracic cavity increases.

1.8 The best description of gaseous exchange in the lung, is the diffusion of:

- a. carbon dioxide into the alveoli.
- b. oxygen only, into and out of the blood.
- c. oxygen into the alveoli and carbon dioxide into the blood.
- d. oxygen into the blood and carbon dioxide into the alveoli.

1.9 Which of the following shows the correct path of air movement during exhalation?

- a. alveolus → bronchus → bronchiole → trachea
- b. alveolus → bronchiole → bronchus → trachea
- c. trachea → bronchus → bronchiole → alveolus
- d. bronchiole → bronchus → alveolus → trachea

1.10 The place in which an organism lives is called its:

- a. habitat.
- b. niche.
- c. ecosystem.
- d. community.

1.11 Decomposers:

- a. are secondary consumers.
- b. produce their own organic food.
- c. do not form part of food chains.
- d. feed on dead organic matter.

1.12 In a natural food chain there are always more:

- a. predators than primary consumers.
- b. secondary consumers than primary consumers.
- c. producers than primary consumers.
- d. tertiary consumers than secondary consumers.

1.13 Classical languages (Latin and ancient Greek) are used for biological nomenclature because:

- a. scientists want to confuse people.
- b. everybody can speak these languages.
- c. biologists around the world can understand what organism the name refers to, regardless of the language they speak.
- d. they sound better than modern languages.

1.14 Aristotle was a Greek philosopher who formulated the:

- a. binomial nomenclature.
- b. two (2) kingdom system.
- c. proposed adding a third (3rd) kingdom.
- d. proposed adding a forth (4th) domain.

1.15 Robert Whittaker:

- a. formulated the two (2) kingdom system.
- b. formulated the binomial nomenclature.
- c. Expanded the classification system to five (5) kingdoms.
- d. Expanded the classification system to three (3) domains.

1.16 Evidence from radiometric dating indicates that the Earth is about

- a. 2856 billion years old.
- b. 4.570 million years old.
- c. 2000 years old.
- d. 4.570 billion years old.

1.17 The second largest of the five (5) major extinctions in Earth's history

- a. Ordovician–Silurian extinction event.
- b. Permian–Triassic extinction event.
- c. Late Devonian extinction.
- d. Triassic–Jurassic extinction event.

1.18 the Cretaceous period and the Paleocene period is defined by the Cretaceous–Tertiary extinction event, which denotes the end of the

- a. birds.
- b. bacteria.
- c. dinosaurs.
- d. reptiles.

QUESTION 2

[18]

Give the correct biological term for each of the following statements. **Only write down the correct term next to the appropriate question number on the answer sheet.**

2.1 The liquid secreted by glands in the mouth responsible for the formation of a bolus.

- 2.2 The enzyme found in the mouth responsible for breaking down cooked starch into maltose.
 - 2.3 The use of gastric juices to breakdown food particles into smaller molecules.
 - 2.4 The glycolytic degradation of carbohydrates in the absence of free oxygen that gives rise to the production of lactic acid in animal cells.
 - 2.5 The process whereby glucose is converted to pyruvate.
 - 2.6 The chemical energy that is needed immediately for functions to take place in cells.
 - 2.7 The instrument used to measure lung capacity.
 - 2.8 The disease of the lungs when alveoli are filled with pus and fluid.
 - 2.9 The molecule that forms when some carbon dioxide is transported by hemoglobin.
 - 2.10 A group of individuals of the same species.
 - 2.11 The process by which organic substances are produced from inorganic substances in the presence of light and chlorophyll.
 - 2.12 A series of linked food chains in an ecosystem.
 - 2.13 The highest category in the hierarchical system of classification, for example Animalia.
 - 2.14 Organisms in which the cells do have a true nucleus.
 - 2.15 The scientist who proposed 2 groups of prokaryotes after researching the rRNA
 - 2.16 The Swedish Botanist who developed a method of classifying organisms properly.
 - 2.17 Provides a system of chronologic measurement relating to time that is used by earth scientist's e.g geologists to describe the timing and relationships between events that have occurred during the history of the earth.
 - 2.18 This law states that the older layer lies underneath the younger layer in undisturbed contexts.
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QUESTION 3

[12]

Provide a short definition for each of the following:

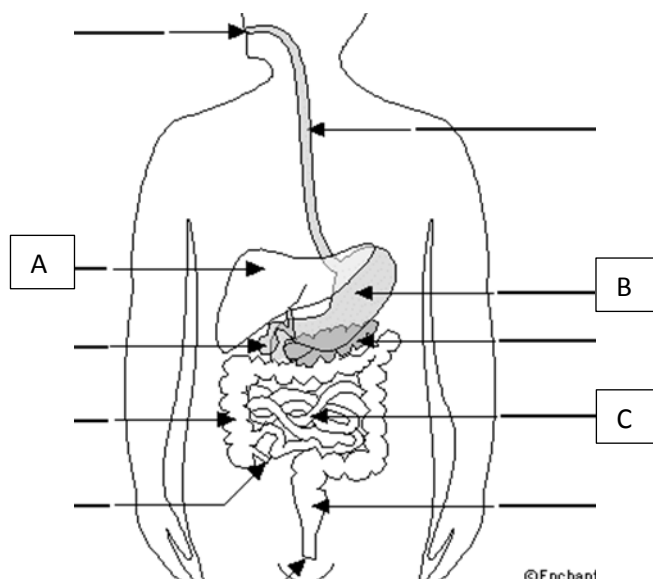
- 3.1 Digestion
- 3.2 Ingestion
- 3.3 Mechanical digestion
- 3.4 Anaerobic respiration

- 3.5 Alcoholic fermentation
- 3.6 ATP molecule
- 3.7 Abiotic organism
- 3.8 Biodegradable
- 3.9 Invader plants
- 3.10 Ernest Heackel
- 3.11 Fossil dating
- 3.12 Petrification

QUESTION 4

[17]

4. Study the diagram below and answer the questions that follow.

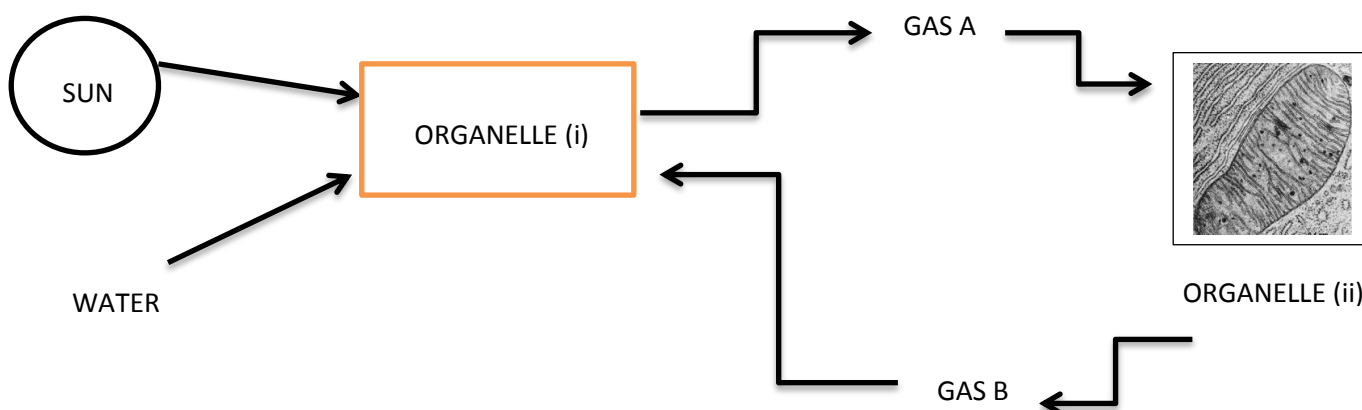


- 4.1 List the three (3) sections in which organ B is divided into. (3)
- 4.2 The first section of the organ labelled B secretes a specific juice. List the three (3) enzymes present in this juice. (3)
- 4.3 Discuss the blood supply of the organ labelled A. (6)
- 4.4 The organ labelled C contains two (2) types of glands that secrete a specific substance. Name the two (2) glands as well as the substance that they secrete. (3)
- 4.5 List the two (2) molecules into which broken down amino acids can be converted to. (2)

QUESTION 5

[17]

- 5.1 Provide the diagrammatic representation of the second phase of cellular respiration. (15 x ½ = 7½)
- 5.2 Name the two (2) other phases that respiration consists of. (2)
- 5.3 Two (2) organelles in the green parts of plants are responsible for different but closely related processes. Study the diagram below and then answer the questions that follow.



- 5.3.1 Name the organelles marked (i) and (ii) in the diagram above. (2)
- 5.3.2 Name the gases indicated by (A) and (B) in the diagram above. (2)
- 5.3.3 Name the processes that takes place in organelle (i) and organelle (ii) respectively. (2)
- 5.3.4 How many end product molecules will be formed during the process in organelle (ii)? (1)
- 5.3.5 What type of liquid is formed during the last phase of the process taking place in organelle (ii)? (½)

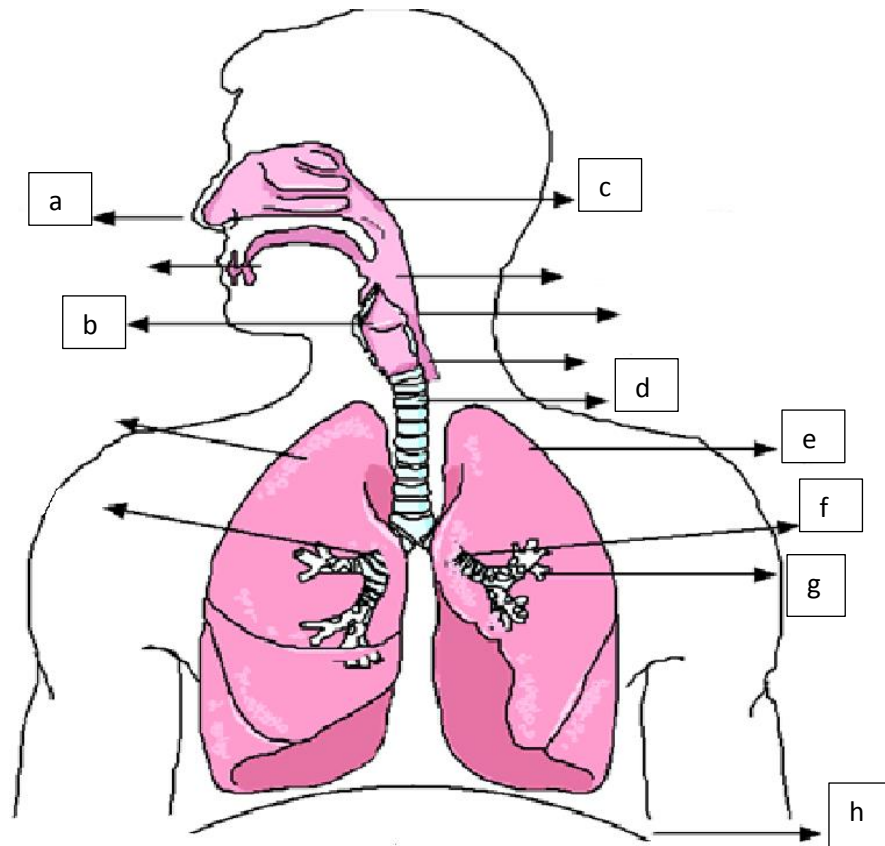
QUESTION 6

[17]

- 6.1 Write down the letter of the description in column B that fits the term in Column A. (6)

Column A	Column B
6.1 Haemoglobin.	a. Movement of air into and out of the lungs.
6.2 Tissue fluid.	b. Separating the thoracic cavity from abdominal cavity.
6.3 Ventilation.	c. Transports oxygenated blood.
6.4 Pulmonary artery.	d. Tube strengthened by O-shaped cartilaginous rings.
6.5 Bronchus.	e. Muscles between ribs.
6.6 Diaphragm.	f. Liquid surrounding body cells.
	g. Tube strengthened by C-shaped cartilaginous rings.
	h. Pigment transporting both O ₂ and CO ₂
	i. Transports blood rich in carbon dioxide.

- 6.2 Provide the labels for the diagram below of the respiratory system in the human body. (8 x ½ = 4)

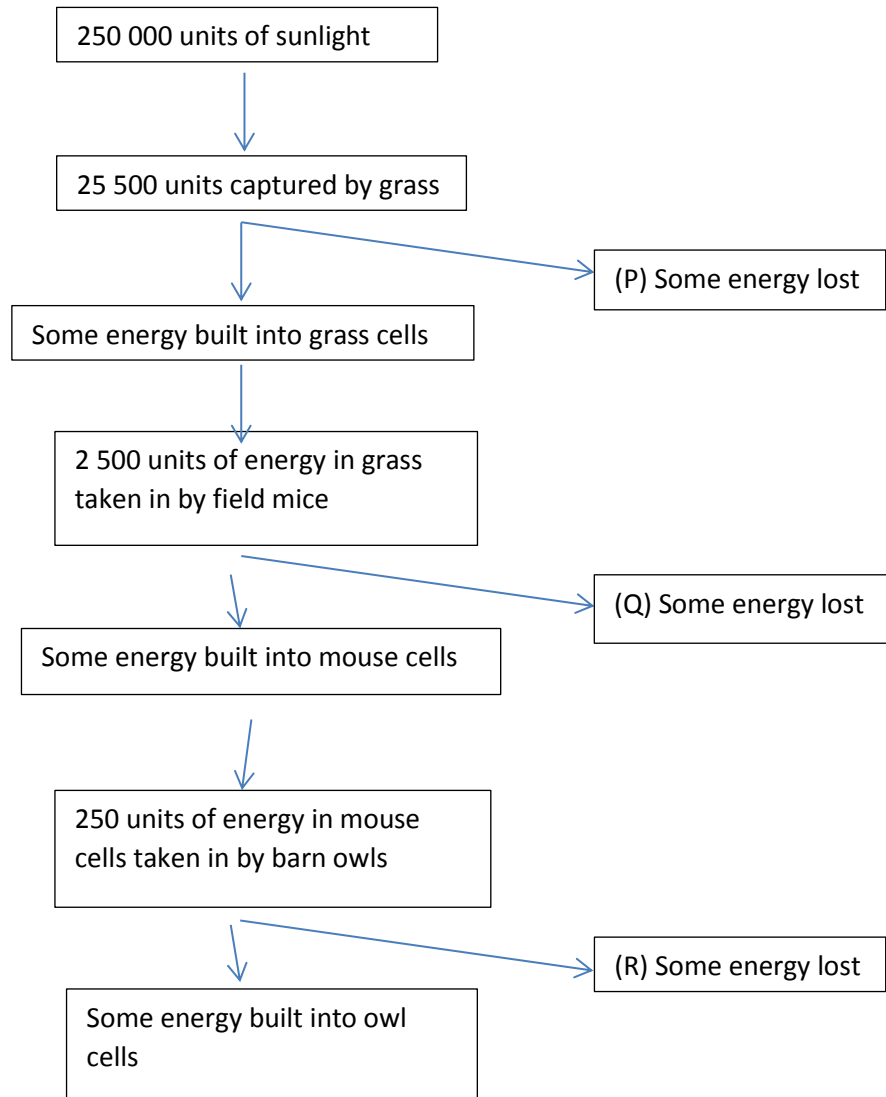


- 6.3 Explain how the respiratory center in the brain controls normal breathing. (8 x ½ = 4)
- 6.4 List the names and molecular formula for the two (2) molecules that form when carbon dioxide is transported in the blood of vertebrates. (3)

QUESTION 7

[17]

7.1 Study the following diagram and then answer the questions based on it:



- 7.1.1 Calculate the percentage of sunlight energy that was captured by the grass. (4)
- 7.1.2 Calculate the percentage of energy that was lost between "intake of energy in grass by field mice" and "intake of energy in mouse cells by barn owls". (4)
- 7.1.3 Loss of energy occurred at points P, Q and R in the diagram. At which point(s) was energy lost as undigested food and passed as faeces? (2)
- 7.2 Discuss the Grassland biome according to annual rainfall, plant –animal species present and average temperature. (4)

7.3 Name the adaptations of animals to temperature changes that you have studied. (3)

QUESTION 8

[16]

8.1 The following names of some southern African organisms are correctly spelt. Some of the names have mistakes in the way that they are written.

8.1.1 Decide which names need to be rewritten to follow the correct pattern of the binomial system.

Write down only the correctly written name next to the original wrong name.

(5)

Bubo capensis

ASIO Capensis

Tyto capensis

Buhrinus Capensis

mehelya capensis

Thelotornis CAPENSIS

Oleo capensis

Alsophila Capensis

8.1.2 Why are the names that you have rewritten in question 8.1.1, correct? (3)

8.2 Write down the letter of the example in column B that fits the term in column A. (5)

Column A	Column B
8.2.1 Monera	a. Yeast
8.2.2 Plantae	b. Amoeba, Euglena
8.2.3 Protista	c. Bacteria
8.2.4 Anamalia	d. Grass
8.2.5 Fungi	e. Lion

8.3 The following questions are about Carolus Linnaeus. (3)

8.3.1 Who was Carolus Linnaeus?

8.3.2 What did he develop?

8.3.3 What did he base this system on?

QUESTION 9

[18]

9.1 Discuss the law of superposition. (4)

9.2.1 Discuss the process of relative dating of fossils. (3)

9.2.2 Name one (1) other process that could be used to determine the date of fossils. (1)

- 9.3 Name two (2) other radiometric dating techniques. (2)
- 9.4 Discuss the formation of mineralised fossils. (8)
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TOTAL 150