UNIVERSITY OF JOHANNESBURG

FACULTY OF SCIENCE

DEPARTMENT OF BOTANY AND BIOTECHNOLOGY

LS1BFET

LIFE SCIENCE 1B FOR FET TEACHERS

APK CAMPUS

SUPPLEMENTARY EXAM

2 DECEMBER 2014

SESSION:	**08H0 – 11H00**
ASSESSOR:	**Ms E PRETORIUS**
INTERNAL MODERATOR	**MRS. J. WILLIAMSON**
DURATION:	**3 HOURS**
TOTAL MARKS:	**150**

NUMBER OF PAGES: 10 PAGES

Please read the following instructions carefully:

1. Answer all the questions in the question paper.
2. Answer ALL of the questions in the test book.
3. **Answer QUESTION 1 in CAPITAL LETTERS!**
4. **Work neatly.**
5. Read your questions carefully.
6. Good Luck.

QUESTION 1 **[18]**

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

1.1 The blood vessels that transports glucose to the liver after being absorbed in the small intestine is the:

a) Hepatic vein.
b) Hepatic artery.
c) Hepatic portal vein.
d) Thoracic duct.

1.2 The products of digestion are:

a) Large macromolecules needed by the body.
b) Small nutrient molecules that can be absorbed.
c) Enzymes needed to digest food.
d) Regulatory hormones of various kinds.

1.3 The most common nutrient digested in the stomach is:

a) Carbohydrates.
b) Protein.
c) Fat.
d) Vitamins.

1.4 Which one (1) of the following occurs in both aerobic and anaerobic respiration?

a) Carbon dioxide is used.
b) Carbon dioxide and water are released.
c) Energy is released from food.
d) Both processes are the reverse of photosynthesis.

1.5 Cellular respiration takes place:

a) during the day in plant cells only.
b) all the time in both plant and animal cells.
c) during the day and the night in animal cells only.
d) all the time in animal cells only.

1.6 The process of respiration in green plants occurs:

a) mainly during the day.
b) during day and night.
c) mainly during the night.
d) only during high humidity

1.7 Which of the following is responsible for an increase in the concentration of carbon dioxide in human blood?

a) cellular respiration
b) low blood pressure.
c) Hydrolysis
d) decrease in concentration of atmoshperic carbon dioxide.

1.8 The sequence of breathing involves:

a) Ventilation→external respiration→internal respiration.
b) internal respiration→external respiration.
c) Ventilation→internal respiration→external respiration.
d) external respiration→internal respiration.

1.9 Air passages include the following:

a) pharynx, trachea, bronchus and bronchioles.
b) trachea, bronchus and bronchioles.
c) pharynx, trachea and bronchioles.
d) pharynx, trachea, and bronchus.

1.10 Large communities of organisms that form ecosystems with similar features are referred to as:

a) biospheres.
b) biomes.
c) ecosystems.
d) geographic regions.

1.11 The following are found in an ecosystem:

(i) animal population
(ii) plant population
(iii) community
(iv) abiotic environment
(v) soil

Which of the following pairs make up an ecosystem?

a) (i) and (ii)
b) (iii) and (iv)
c) (ii) and (iii)
d) (iv) and (v)

1.12 Primary and secondary consumers are usually known as:

a) carnivores and omnivores.
b) omnivores and herbivores.
c) herbivores and carnivores.
d) omnivores and decomposers.

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

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

1.14 Aristotle was a Greek philosopher who formulated the:

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

1.15 Robert Whittaker:

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

1.16 The fossilized remains of extinct organisms:

a) provide critical evidence that life has evolved overt time.
b) demonstrate that nature never “takes leaps” in evolution.
c) provide a complete record of evolutionary history
d) occur as frequent, common events.

1.17 Geological time scale is divided into different scales namely:

a) Eon
b) Epochs
c) Era
d) All of the above

1.18 What caused the change in the different era's, and periods on the geological timescale?

a) Climate change.
b) Increased levels of carbon dioxide.
c) Geological time.
d) All of the above

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 name given to the solid food ball which passes down the oesophagus.

2.2 The breakdown of excess amino acids in the liver.

2.3 The ring of muscle which control the opening between the oesophagus and stomach.

2.4 The synthesis of ATP from ADP and 'n phosphate during the hydrogen transfer system in the final stages of cellular respiration.

2.5 The phase of cellular respiration whereby each glucose molecule is turned into two (2) pyruvate molecules.

2.6 A molecule that is broken down during cellular respiration to provide energy in a living cell.

2.7 The type of epithelium on the inside of the trachea.

2.8 The center in the brain responsible for controlling normal breathing.

2.9 The nerve carrying the impulse to the intercostal muscles to contract/relax.

2.10 Zone of air, land and water at the surface of the Earth in which living organisms are found.

2.11 Animals that maintain a constant body temperature and aren't influenced by the fluctuations of the environmental temperature. But some of these animals hibernate during the cold winter months because food is scares.

2.12 The process during which some flowers open in high light intensity and some close in high light intensity.

2.13 The highest taxonomic rank of organisms and which is placed above a kingdom.

2.14 Organisms in which the cells do have a true nucleus.

2.15 Organisms in which the cells do not have a true nucleus, for example bacteria.

2.16 The study of fossil records to discover the history of life, ancient climates and environments.

2.17 Origins of the earliest forms of life in southern Africa.

2.18 Provides a system of chronologic measurement relating to time that is used by earth scientists e.g geologists to describe the timing and relationships between events that have occurred during the history of the earth.

QUESTION 3 **[12]**

Provide a short definition for each of the following:

3.1 Ileo-caecal valve

3.2 Epiglottis

3.3 Fermentation

3.4 ATP

3.5 Phrenic nerve

3.6 Spyrometer

3.7 Biotic organisms

3.8 Ecosystem

3.9 Biodiversity

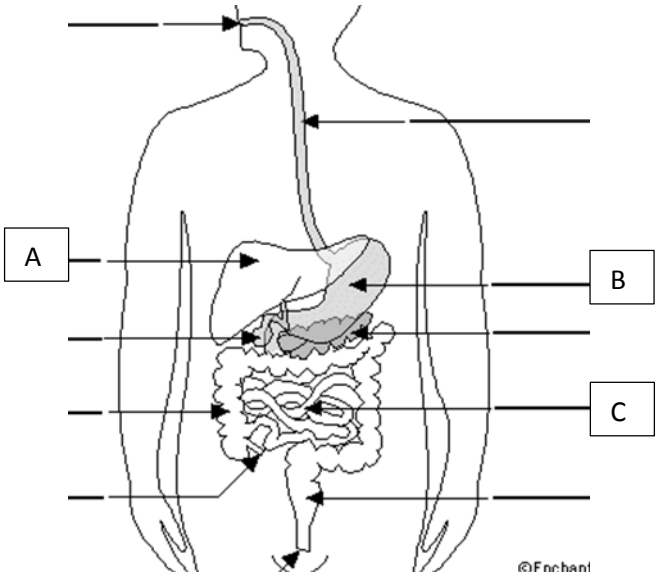
3.10 Biodegradable

3.11 Carl Woese.

3.12 The law of superposition.

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 thee (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)

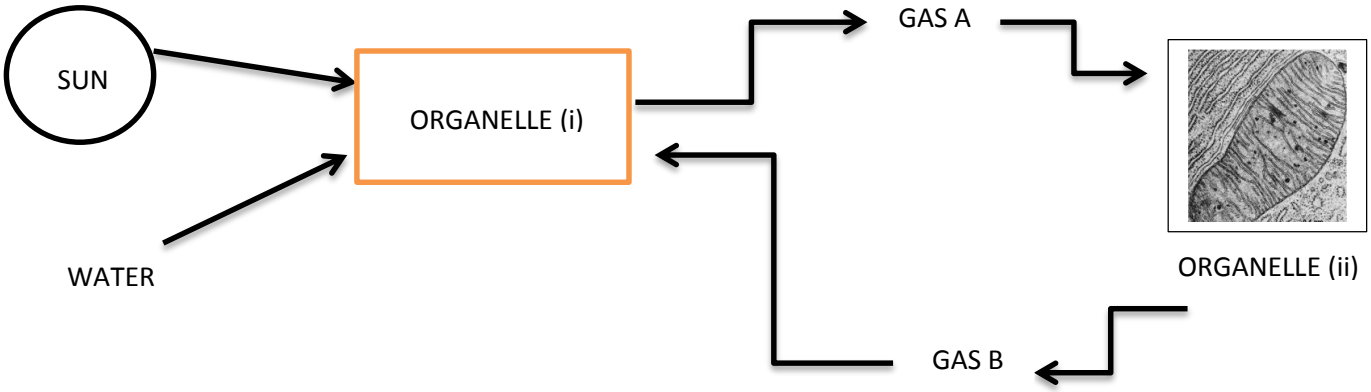
4.1.5 List the two (2) molecules into which broken down amino acids can be converted to. (2)

QUESTION 5 **[17]**

5.1 Provide the diagrammatic representation of the second phase of cellular respiration. (15 x ½ = 7.5)

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)

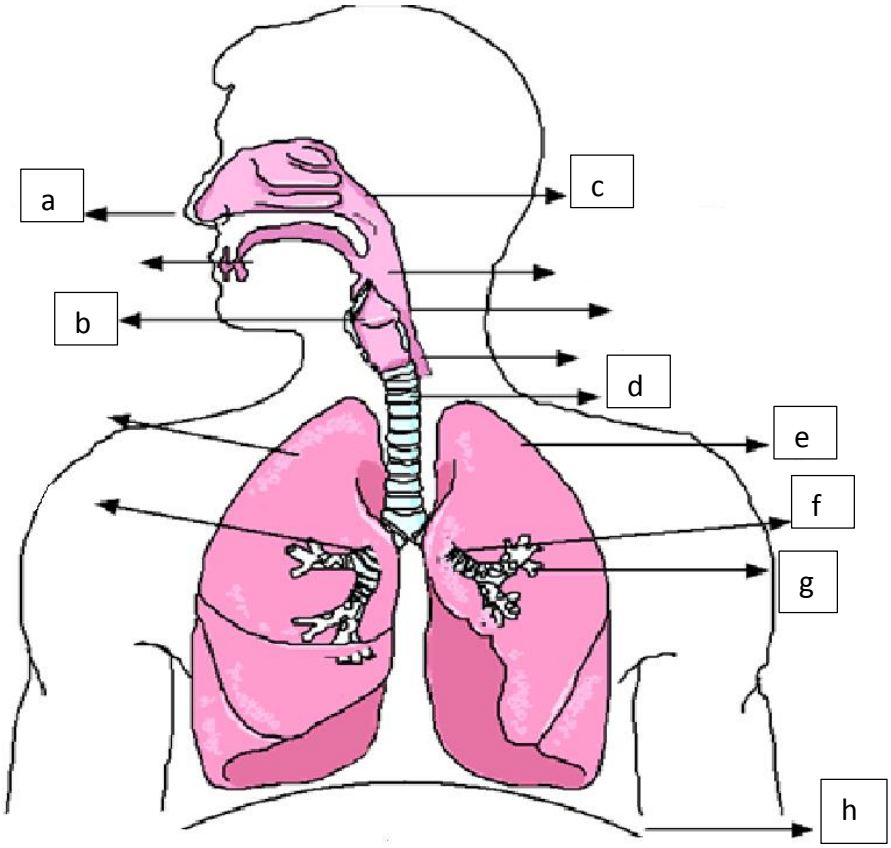
5.3.5 What type of liquid is formed during the last phase of the process taking place in organelle (ii)? (½)

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)

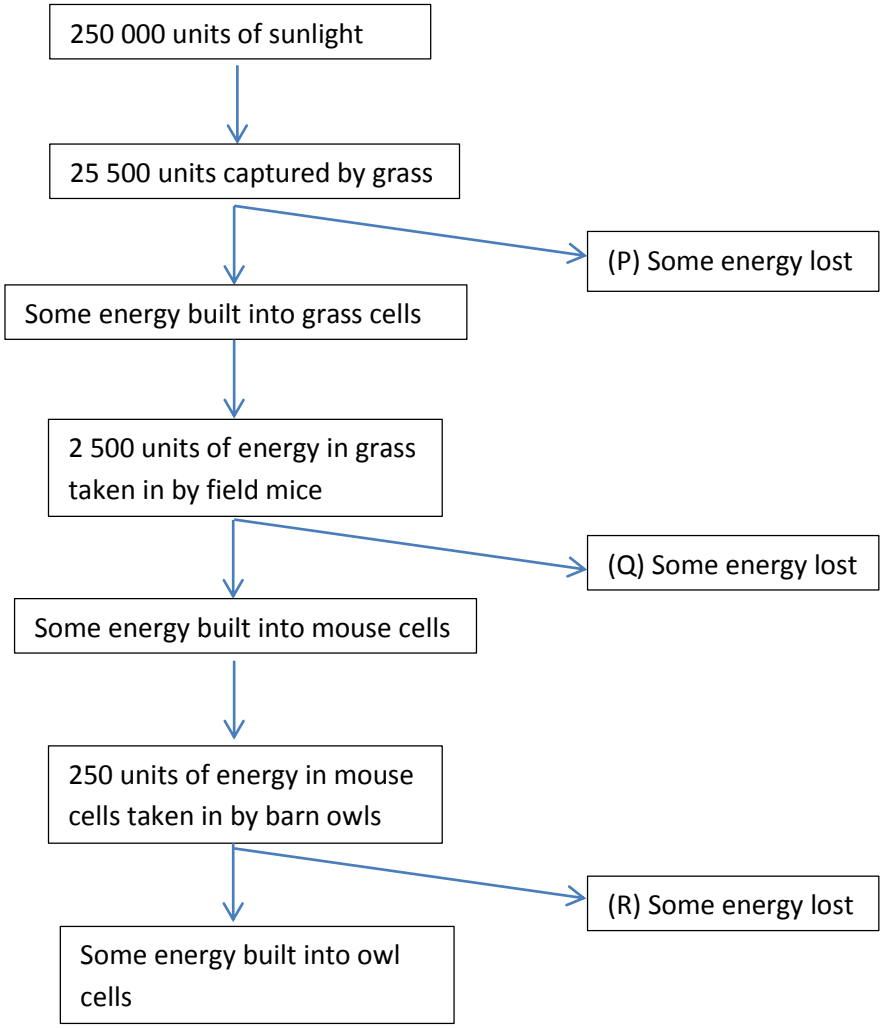


6.3 Explain how the respiratory center in the brain controls normal breathing. (8 x ½ = 4)

6.4 List the names and molecular formula for the two (2) molecules that forms 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 you have studied. (3)

QUESTION 8 **[16]**

8.1 The following names of some southern African organism 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)
