



**FACULTY OF SCIENCE**

**DEPARTMENT OF BOTANY AND BIOTECHNOLOGY**

**LS2BFET**

**LIFE SCIENCE 2B FOR FET TEACHERS**

**APK CAMPUS**

**SUPPLEMENTARY EXAM**

**3 DECEMBER 2014**

<b>SESSION:</b>	<b>08H00 – 11H00</b>
<b>ASSESSOR:</b>	<b>Ms E PRETORIUS</b>
<b>INTERNAL MODERATOR</b>	<b>DR A NEL</b>
<b>DURATION:</b>	<b>3 HOURS</b>
<b>TOTAL MARKS:</b>	<b>150</b>

**NUMBER OF PAGES: 9 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 Which of the following arteries carries the most blood?

- a. Aorta
- b. Right pulmonary artery
- c. Renal artery
- d. Coronary artery

1.2 In which of the following circuits is blood circulated through liver tissue?

- a. Systemic circuit
- b. Hepatic portal circuit
- c. Pulmonary circuit
- d. Coronary circuit

1.3 A boy is bitten by a venomous snake on his left leg. Poison gets to his heart through the \_\_\_\_.

- a. pulmonary vein
- b. left artery
- c. inferior vena cava
- d. hepatic portal vein

1.4 Which of the following is part of the renal circulatory system?

- a. Bowman's capsule.
- b. Glomerulus.
- c. Loop of Henle.
- d. Convoluted tubules.

1.5 An increased antidiuretic hormone level:

- a. promotes water excretion.
- b. increase urea secretion.
- c. promotes water retention.
- d. increases urine production.

1.6 The fluid that collects in the cavity of Bowman's capsule is:

- a. concentrated urine.
- b. blood plasma minus blood proteins.
- c. glycogen and water.
- d. sulphates and water.

1.7 To measure the population density of Koi fishes in a pond in a particular park in Johannesburg, 10 Koi fishes are captured, marked with a small dot on their body, and then released. The next day, another 10 Koi fishes are captured, including the recapture of 2 marked Koi fishes. One would estimate that the population size is \_\_\_\_.

- a. 200
- b. 50
- c. 100
- d. 1000

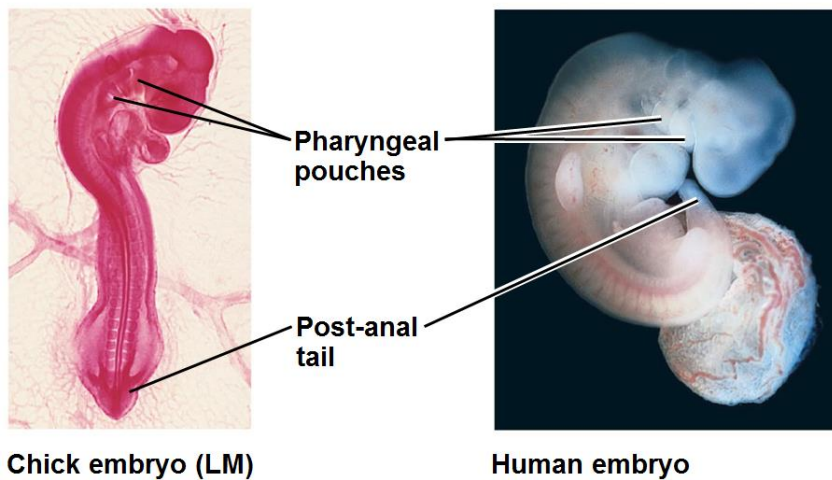
1.8 The most common kind of dispersion in nature is \_\_\_\_.

- a. clump dispersion
- b. random dispersion
- c. uniform dispersion
- d. Indeterminate

1.9 Carrying capacity is \_\_\_\_.

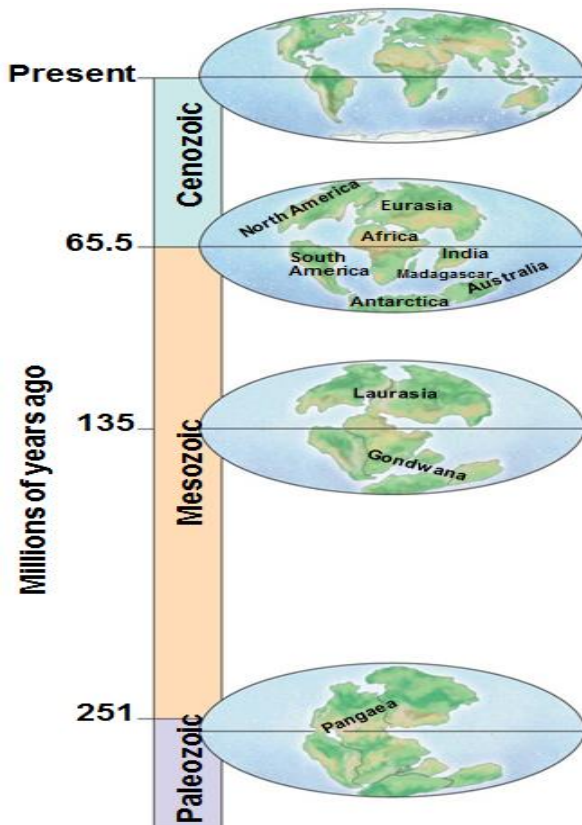
- a. seldom reached by marine producers and consumers because of the vast resources of the ocean
- b. the maximum population size that a particular environment can support
- c. fixed for most species over most of their range most of the time
- d. determined by density and dispersion data

1.10 The diagram below of two (2) embryo's is an example of \_\_\_\_\_.



- a. anatomical homologies not visible in adult organisms
- b. homologous structures
- c. identical embryology
- d. comparative homologies

1.11 The understanding of the process in the diagram below, helps us to \_\_\_\_.



- a. predict when and where different groups evolved
- b. Understand how living organisms may be produced from non-living matter
- c. know the origin and development of an individual organism from embryo to adult
- d. understand Lamarck's theory of evolution

1.12 The diagram below shows an example of \_\_\_\_\_.



- a. gradual pattern change
- b. macro-evolution
- c. punctuated equilibrium
- d. Neo-Darwinism

1.13 The main cause of the increase in the amount of CO<sub>2</sub> in the Earth's atmosphere over the past 150 years \_\_\_\_\_.

- a. has increased worldwide primary production
- b. has increased worldwide standing crops
- c. has caused an increase in the amount of infrared radiation absorbed by the atmosphere
- d. is the burning of larger amounts of wood and fossil fuels

1.14 Which of the following causes excessively high levels of toxic chemicals in fish-eating birds?

- a. Depletion of atmospheric ozone.
- b. Turnover
- c. Biological magnification.
- d. Greenhouse effect.

1.15 The plants in the diagram below are used as important medicinal components in many remedies, what are these plants called?



- a. Pepperbark plants.
- b. Fynbos.
- c. Hoodia.
- d. Rooibos.

1.16 Which of these Hominin traits seems to have occurred before others?

- a. Tool use.
- b. Increased brain size.
- c. Symbiotic thought.
- d. Bipedalism.

- 1.17 The most primitive hominin discovered to date \_\_\_\_\_.  
a. may have hunted dinosaurs  
b. lived 1.2 million years ago  
c. closely resemble a chimpanzee  
d. walked on two legs
- 1.18 Which of these species demonstrates symbolic thought, art, and full blown language?  
a. *H. heidelbergensis*.  
b. *H. erectus*.  
c. *H. ergaster*.  
d. *H. sapiens*.
- 

**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 Blood vessels that carry blood to the heart.
- 2.2 The circulatory system that carries blood from the left ventricle around the body and back to the right atrium of the heart.
- 2.3 The period of the cardiac cycle when the atria and ventricles are contracting.
- 2.4 The tube along which urine is transported from the kidney to the urinary bladder.
- 2.5 The region of the kidney where renal pyramids are found.
- 2.6 The segment of the loop of Henle that is almost impermeable to water.
- 2.7 Differentiation of role's in communities, enabling similar species to coexist in a community.
- 2.8 When different species compete for a resource in short supply.
- 2.9 The sequences of community and ecosystem changes after a disturbance.
- 2.10 Anatomical resemblances that represent variations on a structural theme present in a common ancestor.
- 2.11 The remains and traces of organism from the past, usually found in sedimentary rock.
- 2.12. A tentative answer to a well-framed question, subject to testing.
- 2.13 The contamination of water that does not originate from a single discrete source.
- 2.14 Human harvesting of wild plants or animals at rates exceeding the ability of populations of those species to rebound.
- 2.15 The type of pollution associated pesticides and fertilizers that enter the water system.
- 2.16 The study of human origins.
- 2.17 Australopiths which were more slender and had lighter jaws.

- 2.18 The species that walked fully upright (bipedal), had humanlike hands and teeth and a brain 1/3 of present humans.
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**QUESTION 3****[12]**

Provide a short definition for each of the following:

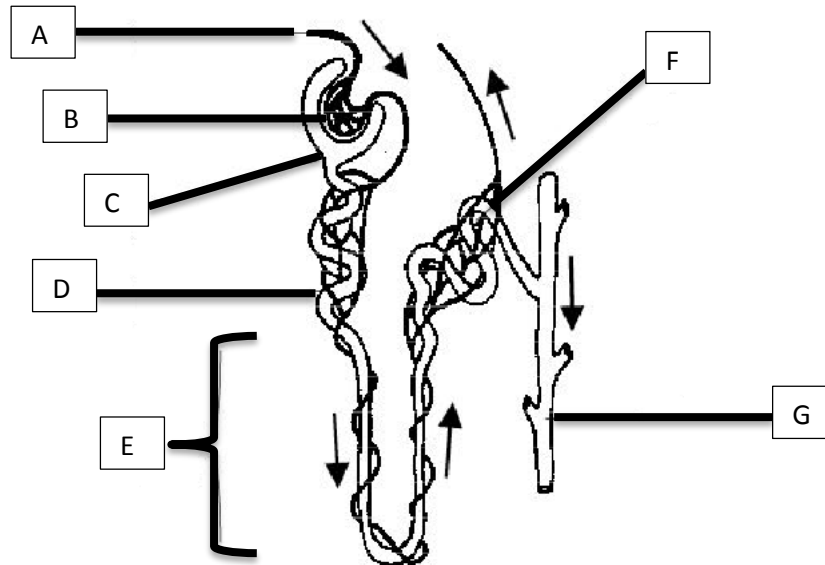
- 3.1 Diastole
  - 3.2 Capillaries
  - 3.3 Aorta
  - 3.4 Loop of Henle
  - 3.5 Cortex
  - 3.6 Eusociality
  - 3.7 Community
  - 3.8 Air pollution
  - 3.9 Anthropogenic impact
  - 3.10 Homology
  - 3.11 *Australopithicus afrensis*
  - 3.12 Greenhouse effect
- 

**QUESTION 4****[16]**

- 4.1 Discuss the flow of blood through the human heart. (20 X ½ = 10)
  - 4.2 What is meant by the term “cardiac cycle?” (2)
  - 3.2 Explain the terms which are used to describe the cardiac cycle. (4)
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**QUESTION 5****[18]**

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



- 5.1.1 Identify the structure above and identify the parts labelled a – g. (8)
- 5.1.2 What happens during tubular secretion and lists six (6) substances that will form part of the tubular fluid. (4)
- 5.1.3 Name and briefly discuss the process taking place between parts labelled B and C. (6)

**QUESTION 6****[17]**

- 6.1 The population growth in density-dependent populations is affected by many factors. Name five (5) and briefly explain these factors. (10)
- 6.2 Density of a population is influenced by 4 (four) factors. Name these factors and briefly discuss each of them. (4)
- 6.3 Survivorship curves can be classified into three general types. Briefly explain the three (3) types of survivorship curves. (6 x ½ = 3)

**QUESTION 7****[17]**

- 7.1 Name five (5) consequences of deforestation. (5)
- 7.2 Name five (5) contributors to land pollution. (5)

- 7.3 Fill in the missing words to formulate an accurate scientific statement. (5)
- Life on Earth is protected from damaging effects of **7.3.1** by a protective layer of molecules in the atmosphere.
  - Satellite studies suggest that the protective layer of molecules has been gradually **7.3.2 thinning / thickening (choose the correct word)**.
  - Destruction of atmospheric protective gasses probably results from **7.3.3** produced by human activity.
  - Due to the burning of fossil fuels and other human activities, the concentration of atmospheric **7.3.4** has been steadily increasing.
  - **7.3.5** species are typically introduced to a new environment by humans.
- 7.4 Explain what is meant with “overgrazing” that form part of the national environmental issues. (2)
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**QUESTION 8****[16]**

- 8.1 Name the four (4) kinds of evidence that exist about the origin of ideas about the origin of life (evolution). (4)
- 8.2 What are the main observations that Darwin made on his journey around the world? (4)
- 8.3 Speciation is the origin of new species.  
Name and discuss the speciation where the populations are isolated. (4)
- 8.4 The following questions is based on the background information on Darwin.
- 8.4.1 What is Darwin’s first name? (1)
- 8.4.2 His interest in the geographic distribution of species was triggered by a stop at a specific place, namely? (1)
- 8.4.3 What was the name of the ship that Darwin travelled around the world? (1)
- 8.4.4 How long was the voyage on the ship, during which he conducted his research? (1)
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**QUESTION 9****[18]**

9.1 Fit column B with column A.

(7)

<b>COLUMN A</b>	<b>COLUMN B</b>
9.1.1 <i>Homo neanderthalensis</i>	A. Lived: 1.8 million years to 100 000 years ago.
9.1.2 <i>Paranthropus boisei</i>	B. Nickname: Goliath.
9.1.3 <i>Homo sapien</i>	C. Nickname: Hobbit.
9.1.4 <i>Homo heidelbergensis</i>	D. Nickname: Handyman.
9.1.5 <i>Homo habilis</i>	E. Lived: 200 000 years ago to present.
9.1.6 <i>Homo floresiensis</i>	F. Relied heavily on meat, such as bison, deer and musk ox.
9.1.7 <i>Homo erectus</i>	G. Nickname: Nutcracker man.

9.2 Briefly discuss each of the following to ensure that the reader knows the meaning of the term.

9.2.1 Hominins (2)

9.2.2 Australopiths (2)

9.3 Complete the following table to accurately compare two (2) Hominins. (4)

<b>CHARACTERISTIC</b>	<b><i>Homo erectus</i></b>	<b><i>Homo sapiens</i></b>
Brain	900cc – 1100cc	9.3.1
Skull	9.3.2	9.3.3
Skeleton	9.3.4	More slender slighter build

9.4 Briefly indicate where *Paranthropus boisei* lived and was his diet consisted of. (3)**TOTAL 150**