SUPPLEMENTARY EXAMINATION (UNIT1-6)
January 2020
Lecturer: Ms E Pretorius
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 letter next to the appropriate question number in your answer book.*

1.1 The veins in the pulmonary circuit transport _____.

a. nutrients
b. carbon dioxide
c. lymph
d. oxygen

1.2 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

1.3 In the human heart ___.

a. the main pumping action is by the atria
b. oxygenated blood enters the right ventricle
c. blood from the right ventricle flows to the lungs
d. blood from the systemic circuit enters the left atrium

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

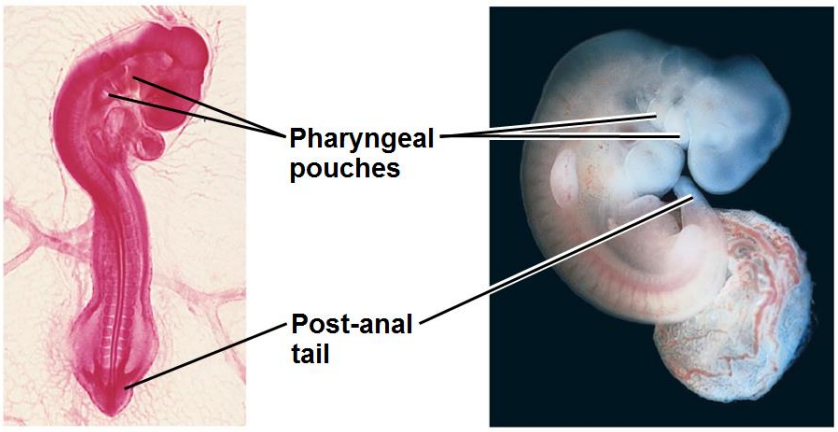
1.8 The most common kind of dispersion in nature is ____.

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

1.9 Carrying capacity is ___.

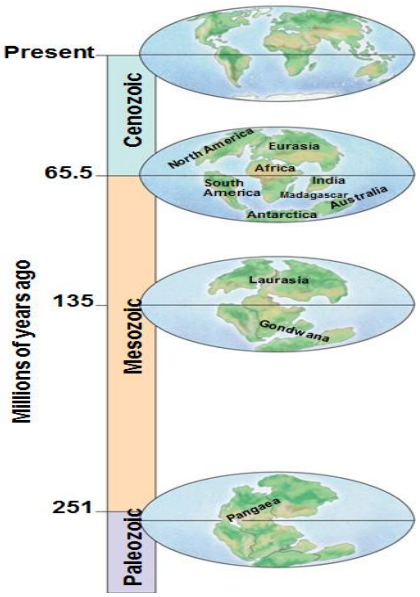
a. seldom reached by marine producers and consumers because of the vast resources of the ocean
b. the maximum population size that a particular environment can support
c. fixed for most species over most of their range most of the time
d. determined by density and dispersion data

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



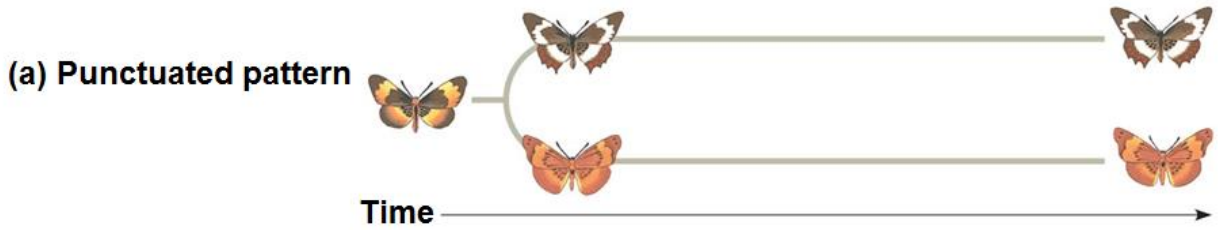
a. anatomical homologies not visible in adult organisms
b. homologous structures
c. identical embryology
d. comparative homologies

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 orgin and development of an individual organism from embryo to adult
d. understand Lamarck's theory of evolution

1.12 The diagram below shows and example of _____.



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

1.13 The increase in the amount of CO_2 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 caused by 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 The circulation system where the heart pumps deoxygenated blood to the lungs and oxygenated blood back to the heart.

2.2 The atrioventricular valve found on the right side of the heart.

2.3 Fibres found in the human heart that receive impulses from the AV nodes after a short period of delay.

2.4 Synonym for high blood pressure.

2.5 The collective name for the glomerulus and capsule of Bowman.

2.6 The region of the kidney that contains the glomerulus.

2.7 The area in the kidneys between the pyramids.

2.8 Excretion organ of an earthworm.

2.9 The study of the vital statistics of a population and how they change over time.

2.10 The birth rate minus the death rate with no environmental restrictions.

2.11 A type of growth pattern where members experience many reproductive events throughout their lifetime.

2.12 The type of survival curve where the death rate is constant over the organism's life span.

2.13 Anatomical resemblances that represent variations on a structural theme present in a common ancestor.

2.14 If an environment changes over time, this process, may result in adaptation.

2.15 Speciation that takes place in geographically overlapping populations.

2.16 Offspring of crosses between different species.

2.17 A term that designates an effect or object resulting from human activity.

2.18 The leaching out of nitrogen compounds from fertilized agricultural lands is an example of this specific type of pollution.

QUESTION 3 **[12]**

Provide a short definition for each of the following:

3.1 Veins

3.2 Systemic circuit

3.3 Systole

3.4 Medulla

3.5 Osmoregulation

3.6 Filtration

3.7 Interspecific competition

3.8 Ecological succession

3.9 Ozone

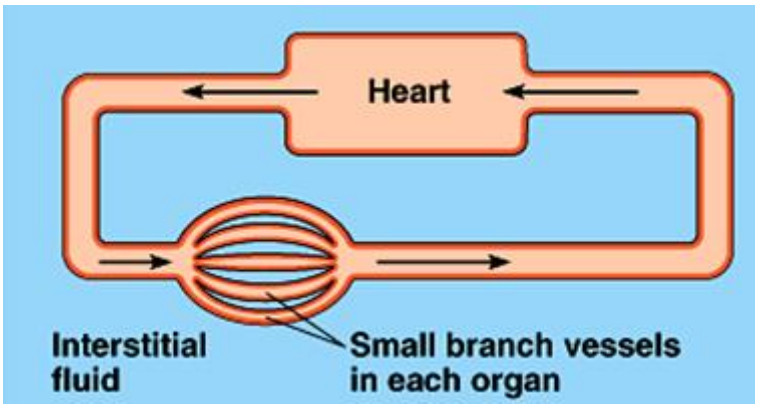
3.10 Greenhouse effect

3.11 "Gracile"

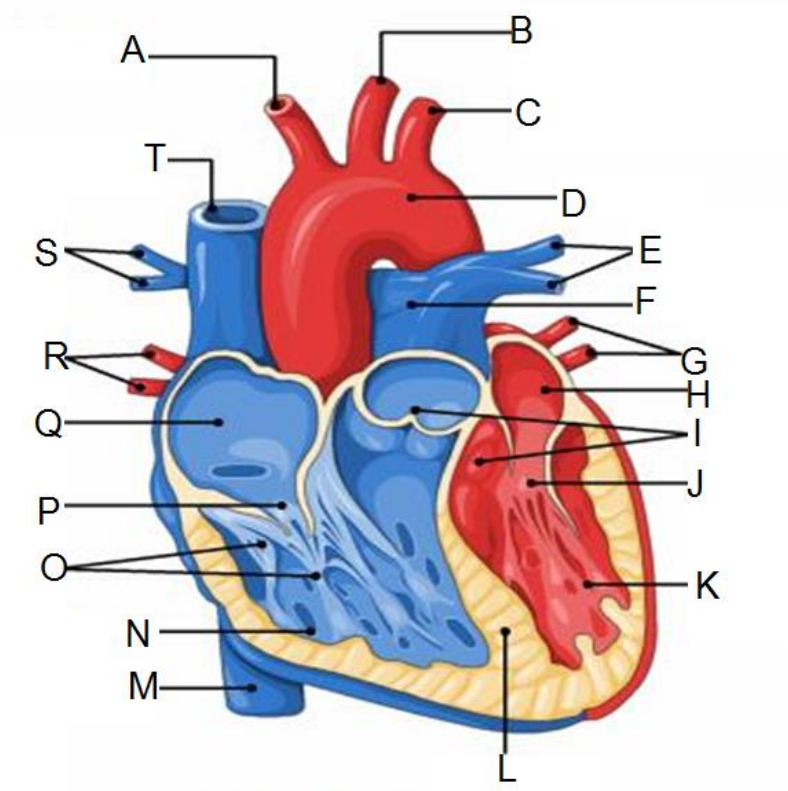
3.12 Microevolution

QUESTION 4 **[18]**

4.1 Identify the type of circulatory system represented by the diagram below and briefly discuss this type of circulatory system. (4)



4.2 Study the diagram of the human heart below and answer the questions that follow.



4.2.1 Give the numbers and names of the blood vessels that pump deoxygenated blood in the heart. Also state from where to where do each blood vessel pump the blood. (6)

4.2.2 Give the numbers and names of the blood vessels that pump oxygenated blood in the heart. Also state from where to where do each blood vessel pump the blood. (4)

4.2.3 Label bloodvessels A, B and C. (3)

4.3 What is the function of a capillary tube? (1)

QUESTION 5 **[18]**

5.1 How do the kidneys aid in maintaining the acid-base balance in the body? (5)

5.2 How do the kidneys help to maintain homeostasis in the human body? (4)

5.3 Name five (5) excretory organs and the substances they excrete from the human body. (10 x ½ = 5)

5.4 Draw and label a longitudinal section through a sheep kidney. (8 x ½ = 4)

QUESTION 6 **[18]**

6.1 To measure the population of lake trout in a 250 hectare lake, 200 individuals were netted and marked with a fin clip, and then returned to the lake. The next week, the lake is netted again, and out of the 200 lake trout that are caught, 50 have fin clips. Use the capture-recapture method to estimate the population size of the lake trout. Show all your calculations. (4)

6.2 Environmental and social factors influence spacing of individuals in a population. Name three (3) types of spacing patterns found in nature and briefly explain each one. (6)

6.3 Explain what is meant by the following, by supplying a good definition of each term or phrase. Examples can be given to broaden the explanation.

6.3.1 Herbivory (2)

6.3.2 Endoparasites (3)

6.3.3 Ecological succession (3)

QUESTION 7 **[16]**

7.1 What do fossil records supply us with to understand the origin of life on earth? (3)

7.2 Convergent evolution is the evolution of similar, or analogous, features in distantly related groups. How do analogous traits arise in nature? (2)

7.3 What does the phrase "descent with modification", as used by Darwin, refer to? (2)

7.4 Distinguish between artificial selection and natural selection. (3)

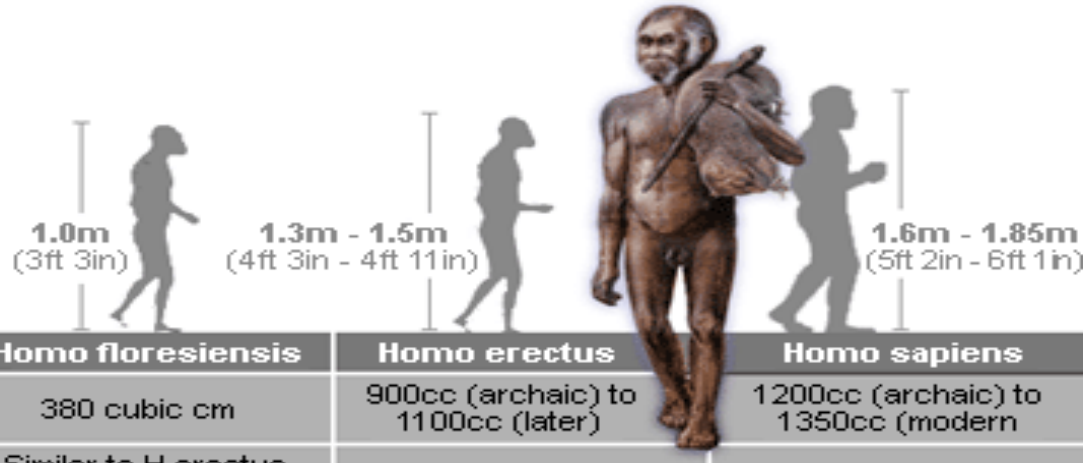
7.5 Use an appropriate example to explain evolution and natural selection in modern times. (6)

QUESTION 8 **[16]**

8.1 Name four (4) national environmental issues you have studied except deforestation. Discuss deforestation as a worrying national environmental issue. (16)

QUESTION 9 **[16]**

9.1 Compare *Homo floresiensis*, *Homo erectus* and *Homo sapiens* with regard to their brain size, skull (brow ridge), skeleton and when they lived. (12)



	Homo floresiensis	Homo erectus	Homo sapiens
Brain	380 cubic cm	900cc (archaic) to 1100cc (later)	1200cc (archaic) to 1350cc (modern
Skull	Similar to H erectus, though with slightly brow ridge	Flat, thick, large brow ridges	Short, high, small no brow ridges
Skeleton	Similar to H erectus, but smaller, very well pelvis, bipedal stance	Robust, suggesting heavy musculature	More slender slighter build
Lived	Remains date 18,000 years ago, possibly existed 800,000 yrs old	c 1.9m years ago to c 25,000 years ago	c 150,000 years ago to present

9.2 What ancestral *Homo* species used hunting tools? (1)

9.3 What 18,000 year old fossil were found in Indonesia in 2004? (1)

9.4 Name two (2) common misconceptions about early Hominins. (2)