NOVEMBER EXAMINATION (UNIT1-6)
November 2019
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 The reabsorption of water in the kidneys is controlled by the hormone ADH. A high concentration of ADH will cause the permeability of the:

a. wall of the collecting duct to increase.
b. inner wall of the glomerulus to decrease.
c. wall of the proximal convoluted tubule to decrease.
d. wall of the loop of Henle to increase.

1.5 Which of the following characteristics is caused by a lack of ADH?

a. The urine contains too much Na+.
b. The urine contains glucose.
c. The person does not have any need for water.
d. The person excretes large quantities of urine.

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 monarch butterflies occupying a particular park in Johannesburg, 100 butterflies are captured, marked with a small dot on a wing, and then released. The next day, another 100 butterflies are captured, including the recapture of 10 marked butterflies. One would estimate that the population size is ____.

a. 200
b. 1000
c. 500
d. 10000

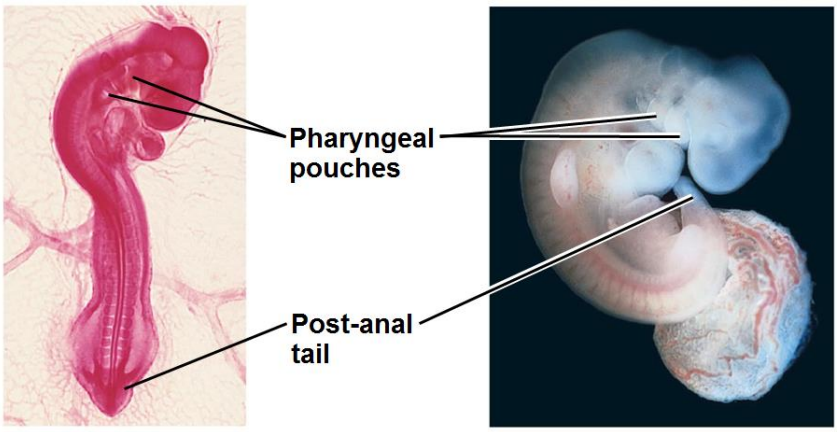
1.8 The most common kind of dispersion in nature is ____.

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

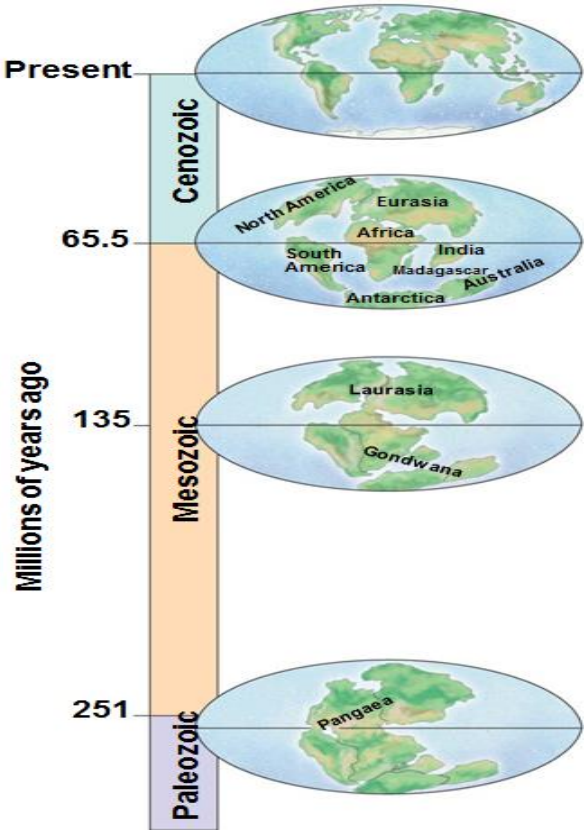
1.10 The diagram below of two (2) embryo's is an example of _____.



Chick embryo (LM) **Human embryo**

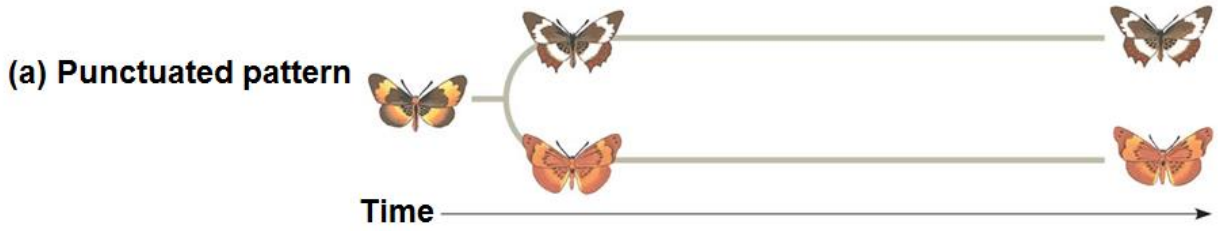
a. anatomical homologies not visible in adult organisms
b. homologous structures
c. identical embryology
d. comparative homologies

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 main cause of 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 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 was the first to craft stone tools?

a. *H. heidelbergensis*.
b. *H. erectus*.
c. *H. ergaster*.
d. *H. habilis*.

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 stage of relaxation of atria/ventricles during which they are filled with blood.

2.2 The smallest blood vessels in the body.

2.3 The largest artery in the body, which leaves the left ventricle.

2.4 The hormone that increases the permeability of the collecting ducts of the kidney to water.

2.5 The hairpin-like structure segment of the tubular component of a kidney nephron that is situated between the proximal and distal convoluted tubules.

2.6 The region of the kidney in which Malpighian bodies are located.

2.7 The type of social behaviour found in insects such as bees and wasps.

2.8 An assemblage of populations of various species living close enough for potential interaction, in a specific area at a specific time.

2.9 A species' use of biotic and abiotic resources or the organism's ecological role.

2.10 The evolution of similar or analogous features in distantly related groups.

2.11 The process whereby humans select and breed individuals with desired traits.

2.12 A process that refers to evolutionary change above the species level.

2.13 The study of similarity resulting from common ancestry.

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 with aerosol spray cans.

2.16 The study of human origins.

2.17 Australopiths which had sturdy skulls and powerful jaws.

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

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

3.7 Interspecific competition

3.8 Ecological succession

3.9 Ozone

3.10 Greenhouse effect

3.11 "Gracile"

3.12 Microevolution

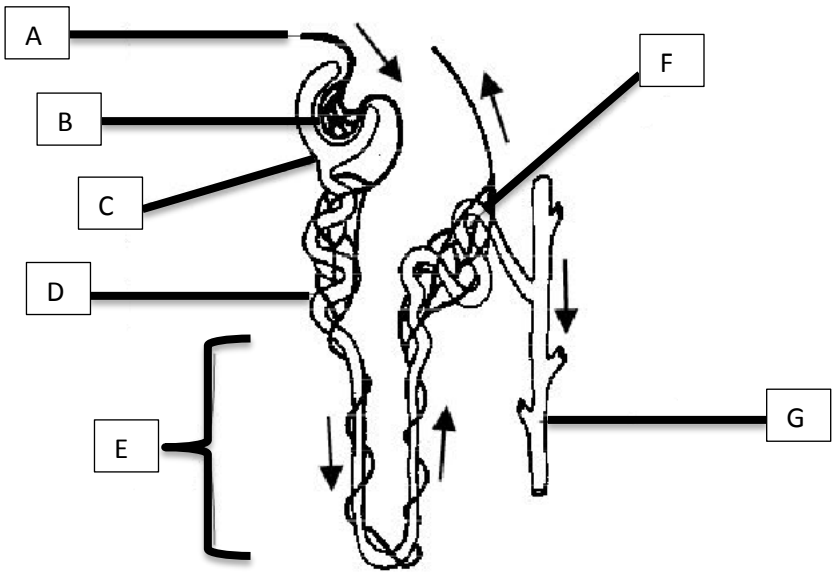
QUESTION 4 **[18]**

4.1 Discuss the flow of blood through the human heart. (20 X ½ = 10)

4.2 Discuss the cardiac cycle of the human heart. (8)

QUESTION 5 **[16]**

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



5.1.1 Discuss the process of secretion that will take place in the part labelled F. (10 x ½ = 5)

5.2 Study the diagram in 5.1 and provide the name of the section for each of the letters below **and** the process that will take place in each of those sections. (10)

5.2.1 C
5.2.2 D
5.2.3 E
5.2.4 F
5.2.5 G

5.3 What is the name of the hormone responsible for salt regulation in the blood? (1)

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 What is population ecology? (6 x ½ =3)

6.3 What is the use of age structure diagrams to a country? (2)

6.4 What do you understand under demographic transition? (4 x ½ = 2)

QUESTION 7 **[16]**

7.1 Discuss air pollution by answering the following questions:

a) Explain the concept of air pollution. (2)
b) Identify three (3) sources of air pollution. (3)
c) Provide two (2) examples of how air pollution impacts on human health. (2)
d) Provide three (3) examples of how air pollution can be prevented? (3)

7.2 Distinguish between point source water pollution and non-point source water pollution? (6)

QUESTION 8 **[17]**

8.1 Darwin spend some time on the Galapagos Islands where he made some observations. Explain what he observed regarding the finches. (7)

8.2 Explain what artificial selection is and use an example to support your answer (4)

8.3 Explain the following types of developmental theories. (6)
8.3.1 Spontaneous creation.
8.3.2 Lamarckism.

QUESTION 9 **[18]**

9.1 Fit column B with column A. (7)

COLUMN A	COLUMN B
9.1.1 *Homo neanderthalensis*	A. Lived: 1.8 million years to 100 000 years ago.
9.1.2 *Paranthropus boisei*	B. Nickname: Goliath.
9.1.3 *Homo sapien*	C. Nickname: Hobbit.
9.1.4 *Homo heidelbergensis*	D. Nickname: Handyman.
9.1.5 *Homo habilis*	E. Lived: 200 000 years ago to present.
9.1.6 *Homo floresiensis*	F. Relied heavily on meat, such as bison, deer and musk ox.
9.1.7 *Homo erectus*	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 Autralopiths (2)

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

CHARACTERISTIC	***Homo erectus***	***Homo sapiens***
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 what his diet consisted of. (3)

TOTAL 150