UNIVERSITY OF JOHANNESBURG

UNIT 1-6: NOVEMBER EXAM 1
NOVEMBER 2021
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TOTAL 150
THIS PAPER CONSIST OF 9 QUESTIONS AND 11 PAGES

INITIALS & SURNAME:
STUDENT NR:

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 Deoxygenated blood is pumped to _____.

A. lungs from heart
B. heart from lungs
C. the arteries
D. the veins

1.2 Walls of the left ventricle are thicker than walls of the right ventricle because _____.

A. has to pump the blood to lungs
B. it has to pump blood to the whole body
C. blood reaches this ventricle with extra pressure
D. blood reaches this ventricle in huge amount

1.3 The heart valves do all of the following, EXCEPT: _____.

A. separate the atria and the ventricles
B. keep the blood flowing forward
C. regulate the heart's contractions
D. include the mitral valve and bicuspid valve

1.4 Internally, both kidneys have three (3) distinct regions _____.

A. The cortex, mediastinum, and pelvis
B. The cortex, medulla, and peritoneum
C. The carina, medulla, and pelvis
D. The cortex, medulla, and pelvis

1.5 In human kidneys, the renal pelvis is also called _____.

A. base of ureter
B. base of urinary tract
C. base of urinary bladder
D. base of urethra

1.6 An increase in the permeability of the cells of the collecting tubule to water, is due to

A. a decrease in the production of ADH
B. an increase in the production of ADH
C. an increase in the production of aldosterone
D. an decrease in the concentration of the blood plasma

1.7 Which distribution pattern does territoriality produce?

A. Clumped
B. Random
C. Uniform
D. None of the above.

1.8 The mortality rate of organisms following a type III survivorship curve is _____.

A. fairly constant throughout life
B. higher in post-reproductive years
C. unrelated to age
D. lower after the organisms become established

1.9 Which of the following is not an outcome of high population density?

A. Predators tend to ignore prey that is overabundant.
B. Mortality increase.
C. Toxic waste accumulation.
D. Reproduction reduction.

1.10 Sustainable development will not aim at _____.

A. maximising the present day benefits through increased resource consumption
B. reasonable and equitable distributed level of economic well being that can be perpetuated continually
C. social economic development which optimise the economic and societal benefits available in the present, without spoiling the likely potential for similar benefits in the future
D. development that meets the need of the present without compromising the ability of future generation to meet their own needs

1.11 Electronic waste is the adverse effect of _____.

A. agriculture
B. industry
C. housing
D. mining

1.12 This human activity among the following, causes maximum environmental pollution with regional and global impacts, is _____.

A. urbanization
B. industrialization
C. agriculture
D. mining

1.13 The phenomena where popular belief is that mice occur surprisingly from stored grain, is also referred to as _____.

A. Ontogeny
B. Lamarckism
C. Spontaneous creation
D. Neo Darwinism

1.14 Adaptations that evolve within population confined to one (1) gene pool is known as ____.

A. evolution
B. macro evolution
C. micro evolution
D. speciation

1.15 The fossil record shows evidence of _____.

A. extinction of species
B. changes within groups over time
C. origin of new groups
D. all of the above

1.16 The first use of fire by hominids is associated with _____.

A. *Homo habilis*
B. *Homo*

C. *Australopithecus afarensis*

D. *Homo erectus* / *Homo sapiens*

1.17 The average brain size of a modern human is _____ cubic centimeters.

A. 1200-1350
B. 800-1000
C. 100-200
D. 1600-1800

1.18 Lucy belonged to which one (1) of the following species?

A. *Australopithecus robustus*
B. *Australopithecus afarensis*
C. *Australopithecus boisei*
D. *Australopithecus anamensis*

QUESTION 2: [18]

Provide the correct biological term for the following statements.

2.1 The inferior chambers of the human heart.
2.2 Blood vessels transporting deoxygenated blood away from the heart.
2.3 The circuit transporting blood between the heart cells and alveoli.
2.4 Type of environment outside the body of a freshwater fish.
2.5 Type of excretory system used by the grasshopper.
2.6 The structure within the medulla area in the kidney.
2.7 Influx of new individuals from other areas.
2.8 The study of populations in relation to their environment
2.9 The pattern of spacing among individuals within boundaries op population.
2.10 An overland flow / downslope movement of water (thin, continuous film over relatively smooth soil / rock surfaces).
2.11 A situation when plants are exposed to intensive feeding for extended periods of time, or without sufficient recovery periods.

2.12 The agricultural practice of producing or growing a single crop or plant species over a wide area and for a large number of consecutive years.
2.13 The drug designed to interfere and cause errors in the manufacture of DNA from the virus.
2.14 The type of speciation that takes place in geographically overlapping populations where a reproductive barrier isolates a subset of a population.
2.15 Gene flow interrupted / reduced when population divided into geographically isolated subpopulations.
2.16 The study of human origins.
2.17 Australopiths which had sturdy skulls and powerful jaws were referred to as _____.
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 the correct biological statement for the following terms.

3.1 Gas exchange.
3.2 Left ventricle.
3.3 Renal artery.
3.4 Aldosterone.
3.5 Density.
3.6 Lag phase.
3.7 Point source water pollution.
3.8 Biological magnification.
3.9 Ozone
3.10 Greenhouse effect
3.11 *Australopithicus africanus*
3.12 Bipedal

QUESTION 4: 19]

4.1 The human heart functions with two (2) distinct circuits. Explain in detail the flow of blood in the systemic circuit. (9)

4.2 What are the typical components of a closed circulatory system? (3)

4.3 What is the difference between systole and diastole? (2)

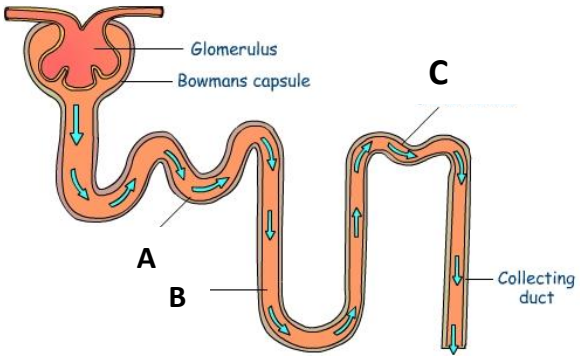
4.4 Answer the questions by only writing the correct answer (a-e) next to the appropriate question number. (5)

COLUMN A	COLUMN B
4.4.1 Venule	a) Smallest of the blood vessels.
4.4.2 Artery	b) Large vessel carrying lymph from lymph nodes to the blood.

4.4.3 Capillary	c) A narrow vessel regulating the flow of blood from an artery into a capillary network.
4.4.4 Vein	d) A wide, thin-walled vessel carrying blood back to the heart.
4.4.5 Arteriole	e) Filled with pericardial fluid.
	f) A small, thin-walled vessel carrying blood from a capillary network to a vein.
	g) A thick-walled, elastic vessel carrying blood away from the heart.

QUESTION 5: [17]

5.1 Study the following diagram and answer the questions that will follow.



5.1.1 Provide the labels for the letters A-C in the diagram in 5.1. (3)

5.1.2 Discuss the process that will take place in the area labelled B and C in the diagram in 5.1. (12 x ½ = 6)

5.2 How will the kidneys be able to reabsorb sodium? (4)

5.3 How will the kidney be able to maintain homeostasis? (4)

QUESTION 6: [16]

6.1 A biologist catches twelve (12) red scorpions from a deserted mine dump in Krugersdorp, paint a non-toxic, white dot on their bodies, and releases them unharmed. A week later, he catches eight (8) red scorpions from the same mine dump, including six (6) with white paint.

6.1.1 Based on the mark-recapture method, estimate the number of red scorpions found in the mine dump area in Krugersdorp.
Show all calculations and equations (5)

6.1.2 Suggest another way of marking the red scorpions. (1)

6.2 Make use of diagrams to discuss the different types of dispersion patterns and how the population in each one of the patterns is influenced. (6)

6.4 The population growth in density-dependent populations are affected by many factors. Discuss the following two (2) factors.
6.4.1 Disease. (2)
6.4.2 Toxic wastes. (2)

QUESTION 7: [17]

7.1 Provide two (2) examples of how the following natural resources can be used for humans:
7.1.1 *Harpagophytum*: (2)

7.1.2 *Hypoxis*: (2)

7.2 Discuss "overgrazing" as a natural environmental issue:
a) Define the concept of overgrazing. (2)
b) Provide two (2) examples of how overgrazing takes place? (2)
c) Provide three (3) examples of the consequences of "overgrazing". (3)

7.3 Discuss the following three (3) national environmental issues. (6)

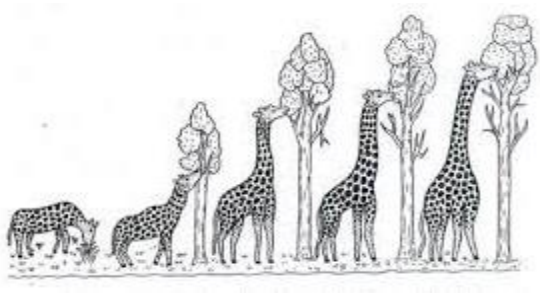
7.3.1 Deposit of toxic substances.
7.3.2 Introduction of invasive species:
7.3.3 Overexploitation of indigenous resources:

QUESTION 8: [17]

8.1 Study the following four (4) diagrams and answer the questions that follows.

a) 

b) 

c) 

d) 

8.1.1 Provide a label for the four (4) diagrams that represent the history of different theories of development. (4)

8.1.2 Indicate how each diagram relates to the four (4) different theories of development. (4)

8.2 Explain how wild mustard can be seen as an example of artificial selection. (4)

8.3 Discuss HIV as a modern example of natural selection and evolution. (5)

QUESTION 9: [16]

9.1 Tabulate the following characteristics to compare *Homo floresiensis*, *Homo erectus* and *Homo sapiens*.

a) Brain size
b) Skull (brow ridge)
c) Skeleton size and build
d) When they lived. (12)

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

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

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

TOTAL 150