education

Department:
Education
PROVINCE OF KWAZULU-NATAL

NATIONAL SENIOR CERTIFICATE

GRADE 11

LIFE SCIENCES

COMMON TEST

SEPTEMBER 2019

MARKS: 60

TIME: 1 hour

This question paper consists of 8 pages.

Copyright reserved

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer ALL the questions.
2. Write ALL the answers in the ANSWER BOOK.
3. Start the answers to each question at the top of a NEW page.
4. Number the answers correctly according to the numbering system used in this question paper.
5. Present your answers according to the instructions of each question.
6. Do ALL drawings in pencil and label them in blue or black ink.
7. Draw diagrams, tables or flow charts only when asked to do so.
8. The diagrams in this question paper are NOT necessarily drawn to scale.
9. Do NOT use graph paper.
10. You may use a non-programmable calculator, protractor and a compass.
11. Write neatly and legibly.

Copyright reserved

SECTION A

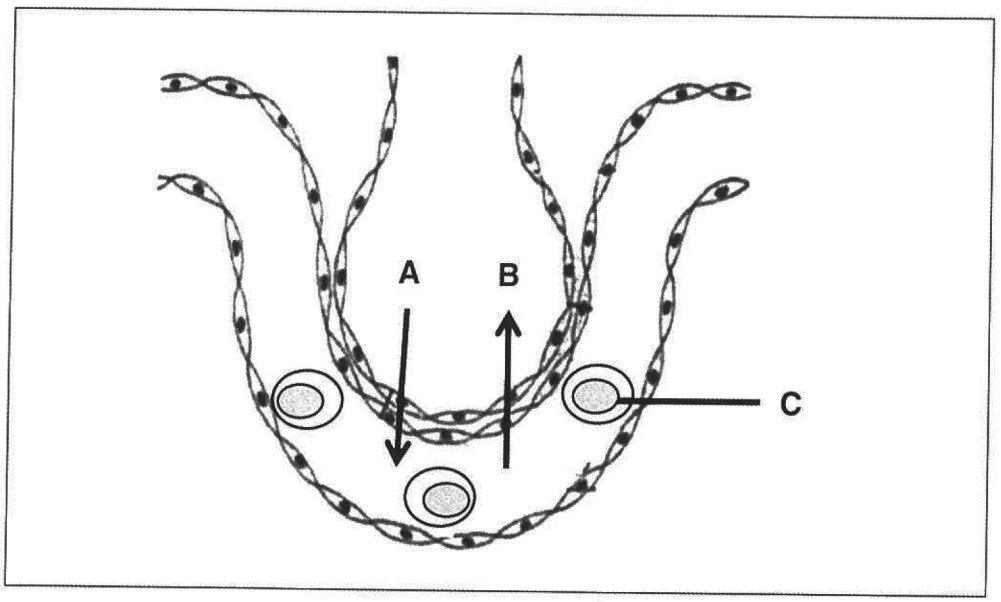
QUESTION 1

1.1 Various options are provided as possible answers to the following questions. Choose the answer and write only the letter (A to D) next to the question number (1.1.1 to 1.1.5) in the ANSWER BOOK, for example 1.1.6 D.

1.1.1 The effect of thermal pollution in aquatic environments is that it . . .

A lowers the amount of oxygen in water
B lowers the amount of carbon dioxide in water
C lowers the amount of oxygen for aquatic plants
D lowers the amount of carbon dioxide for aquatic animals

QUESTION 1.1.2 and **1.1.3** are based on the diagram below



1.1.2 Gas **A** in the blood is mostly transported...

A as bicarbonate ions
B as carbhaemoglobin
C in solution with blood plasma
D as oxyhaemoglobin

1.1.3 Identify **B** and **C**, respectively.

A **B** is carbon dioxide and **C** is blood plasma
B **B** is carbon dioxide and **C** is red blood cells
C **B** is oxygen and **C** is blood plasma
D **B** is oxygen and **C** is red blood cells

Copyright reserved

1.1.4 An effect of deforestation is that it …

A decreases soil erosion
B decreases biodiversity
C decreases climate change
D decreases carbon dioxide

1.1.5 The hormone aldosterone regulates the concentration of …

A waste substances
B glucose
C sodium ions
D carbonate ions

(5 x 2) **(10)**

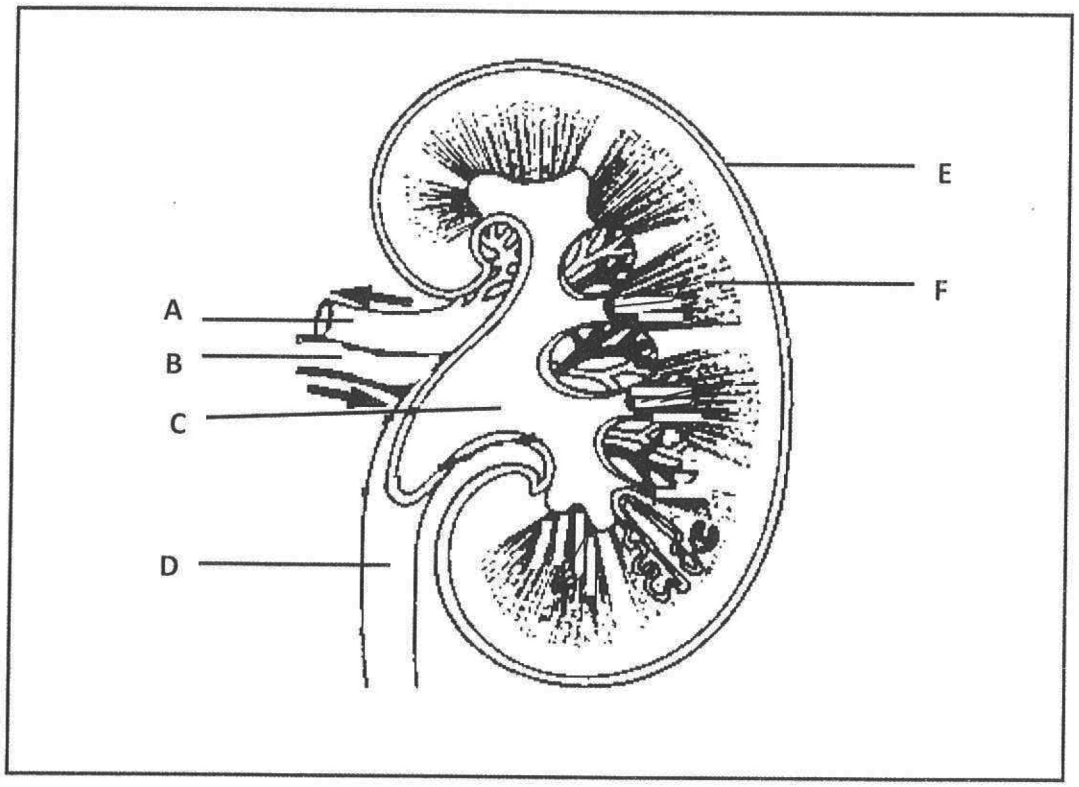
TOTAL SECTION A 10

Copyright reserved

SECTION B

QUESTION 2

2.1 The diagram below shows a section through a kidney and answer questions that follow



2.1.1 Name the functional unit of the kidney. (1)

2.1.2 Give the LETTER and the NAME of the part that:

(a) encloses and protect the kidney (2)

(b) is a large cavity leading to the ureter (2)

(c) is cone shaped and consisting of many ducts collecting urine (2)

2.1.3 Explain the role of ADH in raising the volume of water in the blood. (3)
(10)

Copyright reserved

2.2 Invasive alien plants have become South Africa's worst enemy due to their ability to deplete the country's water and their effect on biodiversity.

2.2.1 What are alien plants? (1)

2.2.2 State the effect of alien plants on water availability. (1)

2.2.3 Explain the effect of removal of alien plants on the country's economy. (3)
(5)

QUESTION 3

South Africa ranked amongst highest in carbon dioxide emission

South Africa is counted amongst the top 20 countries with highest recorded carbon dioxide emission. The province of Mpumalanga was identified as the most carbon emitting province in this country owing to a number of coal-fired power stations and industries found in this area. The government is still working on finding ways to decrease the amount of carbon dioxide emitted by this province.

3.1.1 Name TWO activities mentioned in the passage that has led to an increase in the carbon dioxide emissions by Mpumalanga province. (2)

3.1..2 Suggest ONE reason why this province needs to find ways to decrease the carbon dioxide emissions. (1)

3.1.3 Explain ONE other activity not mentioned in the passage that may have contributed to Mpumalanga province having the highest carbon dioxide emission. (2)

3.1.4 Suggest ONE alternative energy source that is less harmful to the environment. (1)
(6)

[15]

3.2 An investigation was conducted to determine the effect of smoking in males on the risk of lung cancer.

The following procedure was followed:

- 40 males were selected to be part of the investigation
- Only males who regularly smoke were included
- All males were of the same age group
- The males in the investigation smoke the same type of cigarette

Their risk of developing lung cancer was measured and recorded.

The following results were obtained from the investigation.

Number of cigarette smoked daily	Risk of lung cancer (%)
10	20
20	30
30	55
40	80
More than 40	85

3.2.1 State the independent variable for the investigation. (1)

3.2.2 State the hypothesis for this investigation. (2)

3.2.3 List TWO ways how the validity of this investigation was increased. (2)

3.2.4 Other than repeating the investigation, state ONE way in which the reliability of the results could be increased. (1)

3.2.5 Smoking has a potential to destroy cilia in the breathing system.

Explain the effect on the breathing system when cilia is destroyed. (3)
(9)

[15]

TOTAL SECTION B 30

Copyright reserved

SECTION C

QUESTION 4

Define food security and discuss the impact of the loss of the of wild crop varieties on the gene pool and the positive effect of genetically engineered foods on food security. Also, discuss the effect of using excess fertilizers on biodiversity in an aquatic ecosystem (17)

Content : (3)
Synthesis: **(20)**

NOTE: NO marks will be awarded for answers in the form of tables, flow charts or diagrams.

TOTAL SECTION C: 20

GRAND TOTAL: 60

Copyright reserved

education

Department:
Education
PROVINCE OF KWAZULU-NATAL

LIFE SCIENCES

MARKING GUIDELINE

SEPTEMBER 2019

NATIONAL SENIOR CERTIFICATE

GRADE 11

MARKS: 60

TIME: 1 hour

This marking guideline consists of 5 pages.

Copyright reserved

SECTION A

QUESTION 1

1.1

1.1.1 A ✓✓
1.1.2 D ✓✓
1.1.3 B ✓✓
1.1.4 B ✓✓
1.1.5 C ✓✓ (5 x 2) **(10)**

SECTION B

QUESTION 2

2.1 (1)

2.1.1 Nephron✓ (2)

2.1.2 (a) E✓ – renal capsule✓ (2)
(b) C✓ – pelvis ✓ (2)
(c) F✓ – pyramids✓

2.1.3
- ADH increases the permeability of the walls of distal convoluted tubules and collecting tubules✓
- causing more water to leave the filtrate by osmosis to the medulla✓
- from where it is reabsorbed back into the blood capillaries✓ (3)

(any correct THREE) **(10)**

2.2

2.2.1 Invasive alien plants are plants not naturally occurring in that area✓/ not native but were introduced to an area (1)

2.2.2 - They absorb more water decreasing✓water availability (1)

2.2.3
- Equipment needed to remove these plants✓is expensive
- more money will be used to buy equipment✓/hire people to remove these plants
- thus decreasing✓the country's economy (3)

(5)

[15]

Copyright reserved

QUESTION 3

3.1

3.1.1
- Coal power stations✓
- Industries✓ (2)

3.1.2 To prevent an increase in atmospheric temperatures✓/to prevent global warming/to prevent the enhanced greenhouse effect (1)

3.1.3
- deforestation✓occurred
- decreasing carbon dioxide absorption by plants✓
- use of vehicles✓/Transport of products
- release carbon dioxide into the atmosphere✓
- coal mines✓
- release carbon dioxide into the atmosphere✓ (2)

(mark first ONE explained only)

3.1.4 Wind power✓/solar panels/wave energy/bio-fuels/natural gas (1)
(6)

3.2

3.2.1 Number of cigarettes smoked daily✓ (1)

3.2.2 Increase in the number of cigarettes smoked daily increase the risk of lung cancer✓✓

Or

Increase in the number of cigarettes smoked daily decrease the risk of lung cancer✓✓

Or

Increase in the number of cigarettes smoked daily has no effect on the risk of lung cancer ✓✓ (2)

3.2.3
- only males were used in the sample ✓
- all males were of the same age group✓
- all males were regular smokers✓
- all males were given the same type of cigarette✓ (2)

(mark first TWO only)

3.2.4 By increasing the number of male participants✓/use more than 40 participants. (1)

3.2.5
- Foreign substances such as dust will not be removed efficiently✓
- gaseous exchange surface may be infected✓
- leading to a poor supply of oxygen✓ (3)

(9)

[15]

Copyright reserved

SECTION C

QUESTION 4

Food security
- Access by all people✓
- to enough✓/adequate
- healthy✓/nutritious/quality food
- at all times✓ **Any 3**

Impact of the loss of wild varieties
- Selectively bred crops/ hybrid crops have desirable✓ characteristics
- They are grown in large numbers✓/monoculture of the crops
- therefore, the wild variety of that crop are decreasing in numbers✓/no longer available
- When the environment changes✓, the selectively bred crops may not adapt✓
- since the gene pool is decreased. ✓
- therefore food security decrease✓

Effect of genetically engineered foods
- Genetically engineered foods are foods derived from organisms where specific changes are made to their DNA✓
- Genetically engineered foods are beneficial as they are drought resistant✓/ herbicide tolerant/ pest resistant/ disease resistant/ longer shelf life/ etc.
- Making more food available✓
- therefore increasing✓ food security **Any 8**

Effect of excess fertilizers on biodiversity
- Excessive use of fertilizers increases the nutrient content✓of the surrounding river/
- Eutrophication occurs✓
- This causes an overgrowth of algae/ algal blooms✓
- The algae forms a dense mat which blocks out sunlight✓
- reducing photosynthesis✓
- Plants and animals depending on them die✓
- increasing decomposition✓
- leading to depletion of oxygen✓ **Any 6**
- water becomes polluted✓
- and reducing biodiversity✓

Content: **(17)**
Synthesis : **(3)**

Copyright reserved

ASSESING THE PRESENTATION OF THE ESSAY

RELEVANCE	LOGICAL SEQUENCE	COMPREHENSIVE
All information provided is relevant to the topic	Ideas arranged in a logical/ cause effect sequence	Answered all aspects required by the essay in sufficient detail
All information is relevant to: - food security definition - wild varieties and GM foods - effect of excess fertilizers There is no irrelevant information	Ideas are presented in a logical sequence with regards to: - food security definition - wild varieties and GM foods - effect of excess fertilizers	All aspects are answered Comprehensively as follows: - food security definition **(2/3)** - wild varieties and GM foods **(5/8)** - effect of excess fertilizers **(4/6)**
1 mark	1 mark	1 mark

NOTE: NO marks will be awarded for answers in the form of tables, flow charts or diagrams.

TOTAL SECTION C: 20

GRAND TOTAL: 60

Copyright reserved