KWAZULU-NATAL PROVINCE

EDUCATION
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 11

LIFE SCIENCES

COMMON TEST

SEPTEMBER 2023

MARKS: 50

TIME: 1 hour

N.B. This question paper consists of 8 pages.

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.

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 1.1.3) in the ANSWER BOOK, for example 1.1.4 D

1.1.1 The sequence of processes responsible for the composition of urine and volume of urine is …

A Reabsorption, excretion and ultra-filtration.
B Excretion, ultra-filtration and reabsorption.
C Excretion, reabsorption and ultra-filtration.
D Ultra-filtration, reabsorption and excretion

1.1.2 Which statement best describes the relationship between a parasite and its host?

A The host is harmed while the parasite benefits
B The parasite is harmed while the host benefits
C Both host and parasite benefit
D The parasite benefits and the host is not harmed

1.1.3 The blood vessel that transport blood with oxygen and nutrients into the kidney is the …

A Renal artery
B Superior vena cava
C Pelvis
D Renal vein (3 x 2) **(6)**

1.2 Give the correct **biological term** for each of the following descriptions. Write only the term next to the question number (1.2.1 to 1.2. 3)in the ANSWER BOOK.

1.2.1 The removal of nitrogenous waste material from the body.

1.2.2 Temporary movement of organisms into or out of an area due to seasonal changes in resources.

1.2. 3 The type of competition between members of different species.

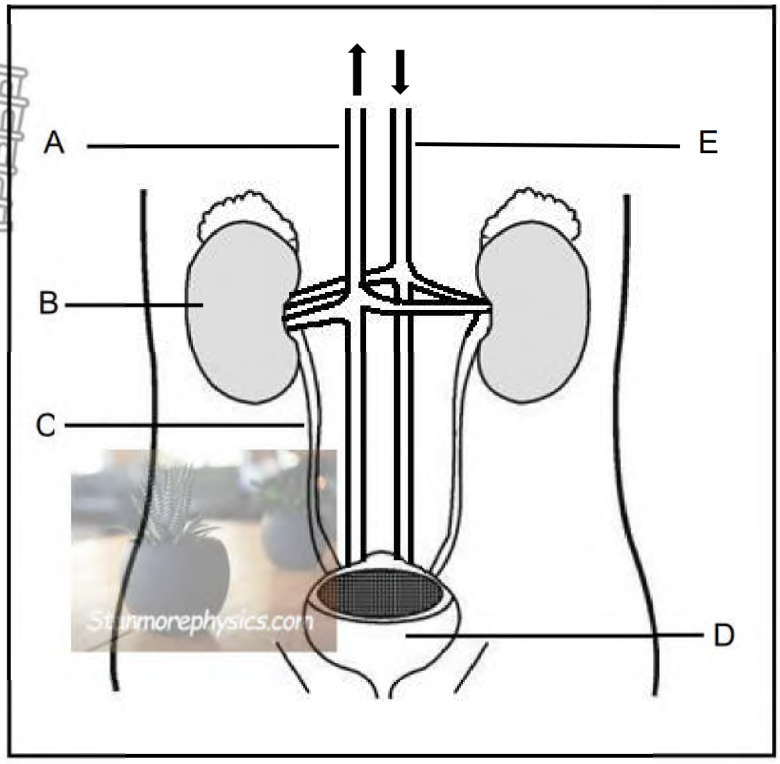
(3 x 1) **(3)**

1.3 Indicate whether each of the descriptions in COLUMN I applies to **A ONLY, B ONLY, BOTH A AND B** or **NONE** of the items in COLUMN II. Write **A only**, **B only**, **both A and B** or **none** next to the question number (1.3.1 to 1.3.2) in the ANSWER BOOK.

	COLUMN I	COLUMN II
1.3. 1	A group of organisms of the same species occupying the same habitat at the same time.	A: Population B: Community
1.3.2	Doubling of the population size at different intervals.	A: Geometric growth B: Natality

(2 x 2) **(4)**

1.4 The diagram below represents excretory system in a human body.



1.4.1 Identify part:

(a) A (1)

(b) B (1)

(c) C (1)

1.4.2 Give the LETTER and NAME of the:

(a) blood vessel that transports oxygenated blood directly into the kidney. (2)

(b) part that collects and stores urine temporarily. (2)

(7)

SECTION B

QUESTION 2

2.1 The passage below relates to symbiotic relationships between different organisms.

> Hyenas hunt in packs. They take down their prey by biting and dragging it to the ground, because they are fast predators. They tackle prey that are fast runners and are also able to kill an animal too large for one hyena. Zebras are one of the major prey of hyenas.

2.1.1 Give TWO reasons mentioned in the extract why hunting in packs makes hyenas successful hunters. (2)

2.1.2 Name the type of relationship shown between hyenas and zebras? (1)

2.1.3 Zebras live in herds.

Explain ONE reason why living in herds is an advantage. (2)

2.1.4 Explain why the chances of the zebra and hyena populations reaching carrying capacity are limited. (3)

(8)

2.2 The table below shows rate and depth of breathing in a healthy individual during a four minute strenuous exercise.

Time of exercise (minutes)	Rate of breathing (number of breaths per minute)	Depth of breathing per minute (litres)
1	15	25
2	25	35
3	33	42
4	45	60

2.2.1 State the relationship that exist between the time of exercise and the rate of breathing? (1)

2.2.2 Calculate the percentage increase in the depth of breathing between 1 and 4 minutes? Show ALL your workings. (2)

2.2.3 Describe the homeostatic mechanism that causes the rate and depth of breathing to increase during strenuous exercise. (4)

(7)

TOTAL QUESTION 2: [15]

QUESTION 3

3.1 A researcher wanted to determine the size of the snail population in a garden. 50 snails were randomly collected. Each snail was marked and then returned to the garden. A week later she caught 75 snails and found that 15 had been marked.

3.1.1 Calculate the size of the snail population. Show ALL your calculations.

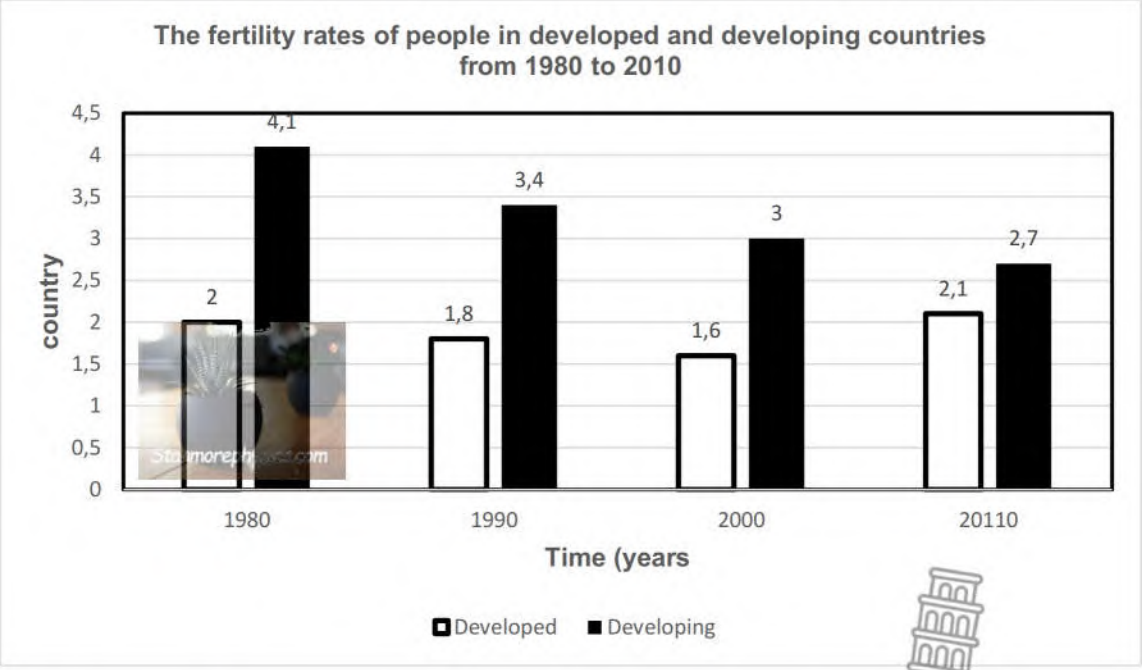
Formula: $P = \frac{F \times S}{M}$

P = Estimated total number of snails in the population.
F = Number caught and marked in the first catch.
S = Number caught in the second catch.
M = Number marked in the second catch. (3)

3.1.2 Name the method used above to determine the population size. (1)

(4)

3.2 The graph below shows a comparison between the fertility rates of people in developed and developing countries from 1980 to 2010.



3.2.1 Describe the trend in fertility rate for developed countries. (2)

3.2.2 Tabulate ONE difference between developed and developing countries with regards to life expectancy. (3)

(5)

3.3 Grade 11 learners conducted a survey using information from statistics to determine the effect of smoking on lung cancer.

The procedure for the investigation was as follows:

- 200 males were selected.
- Only males who are regular smokers were selected.
- All males were of the same age group.
- All males were smokers.
- The investigation was repeated.

The table below shows the result of their investigation.

Cigarette smoked daily	Risk of lung cancer (%)
15	5
25	15
30	21
35	30

3.3.1 Identify the:

(a) independent variable (1)

(b) dependent variable (1)

3.3.2 State TWO factors that were taken into consideration in the selection of participants. (2)

3.3.3 Give TWO reasons why the results at the end of the investigation may be considered reliable. (2)

(6)

TOTAL QUESTION 3: (15)

GRAND TOTAL: [50]

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MARKING GUIDELINE

MARKS: 50

TIME: 1 hour

This marking guideline consists of 4 pages.

SECTION A

QUESTION 1

1.1

1.1.1 D✓✓
1.1.2 A✓✓
1.1.3 A✓✓

(3 x 2) **(6)**

1.2

1.2.1 Excretion✓
1.2.2 Migration✓
1.2.3 Interspecific competition✓

(1 X 3) **(3)**

1.3

1.3.1 A only✓✓
1.3.2 A only✓✓

(2 x 2) **(4)**

1.4 1.4.1 (a) renal vein✓ (1)

(b) kidney ✓ (1)

(c) ureter) ✓ (1)

1.4.2 (a)E✓ - renal artery✓ (2)

(b)D ✓ - urinary bladder✓ (2)
(7)

TOTAL MARKS SECTION A: 20

SECTION B

QUESTION 2

2.1 2.1.1
- they can tackle prey too fast for them✓
- they can capture prey too large for them✓

(mark first TWO only) (2)

2.1.2 Predator-prey✓ relationship (1)

2.1.3
- large numbers mean that an individual is less likely to be caught by predator✓ / prey have a better opportunity to escape
- as there are many eyes to spot a predator✓/as running in herds may reduce the ability of a predator to focus on one individual to attack (2)

2.1.4
- running in herds intimidates the predator✓
- thus, making the prey less endangered✓/ vulnerable
- if the prey numbers increase the predator numbers will increase✓
- causing the prey numbers to decrease✓ (3)
- which will cause the predator numbers to decrease✓ Any **(8)**

2.2 2.2.1 As the time of exercise increase, the rate of breathing also increases✓ (1)

2.2.2 $\frac{60-25}{25} \times 100$✓ = 35

140✓% (2)

2.2.3
- During strenuous exercise the carbon dioxide level in the blood increases✓
- Receptor cells in the (carotid) artery in the neck/aorta are stimulated✓
- to send impulses to the medulla oblongata✓
- The medulla oblongata sends an impulse to the breathing muscles✓
- to contract more actively✓
- and increase the rate/depth of breathing✓
- An impulse is also sent to the heart to beat faster✓
- More carbon dioxide is taken to the lungs✓/exhaled (4)
- The carbon dioxide levels return to normal Any **(7)**

TOTAL QUESTION 2 15

QUESTION 3

3.1 3.1.1

$P = \frac{FXS}{M}$

$= \frac{50 \times 75}{15}$ ✓✓

= 250 ✓ snails (3)

3.1.2 Mark-recapture ✓method (1)
(4)

3.2 3.2.1 The fertility rate decreased from 1980 to year 2000✓ and then increased in year 2010✓ (2)

3.2.2

	✓
Developed countries	**Developing countries**
Longer life expectancy	Lower life expectancy

2 + 1mark for the table

(3)
(5)

3.3 3.3.1 (a) smoking✓ (1)

(b) lung cancer✓ (1)

3.3.2
- Gender ✓
- Smokers✓
- Age ✓

(mark first TWO only) (2)

3.3.3
- 200 males were used✓ / A large sample size
- The investigation was repeated✓

(mark first TWO only) (2)
(6)

TOTAL QUESTION 3 [15]
TOTAL SECTION B [30]

TOTAL ARKS [50]