



GRADE 11 EXAMINATION
NOVEMBER 2007

**LIFE SCIENCES: PAPER II
SECTION A**

NAME

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Time: 2½ hours

Total marks: Section A = 50, Section B & C = 100

SECTION A

Answer all the questions from this section in the spaces provided in this booklet.

QUESTION 1

1.1 Match the description in List X to the term in List Y, by writing the letter of the answer in the space provided.

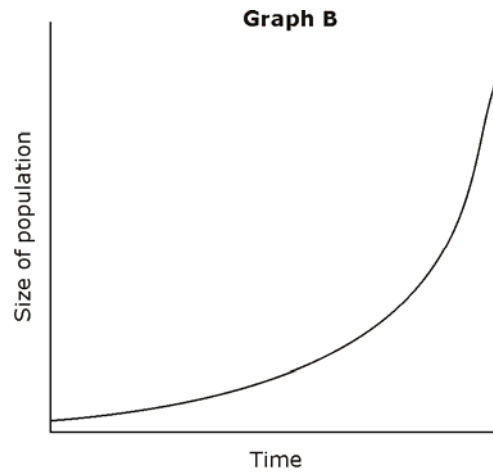
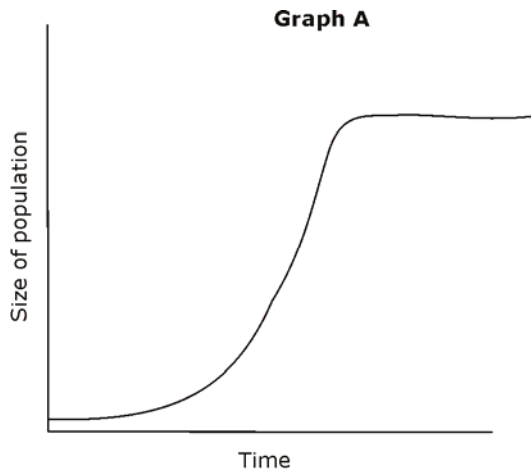
**LIST X
DESCRIPTION**

- [] The number of individuals that the environment can support without becoming degraded.
- [] The struggle for existence between members of a community caused by the limited supply of an essential resource.
- [] Green plants that make food by photosynthesis.
- [] The type of competition between members of different species.
- [] Measure of the number of new individuals produced by a population during a certain length of time.
- [] Group of individuals of the same species living in a particular area at the same time.
- [] Factors that affect the size of a population and which depend on the population density.
- [] The type of competition between members of the same species.
- [] The total amount of energy trapped in plants during photosynthesis.
- [] Factors of the environment that affect the size of a population and which do not depend on the population density.

**LIST Y
TERM**

- A. Population
- B. Competition
- C. Density-independent
- D. Natality
- E. Producers
- F. Intra-specific
- G. Carrying capacity
- H. Gross production
- I. Density-dependent
- J. Inter-specific

1.2 Two typical graphs of the ways populations grow are shown below. In the table below each graph, you are asked to provide a comparison. Write the answer "yes" or "no" in the appropriate spaces in the table for question 1 to 9. Write an appropriate name in your answer for question 10.



Factors being compared	Graph A	Graph B
1. J-shaped graph shown		
2. Graph shows growth of a K-strategy species		
3. Graph shows population growth with a decelerating phase		
4. Graph has a lag phase		
5. Population reaches carrying capacity		
6. Population growth is affected by environmental resistance		
7. Graph shows population density		
8. Graph can show human population growth for the last 100 years		
9. Graph has an equilibrium phase		
10. Name of this type of population growth form		

[20]

1.3 Choose the correct answer for each of the following multiple choice questions. Write the letter of your choice in the appropriate box below.

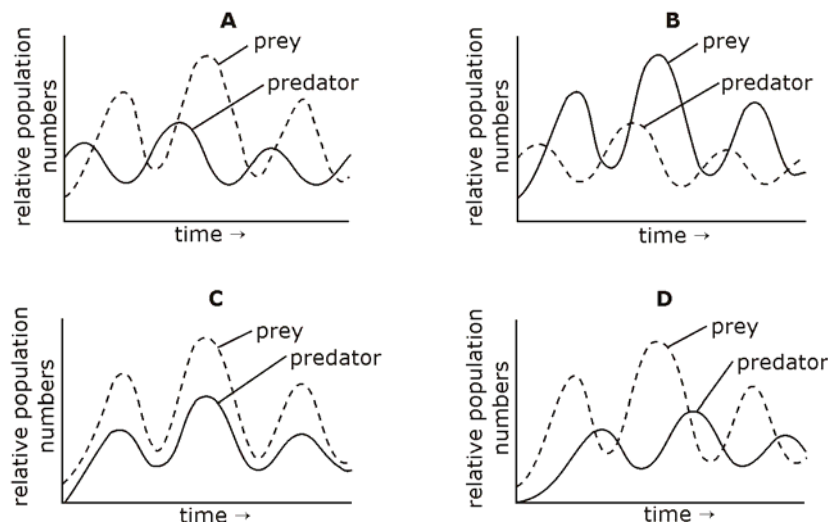
Question	1.3.1	1.3.2	1.3.3	1.3.4	1.3.5	1.3.6	1.3.7	1.3.8	1.3.9	1.3.10
Answer										

[10 × 2 = 20]

1.3.1 Which of the following is a density-independent factor?

- A An increase in competitors, decreasing the yield of crop species
- B An increase in food supply, increasing the numbers of herbivores
- C A decrease in temperature, increasing the abundance of a tree species
- D A decrease in predators, increasing the number of prey species

1.3.2 Which of the following graphs best represents a typical predator-prey relationship?



1.3.3 Which of the following has contributed to the rapid increase in human population size in the last 200 years or so?

- A Increase in the number of effective cures for diseases
- B Increase in child mortality in developing countries
- C Decrease in food availability in dry regions of the world
- D Decrease in levels of pollution

1.3.4 Which of the following does **not** tend to reduce biodiversity in an ecosystem?

- A Atmospheric pollution
- B Habitat conservation
- C Disruption of food webs
- D Selective feeding of low population species

1.3.5 The following table shows the effect of pollution on the biodiversity of a river.

	-----Direction of flow of river water----- →			
	State of water			
	Clean	Very badly polluted	Partly polluted	Clean
Biodiversity present in ecosystem	Large number of different species	X	Small number of different species	Large number of different species

↑
Untreated sewage added

Which of the following should have been inserted into box X in the table?

- A Very large number of different species
- B Large number of different species
- C Small number of different species
- D Very small number of different species

1.3.6 A quantity of pesticide was accidentally spilt into a river. After a period of time, which of the aquatic organisms would contain the highest concentration of pesticide?

- A Pondweed
- B Tadpoles
- C Small fish
- D Large fish

1.3.7 Read the passage below titled "Sea lion walks with pupils"

Sea lion walks with pupils

San Francisco – An 84-kilogram sea lion that was hand-reared and then released into the sea noticed a group of children on a walk-a-thon and joined in.

The children were doing laps around a course set up at the Marine Country Day School next to the shores of the San Francisco Bay when the sea lion, known as Astro, joined them and did a whole lap.

Astro loves human company. Each time the Marine Mammal Centre fetches him and returns him to the sea, he returns to find people.

[Adapted: The Herald May 18, 2007]

Which of the following is the most probable scientific explanation for Astro's behaviour in the statement "Astro loves human company"?

- A Learned behaviour has caused Astro to seek human company
- B Astro prefers being with people rather than swimming in the sea
- C Hand rearing Astro has resulted in Astro associating humans with food supply
- D Innate behaviour has caused Astro to seek human company

1.3.8 Desertification is the process by which

- A people try to cultivate land near a desert.
- B fertile land changes to barren land or desert.
- C people abandon a rural way of life for city life.
- D large areas of natural forest are cleared for timber.

Questions 1.3.9 and 1.3.10 refer to the following information.

Some Grade 11 learners carried out an investigation to estimate the size of a striped field mouse population in an open grassy area near their school. They used the "mark-capture" technique as follows:

- They set out live-traps (which trap but do not kill animals) and caught 34 mice in the first capture.
- They stroked the mice to calm them.
- They marked each of the mice with a dab of bright yellow waterproof paint near the left ear before releasing them.
- A week later they put out live traps again and caught 50 mice in the second capture, 3 of which were marked.

1.3.9 Which of the following calculations would they have done to estimate the field mouse population size?

- A $\frac{50 \times 3}{54}$
- B $\frac{50 + 34}{3}$
- C $\frac{34 \times 50}{3}$
- D $34 \times 50 \times 3$

1.3.10 Which of the following are problems with the way the investigation was done?

- (i) Birth, death, immigration and emigration could have happened between the first and second capture.
 - (ii) The mice were stroked to calm them.
 - (iii) The bright yellow paint dab made the marked mice easily visible to predators.
 - (iv) The pupils used live traps.
- A (i), (ii) and (iii)
 - B (i), (iii) and (iv)
 - C (ii), (iii) and (iv)
 - D (i) and (iii)

Total: 50 marks

This is the answer page for SECTION B, QUESTION 2.3, on page 3.

Graph showing cat population on Marion Island

