

SCHOOL: Your school name

SENIOR FOUR BIOLOGY

END OF TERM EXAMINATION · FREE SAMPLE

Academic year: 20..... – 20.....

Date:/...../20.....

Name:

Class:

Duration: 2 hours

Total marks: 39

Content covered: Unit 1: Introduction to biodiversity · Unit 2: Introduction to classification · Unit 3: Microscopy · Unit 4: Cell structure and specialisation

INSTRUCTIONS

1. A full paper has THREE sections and 100 marks: A 55 marks (all questions), B 30 marks (any three of four), C 15 marks (one of two).
2. This free sample shows one extract of each section.
3. Write your answers in the answer booklet provided.
4. Use correct biological terms and draw labelled diagrams where they help.

SECTION A (extract of 55 marks)*Attempt ALL questions.*

1. Species evenness describes: (1 mark)

- A. the total area of a habitat sampled
- B. the age of an ecosystem in years
- C. the total number of species in an area
- D. how equal the numbers of each species are

2. A bacterial disease of animals that can spread to humans is: (1 mark)

- A. polio
- B. anthrax
- C. influenza
- D. measles

3. Using only the fine focus at high power prevents: (1 mark)

- A. stain from drying
- B. the light from switching off
- C. the objective crushing the slide
- D. the specimen from moving

4. Matching. Match each item in column A with the correct answer in column B. Write the letter in the answer column. (4 marks)

Column A	Answer	Column B
1. Lenses should be cleaned with:		a. number of legs
2. A sample gives n/N values 0.5, 0.3 and 0.2. Simpson's index is:		b. lens tissue
3. Bacteria that fix nitrogen in legume nodules are:		c. Rhizobium
4. A good feature to use in a key is:		d. 0.62

5. Fill in the blanks. Use the words in the box to complete the sentences. One word in the box is not needed. (3 marks)

mountain gorillas 1000 nanometres improve reliability introduce bias
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- (i) Sampling is repeated many times to
- (ii) Volcanoes National Park mainly protects
- (iii) One micrometre equals

6. Using the Gram stain, explain why *E. coli* stains pink and *Staphylococcus* stains purple. (4 marks)

SECTION B (extract of 30 marks)

Attempt any *THREE* questions.

7. Microscopy

(10 marks)

- (a) Compare TEM and SEM and say which you would use to study (a) the surface of an insect's eye; (b) the membranes inside a chloroplast. (4 marks)
- (b) (i) A virus is 100 nm across. Calculate the magnification needed to make it 10 mm in an image. [3] (6 marks)
- (ii) Explain whether a light microscope could resolve it. [3]

SECTION C (extract of 15 marks)

Attempt only *ONE* question.

8. Introduction to classification

(15 marks)

A health centre in Nyagatare reports cases of brucellosis among people who drink unboiled milk from cows.

- (a) State the type of organism that causes brucellosis. (1 mark)
- (b) Explain how people catch brucellosis from milk. (2 marks)
- (c) Suggest two ways to prevent brucellosis in families. (2 marks)
- (d) Why could antibiotics treat brucellosis but not a viral disease like rabies? (3 marks)
- (e) A farmer says boiling milk destroys its value. Is this a good reason to drink raw milk? Justify. (3 marks)
- (f) Plan a district campaign against zoonotic bacterial diseases. (4 marks)

END