



GOVERNMENT OF SAMOA

STUDENT EDUCATION NUMBER

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Samoa National Junior Secondary Certificate

BIOLOGY

2024

QUESTION and ANSWER BOOKLET

Time allowed: 3 Hours & 10 minutes

INSTRUCTIONS

1. You have 10 minutes to read **before** you start the exam.
2. Write your **Student Education Number (SEN)** in the space provided on the top right-hand corner of this page.
3. **Answer ALL QUESTIONS.** Write your answers in the spaces provided in this booklet.
4. If you need more space, ask the Supervisor for extra paper. Write your SEN on all extra sheets used and clearly number the questions. Attach the extra sheets to the appropriate places in this booklet.

STRANDS		Pages	Time (min)	Weighting
STRAND 1	VARIETY OF LIFE	2-6	36	20
STRAND 2	CELL BIOLOGY	7-11	36	20
STRAND 3	ANIMAL BIOLOGY	12-15	36	20
STRAND 4	PLANT BIOLOGY	16-20	36	20
STRAND 5	ENVIRONMENT	21-25	36	20
TOTAL			180	100

Check that this booklet contains pages 2-26 in the correct order and that none of these pages are blank.

HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

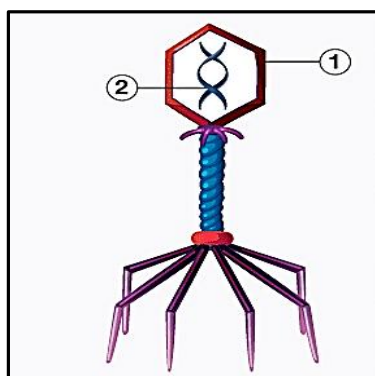
For Questions 1, 4, and 8, choose and write the LETTER of the correct answer in the box provided.

1. Which of the following is caused by the Human Immunodeficiency Virus (HIV)?

- A. Influenza
- B. Tuberculosis
- C. AIDS (Acquired Immunodeficiency Syndrome)
- D. Hepatitis A

SL 1

2. Using the diagram below, name the **TWO** basic virus structures labelled (1) and (2).



Source: <https://byjus.com/biology/virus/>

SL 2

3. List **TWO** symptoms associated with someone who has the mumps.

SL 2

4. Which of the following **BEST** defines antibiotics?

- A. Medications that boost the body's immune response to pathogens.
- B. Drugs used to prevent viral infections by directly attacking viruses.
- C. Substances that kill or inhibit the growth of bacteria.
- D. Compounds designed to neutralize toxins produced by pathogens.

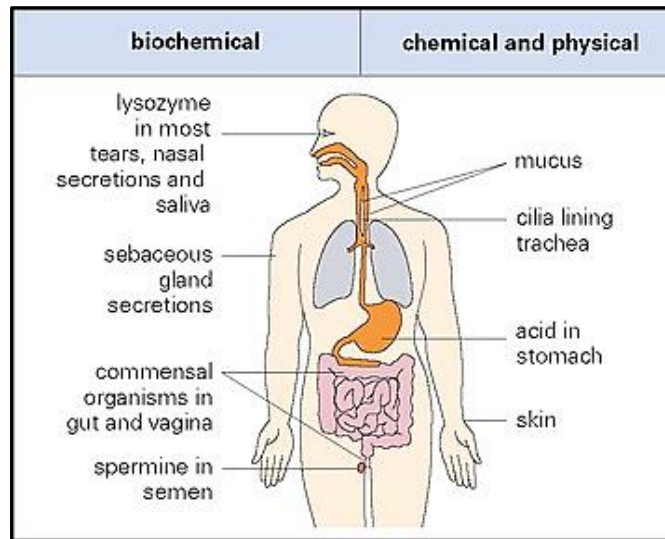
☐

SL 1

5. A hospital patient gets a bacterial infection, but antibiotics don't work because of resistance. Explain how antibiotic resistance develops in pathogens and **TWO** ways to prevent it.

SL 3

6. The picture below illustrates the outer defenses that germs and bacteria must get through before entering the body. Discuss how the skin and mucus fight pathogens.



Source: <https://basicmedicalkey.com/the-innate-defences-of-the-body/>

Skin: _

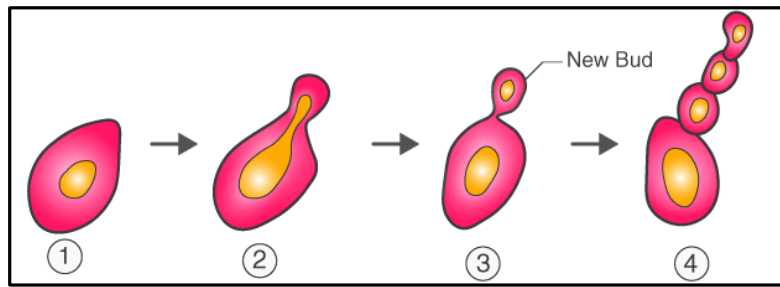
SL 4

Mucus:

7. Discuss how vaccinations contribute to public health and give **TWO** examples of common vaccines and the diseases they prevent.

[illegible]

9. The diagram below illustrates how yeast reproduces. Use the diagram to describe yeast reproduction.

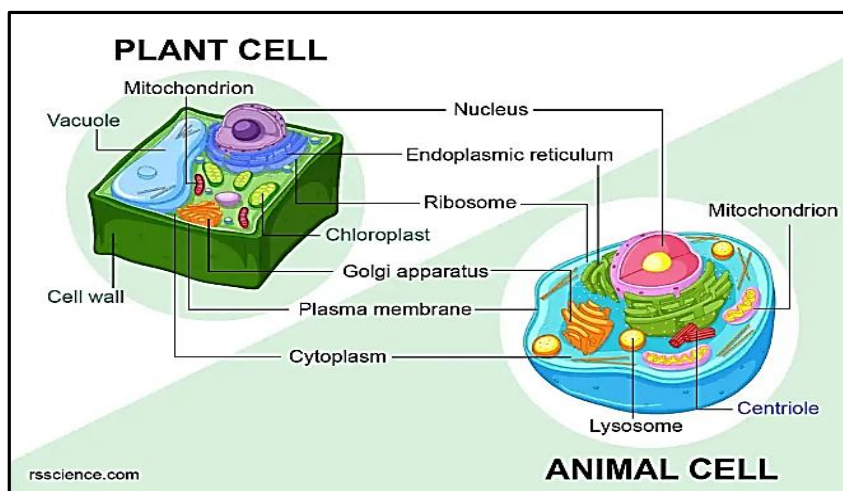


Source: <https://byjus.com/biology/studying-binary-fission-in-amoeba-and-budding-in-yeast-with-the-help-of-prepared-slides/>

SL 2

For Question 10, choose and write the LETTER of the correct answer in the box provided.

Use the diagram below to answer Questions 10 and 11.



Source: <https://rsscience.com/animal-cells-vs-plant-cells/>

10. The organelle responsible for producing the majority of the energy that is needed by the cell for carrying out various activities, and is found in both plant and animal cells is the:

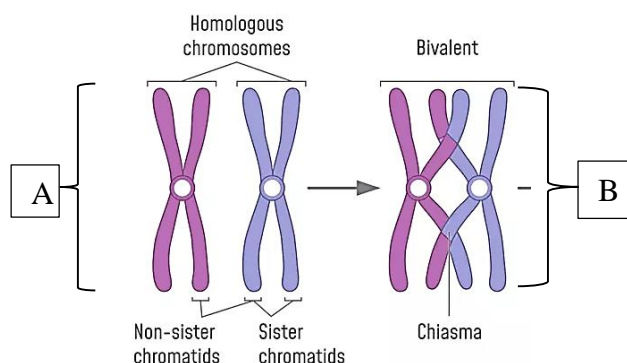
- A. nucleus.
- B. endoplasmic reticulum.
- C. ribosome.
- D. mitochondrion.

SL 1

11. Explain how **TWO** differences between plant and animal cells contribute to their respective functions and adaptations.

SL 3

Use the diagram below to answer Questions 12 and 13.



Source: <https://www.thoughtco.com/synapsis-definition-and-function-4795794>

12. The diagram above illustrates two important events in Prophase I of Meiosis I. List these **TWO** important events (A and B).

SL 2

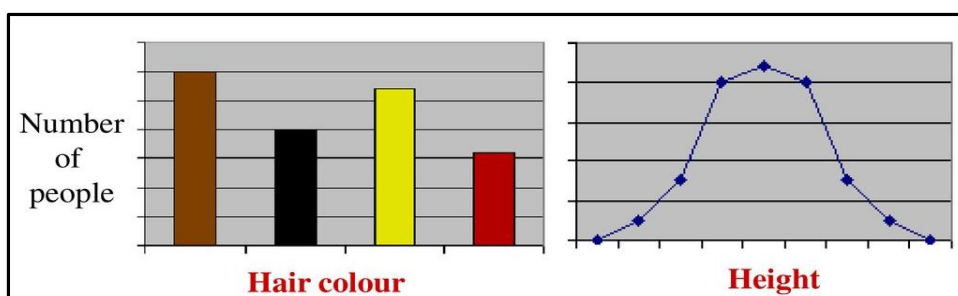
13. Explain the significance of event B in Meiosis.

SL 3

14. Explain why it is important for Meiosis to reduce the chromosome number during sexual reproduction and how this process results in genetic variation.

SL 3

The graphs below show examples of continuous and discrete variations.



Source: <https://slideplayer.com/slide/15090788/>

15. Describe the difference between the two continuous and discrete variations using the examples in the graphs above.

SL 2

16. In horses, the allele for straight hair (H) is dominant, and the allele for curly hair (h) is recessive. A horse breeder mates a homozygous dominant mother with a heterozygous male.

Fill in the following monohybrid cross to determine the genotypes of the offspring.

SL 2

For Questions 18 and 19, choose and write the LETTER of the correct answer in the box provided.

18. Which of the following functions is primarily associated with the gall bladder?

- A. Filtration of blood.
- B. Production of insulin.
- C. Storage and concentration of bile.
- D. Regulation of body temperature.

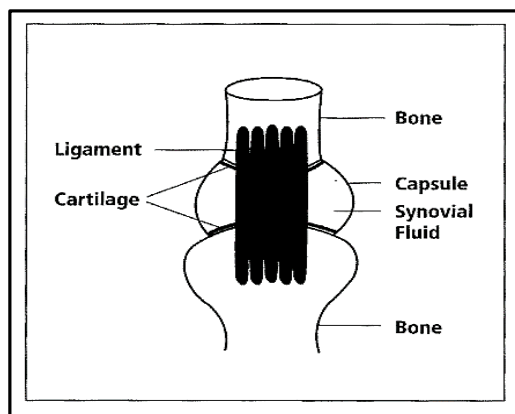
SL 1

19. Which of the following is a characteristic of a ball and socket joint?

- A. Allows bones to move up and down.
- B. Allows bones to move in multiple directions.
- C. Limits movement along one plane.
- D. Provides bones with structural support only.

SL 1

20. The diagram below shows a moveable joint in the human body.



Source: <https://www.mesc.gov.ws/wp-content/uploads/2020/03/Science-Year-10-Book-1.pdf>

Explain how the ligaments, cartilage, and synovial fluid aid in the movement of vertebrates.

SL 3

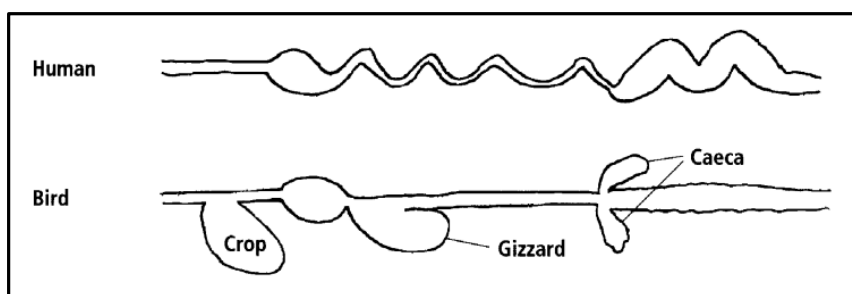
21. Explain by using an example what antagonistic pairs of muscles are and how they function.

SL 3

22. Describe arthritis and **ONE** symptom of this disease.

SL 2

Use the diagram below to answer Question 25.



Source: <https://www.mesc.gov.ws/wp-content/uploads/2020/03/Science-Year-10-Book-1.pdf>

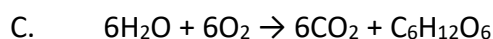
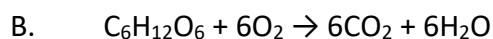
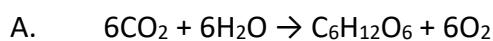
25. Compare the digestive system of humans and birds. Discuss the differences between these two digestive systems.

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SL 4

For Questions 26 to 28, choose and write the LETTER of the correct answer in the box provided.

26. Which of the following represents the chemical equation for photosynthesis?



SL 1

27. Where does translocation primarily occur in plants?

A. Roots

B. Leaves

C. Xylem

D. Phloem

SL 1

28. Which statement is correct about where photosynthesis and respiration occur in plant cells?

A. Photosynthesis primarily occurs in the chloroplasts, while respiration primarily occurs in the mitochondria.

B. Photosynthesis primarily occurs in the mitochondria, while respiration primarily occurs in the chloroplasts.

C. Both photosynthesis and respiration primarily occur in the nucleus.

D. Photosynthesis primarily occurs in the nucleus and chloroplasts.

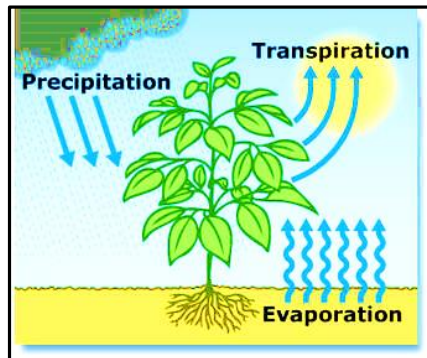
SL 1

29. Describe the flow of water through the plants from the soil. Include in your answer the vessel that carries water.

SL 2

30. Transpiration is the release of water vapour (gas) from the leaves of plants/trees.

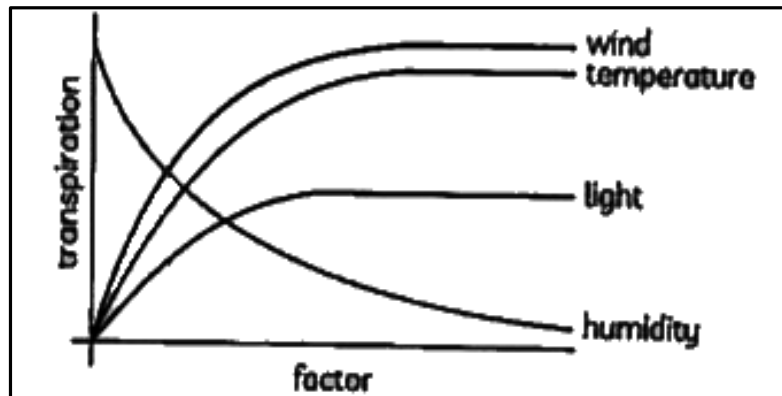
List **TWO** ways in which the transpiration process is important to the plant.



Source: <https://www.usgs.gov/special-topics/water-science-school/science/evapotranspiration-and-water-cycle>

SL 2

31. Interpret the graph below and discuss how the four factors affect the transpiration rate.



Source: <https://www.doubtnut.com/qna/648639019>

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper has a slight shadow on the right side, suggesting it's resting on a surface. There is no handwriting or other markings on the paper.

SL 4

32. Explain using examples the difference between active transport and passive transport of water in plants.

[illegible]

33. Discuss in detail **TWO** reasons why photosynthesis is important to plants and other living things.

34. Describe the function of a weight photometer.

SL 2

For Question 35, choose and write the letter of the correct answer in the box provided.

35. Which of the following is a key characteristic of an ecosystem?

- A. It consists only of living organisms.
- B. It is static and unchanging over time.
- C. It includes both biotic and abiotic factors.
- D. It is limited to a single species interacting with its environment.

10

SL 1

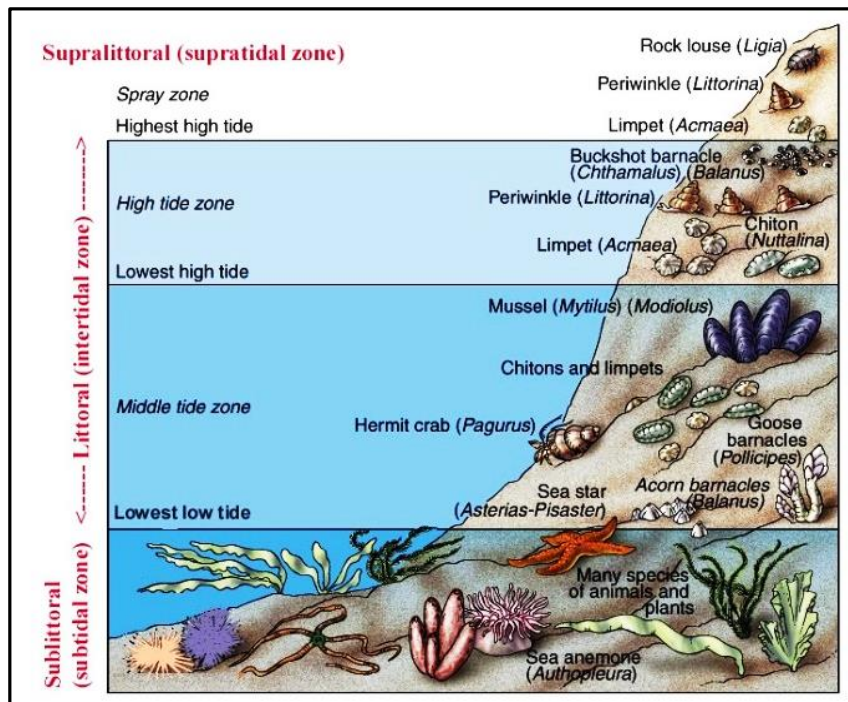
36. Explain how competition and predation contribute to maintaining balance in a community.

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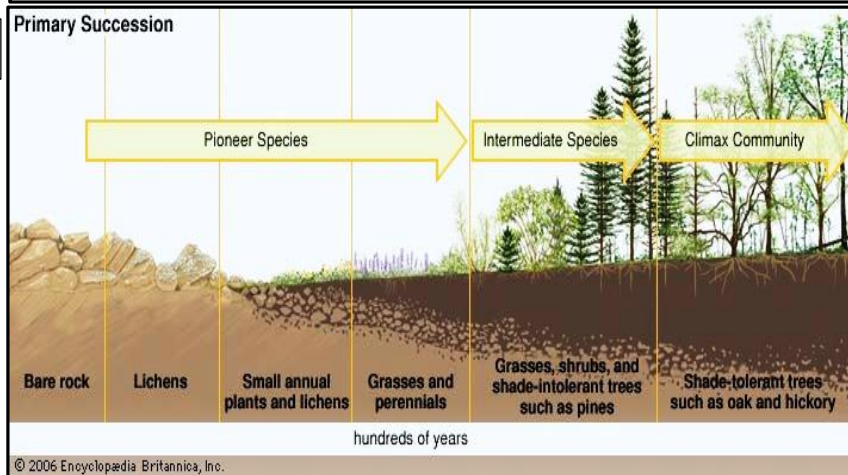
SL 3

37. Use the diagrams below to discuss at least **TWO** differences in the zonation and succession communities shown. Include in your answer definitions for both zonation and succession.

Zonation



Succession



Source: <https://newbreweress.weebly.com/stratification-zonation-succesion.html>

SL 4

38. The image below illustrates one of the serious problems that is affecting our environment here in Samoa which is pollution.

A photograph showing a large pile of discarded plastic waste, including bottles and cups, in the foreground. In the background, there is a large, modern orange building with a curved roof and several windows. A white car is parked on the left, and a dark car is parked on the right. A large tree trunk is visible on the right side of the frame.

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39. List **TWO** solutions to eliminate or reduce the pollution problem shown in Question 38.

SL 2

40. Rivers in Samoa are polluted by rubbish, waste, pesticides, and bacteria such as *E.coli* which can cause diarrhea and food poisoning. Describe **TWO** ways that show how you can improve the health of rivers in Samoa.

SL 2

STUDENT EDUCATION NUMBER									

SNJSC BIOLOGY

2024

(For Scorers only)

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STRAND 1	VARIETY OF LIFE	20			
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