GOVERNMENT OF SAMOA
MINISTRY OF EDUCATION, SPORTS AND CULTURE

STUDENT EDUCATION NUMBER									

Samoa National Junior Secondary Certificate

BIOLOGY

2022

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 at the appropriate places in this booklet.

STRANDS		Pages	Time (min)	Weighting
STRAND 1:	VARIETY OF LIFE	2-4	36	20
STRAND 2:	CELL BIOLOGY	5-8	36	20
STRAND 3:	ANIMAL BIOLOGY	9-12	36	20
STRAND 4:	PLANT BIOLOGY	13-17	36	20
STRAND 5:	ENVIRONMENT	18-22	36	20
TOTAL			**180**	**100**

Check that this booklet contains pages 2-23 in the correct order and that none of these pages are blank.

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

STRAND 1:	VARIETY OF LIFE	Weighting 20

For Questions 1 – 3, choose and write the LETTER of the correct answer in the box provided.

1. Salmonella is an example of a:

   A. virus.
   B. protista.
   C. fungus.
   D. host.

	SL 1

2. How do antibiotics work?

   A. Antibiotics kill bacterial cells.
   B. Antibiotics kill viruses.
   C. All of the above.
   D. None of the above.

	SL 1

3. How do vaccines protect people against disease infections?

   A. The body of the person given the injection makes antibodies against the pathogen.
   B. The body of the person given the injection makes antigens to be produced by the red blood cells.
   C. Vaccines introduce a live version of the pathogen.
   D. Vaccines kill the insect vectors responsible for the spread of infection.

	SL 1

4. Describe the fungal infection known as Athlete's foot and its symptom(s).

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SL 2

5. Describe **ONE** important role that microorganisms play in our environment.

SL 2

6. Bacteria are often described in terms of their general shape. Describe the shape that *Salmonella* and *Staphylococcus* have.

SL 2

7. Antibiotics have been developed over the course of many years, to target and kill bacteria that may cause diseases and infections, without seriously harming the patient/person being treated. Explain in detail the problem that is caused by using too many antibiotics.

SL 3

8. The human body has several ways to stop pathogens from entering and causing damage to our cells. Discuss in detail, **FOUR** different defenses our bodies have against pathogens and the part of the body it's found. E.g. eyelashes – prevent dust from entering the eye.

SL 4

9. Compost has a variety of benefits. Discuss in detail **TWO** benefits of compost. Include in your answer the definition of compost and examples of what materials/items can be used in compost.

SL 4

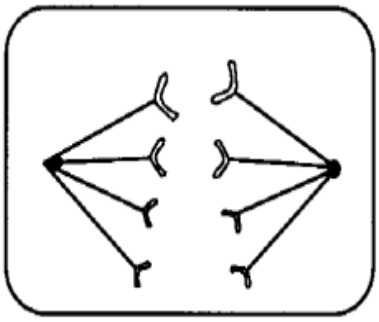
For Question 10, choose and write the LETTER of the correct answer in the box provided.

10. Identify the part of the microscope indicated by an arrow on the image below.

A. Fine focus.
B. Coarse focus.
C. Eyepiece (oculars) lens.
D. Light source.
E. Objective lens.

	SL 1

11. The diagram below is an illustration of one of the stages/phases in mitosis.
Identify the correct name and description of this stage/phase below.



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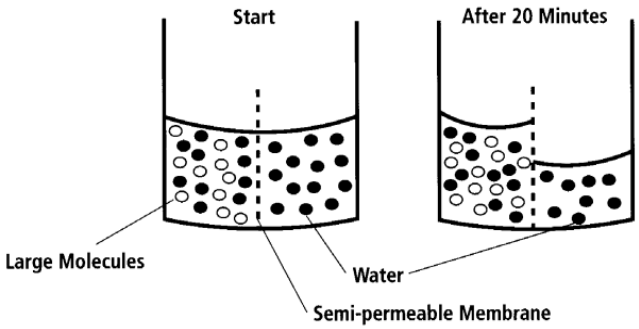
SL 2

12. Describe the process shown below AND its importance in plant cells.

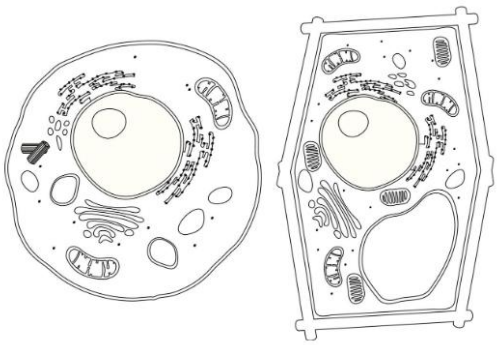


SL 2

13. Variation between individuals of a species can be grouped into two large categories: **discrete** and **continuous**. Describe and give an example of continuous variation.

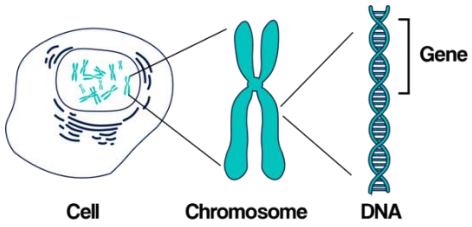
SL 2

14. The diagram below provides a brief comparison of plant and animal cells. Name the **TWO** structures present in plant cells but lacking in animal cells and describe their functions.



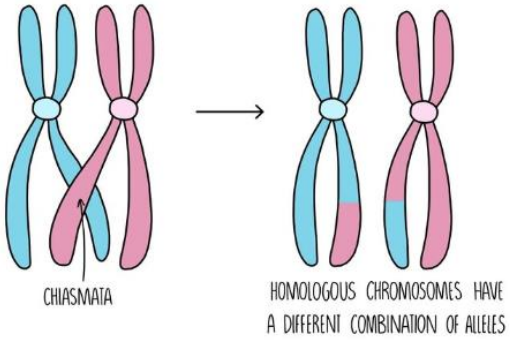
SL 3

15. Use the diagram below to explain the relationship between a chromosome, gene and DNA.



SL 3

16. Explain the process of crossing over in meiosis and **TWO** reasons as to why it is important.



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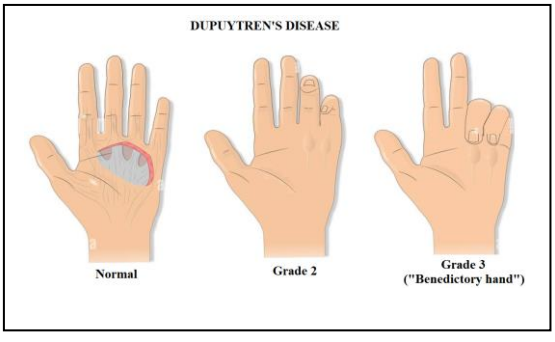
SL 3

17. Dupuytren is a hand deformity that develops over the year (see diagram below). A man with Dupuytren's (Dd) and a woman who does not have Dupuytren's (dd) plan to have a child. Complete the Punnett square below to show the possible genotypes of the child AND give the percentage of offspring with Dupuytren and offspring that are normal.

Mother

Father			



SL 4

Percentage of offspring with Dd _____

Percentage of offspring without Dd (normal) _____

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

18. The four processes carried out by the digestive system include:

A. Ingestion, digestion, absorption, and egestion.
B. ingestion, physical digestion, chemical digestion, and movement.
C. esophagus, stomach, small intestine, and large intestine.
D. esophagus, stomach, liver, and pancreas.
E. both A and C.

	SL 1

19. Muscles are arranged in pairs,

A. so, if one is injured, the other can take over.
B. doubling their strength.
C. because one pulls while the other pushes.
D. enabling them to perform opposing movements.
E. so, they can take turns contracting and resting.

	SL 1

20. Describe arthritis and where it usually occurs.

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SL 2

21. Describe the **TWO** processes represented by the two Rs in MRSCGREN.

SL 2

22. Explain **THREE** major functions of a skeleton.

SL 3

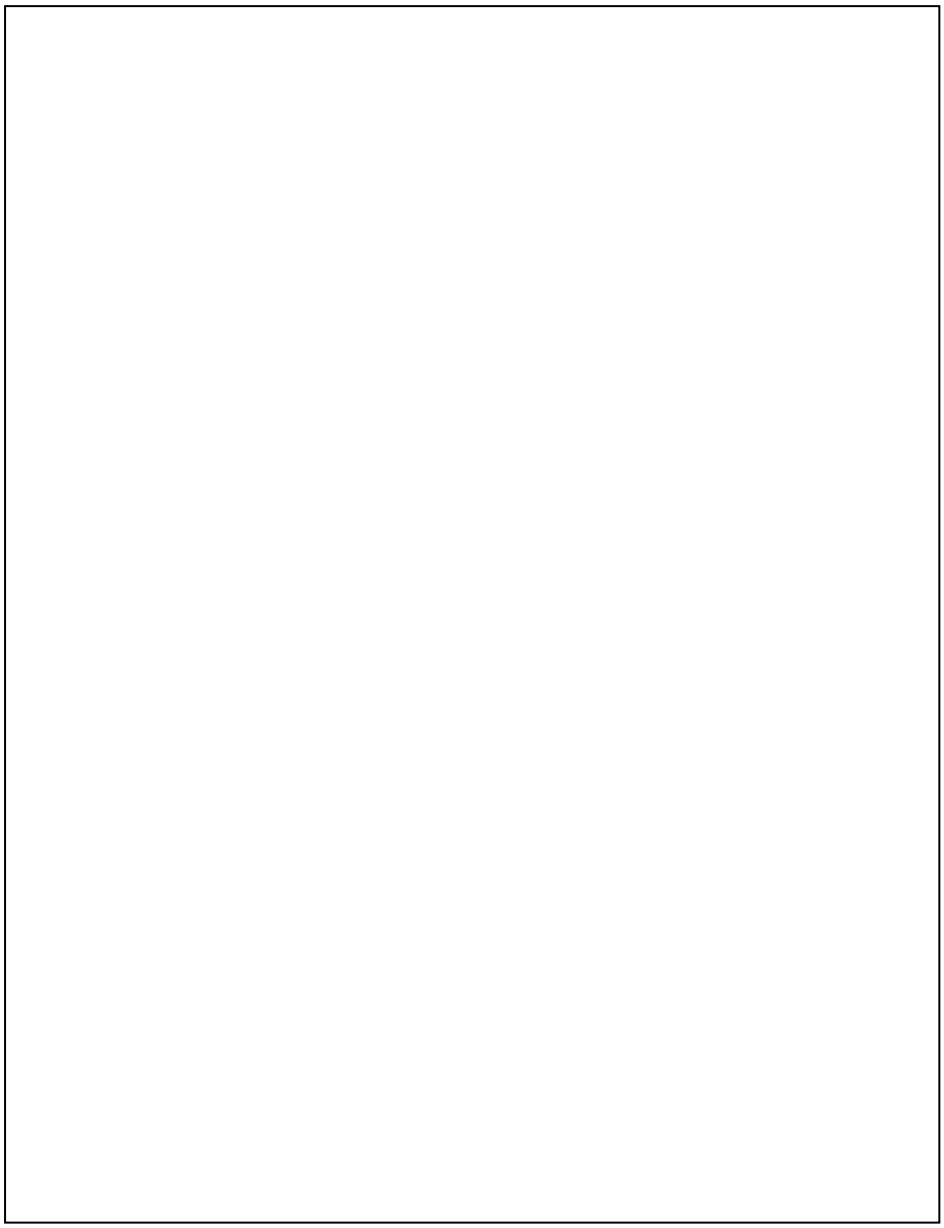
23. Diarrhea and constipation are two diseases that affect the digestive system. Explain the causes of these two digestive system diseases.

SL 3

24. Discuss **FOUR** methods that can be used to prevent diarrhea.

SL 4

25. Draw and label a diagram that illustrates the following organs – ***kidney, bladder, ureter***.



SL 4

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

26. The ultimate source of energy in the sugar molecules produced by photosynthesis is:

A. Sugar.
B. the Sun.
C. Oxygen.
D. ATP.
E. Chlorophyll.

	SL 1

27. Plants carry out photosynthesis in the chloroplast of the cell. In which part of the cell does respiration occur?

A. Vacuole.
B. Cell wall.
C. Mitochondria.
D. Chloroplast.
E. Ribosome.

	SL 1

28. Which of the following is **NOT** a factor that affects the rate of photosynthesis?

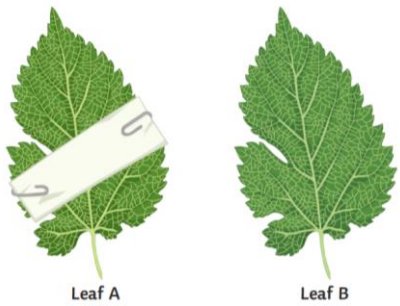
A. Light intensity.
B. Carbon dioxide concentrations.
C. Temperature.
D. Soil.
E. None of the above.

	SL 1

29. Explain the role of chlorophyll in photosynthesis. Include in your answer, where chlorophyll is found in plants.

SL 3

30. A student placed a plant into a dark cupboard and covered one leaf (leaf A) with a piece of card. After two days, she carried out a test for starch on leaf A, and one other leaf (Leaf B) that was not covered. Discuss the next step she would take to test leaf A and leaf B for starch. Also discuss the results you expect from this experiment.



SL 4

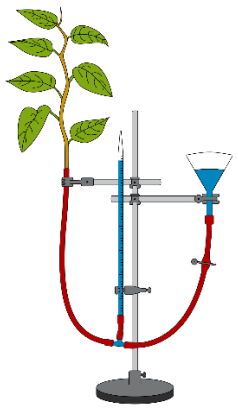
31. Describe the process of translocation. Mention in your answer the vascular tissue involved in this process.

SL 2

32. Describe the structure and function of the xylem.

SL 2

33. Identify the experimental setup below and describe what is being investigated.



SL 2

34. Discuss **FOUR** adaptations plants have in hot or dry environments.

SL 4

STRAND 5:	ENVIRONMENT	Weighting 20

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

35. A _____ is defined as a group of organisms of the same species that occupies a particular geographic area.

A. biosphere
B. ecosystem
C. community
D. population
E. cell

SL 1

36. Describe biological control and given an example here in Samoa.

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SL 2

37. Describe **TWO** ways in which pollution affects the environment.

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SL 2

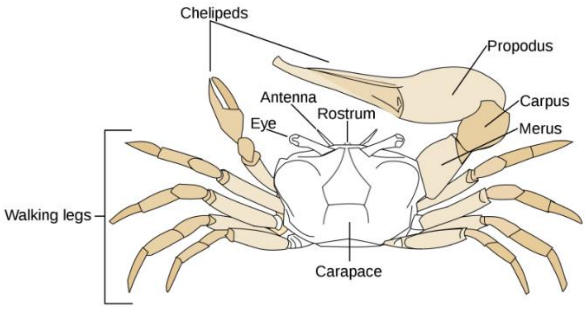
38. Deforestation, the cutting down of trees, is another environmental issue that is faced in Samoa. The removal of trees results into soil erosion, loss of habitats, flooding, and increased carbon dioxide in the atmosphere. Describe **TWO** methods to combat deforestation.

SL 2

39. Describe ecological tolerance.

SL 2

40. Using the picture of the crab below, identify and explain **THREE** adaptations that enables it to survive in the environment.



SL 3

41. Draw a food chain to show the flow of energy using the following organisms:

bird, cat, lettuce, caterpillar

Under each organism, identify the trophic level it represents.

SL 4

42. Discuss **TWO** ways in which your school has negatively contributed to the environment and **TWO** ways to address these issues.

SL 4

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(For Scorers only)

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