



Index Number:

NATIONAL CERTIFICATE OF EDUCATION

March / April 2021

BIOLOGY (N530)

TIME: 45 MINUTES

Candidates answer on the Question Paper.

Additional Material: Ruler

READ THESE INSTRUCTIONS FIRST

1. Write your index number in the space provided above.
2. Write in dark blue or black ink. Do not use correction fluid.
3. You may use a soft pencil for any diagram, graph or rough working.
4. Diagrams are not drawn to scale unless otherwise specified.
5. Any rough working should be done in this booklet.
6. Answer **ALL** questions.
7. This document consists of **5** questions printed on **9** pages.
8. The number of marks is given at the end of each question or part question.
9. The total number of marks for this paper is **50**.

For Examiners' use							
Question No.	1	2	3	4	5	Total	Signature
Marker							
Team Leader							
Quality Controller							
CE/ACE							

Question 1 (10 marks)**Circle the correct answer.**

1. Which one of the following is a **non-communicable** disease?
 - A Stroke
 - B Syphilis
 - C Gonorrhea
 - D Influenza

2. Which part of human blood fights against foreign bodies?
 - A Plasma
 - B Red blood cells
 - C White blood cells
 - D Platelets

3. Which of the following gases causes acid rain?
 - A Carbon monoxide
 - B Sulfur dioxide
 - C Oxygen
 - D Hydrogen

4. What is meant by the term **biodiversity**?
 - A The place where different species live.
 - B The variety of species in a defined area.
 - C The conditions in which different species live.
 - D The number of organisms of the same species.

5. Which process, harmful to the environment, is shown in **Figure 1.1**?

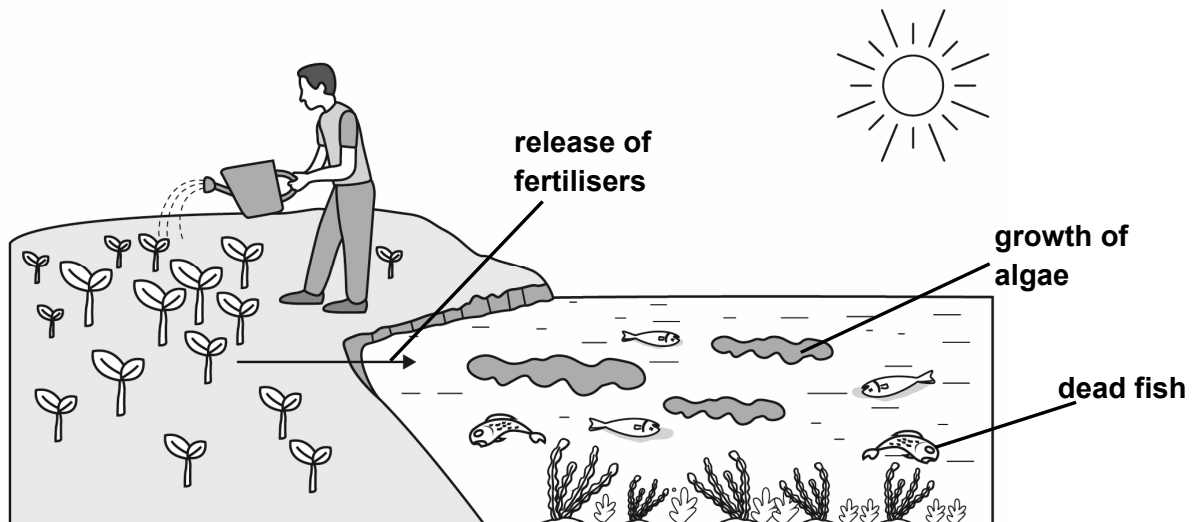


Figure 1.1

- A** Global warming
- B** Ozone depletion
- C** Deforestation
- D** Eutrophication
6. What are invasive alien species?
- A** Exotic species which affect native species.
- B** Endemic species found naturally in a specific region.
- C** Species that have become extinct.
- D** Species that are endangered.
7. Carbon dioxide enters a leaf by the process of diffusion.
What happens to particles during diffusion?
- A** They move from a region of high concentration to a region of low concentration.
- B** They move from a region of low concentration to a region of high concentration.
- C** They move from a hot region of the leaf to a cold one.
- D** They move from a cold region of the leaf to a hot one.

8. What is a male sex cell called?
- A Penis
 - B Scrotum
 - C Sperm
 - D Testis
9. Which of the following actions would help control the spread of HIV?
- A Carrying out regular physical exercise.
 - B Using protection during sexual contact.
 - C Washing hands regularly.
 - D Eating healthy food.
10. **Figure 1.2** shows steps in the fertilisation process.

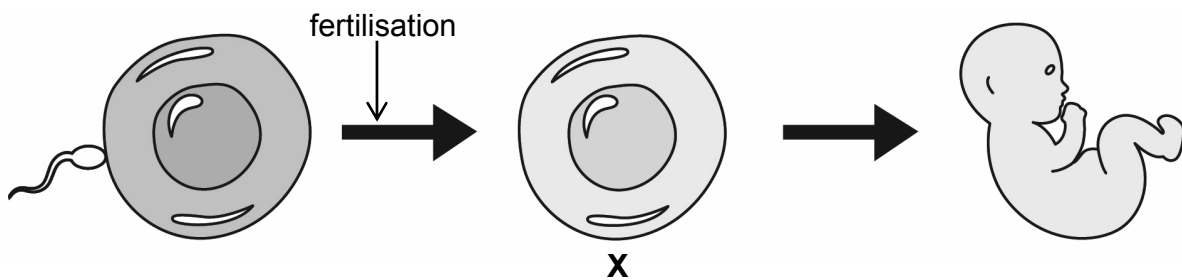


Figure 1.2: Steps in the fertilisation process.

In **Figure 1.2**, Diagram **X** shows the

- A embryo
- B foetus
- C ovum
- D zygote

Question 2 (8 marks)

Figure 2.1 shows the skeleton of a leaf.

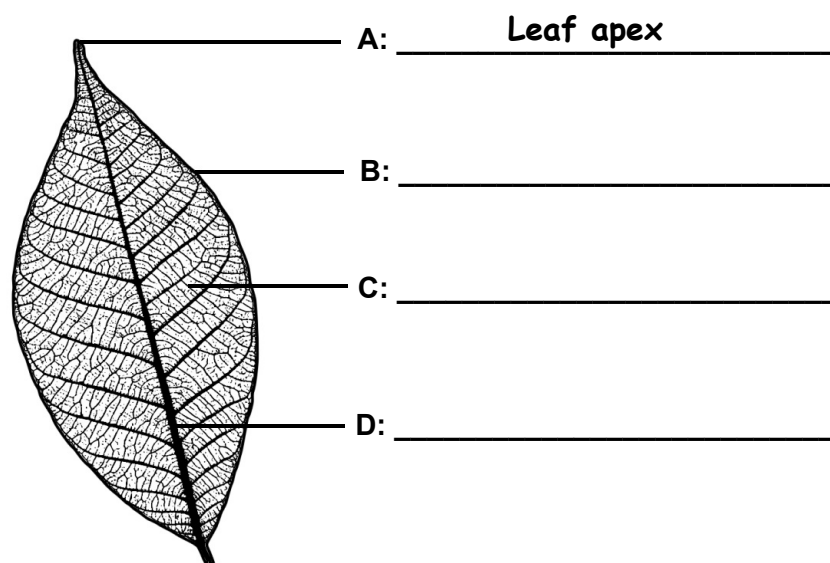


Figure 2.1: Diagram of a leaf skeleton

(a) Label parts **B**, **C** and **D**.

[3]

(b) Leaves are the main site for photosynthesis in plants.

Write down the word equation for photosynthesis.

[1]

(c) Give **two** ways in which leaves are adapted for photosynthesis.

1. _____

2. _____

[2]

(d) Explain how each adaptation you mentioned in part (c) helps the plant carry out photosynthesis.

1. _____

2. _____

[2]

Question 3 (9 marks)

Sexual and asexual reproduction are the two main ways organisms reproduce.

- (a) State the importance of reproduction for living organisms.

[1]

- (b) Give **two** differences between sexual and asexual reproduction.

1.

2.

[2]

- (c) Give one example of an organism that reproduces asexually.

[1]

- (d) Match each organ of the reproductive system in **Column A** to its correct function in **Column B**.

Column A

Organ
Ovary
Uterus
Oviduct
Scrotum
Testis

Column B

Function
Where sperms are produced
Where a foetus grows
Carries sperms to the urethra
Holds the testis
Where fertilisation occurs
Produces eggs

[5]

Question 4 (14 marks)

Figure 4.1 shows sections of different blood vessels: an artery, a vein and a capillary.

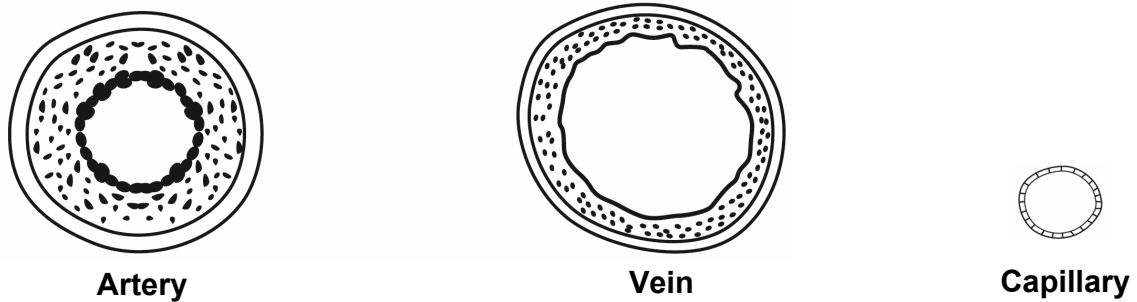


Figure 4.1: Sections of an artery, a vein and a capillary

(a) Observe **Figure 4.1** carefully. Give **two** visible differences between the artery and the vein.

1. _____
2. _____

[2]

(b) Give the function of each blood vessel.

1. Artery: _____
2. Vein : _____
3. Capillary: _____

[3]

(c) For each blood vessel, give one way in which its structure is adapted to its function.

1. Artery: _____

2. Vein: _____

3. Capillary: _____

[3]

- (d) **Table 1** shows the rate of blood supply to different parts of the body (cm^3/min) of an athlete when at rest and during exercise.

Body part	Rate of blood supply when at rest (cm^3/min)	Rate of blood supply during exercise (cm^3/min)
Digestive system	1350	600
Kidney	1000	550
Skin	450	1700
Brain	650	650
Arteries of the heart	150	550
Muscles of the skeleton	750	8000
Bone	650	450

Table 1 : Rate of supply of blood

- (i) Use the information from **Table 1** to complete **Table 2** below. An example is given.

Organ	Rate of blood supply during exercise		
	Reduced	Unchanged	Increased
Digestive system	✓		
Kidney			
Skin			
Brain			
Arteries of the heart			
Muscles of the skeleton			
Bone			

Table 2

[3]

- (ii) Which part of the athlete's body was supplied with most blood during exercise?

[1]

- (iii) Give **two** reasons why this part of the athlete's body received the most blood supply during exercise.

1. _____

2. _____

[2]

Question 5 (9 marks)

A student is exploring the biodiversity of an ecosystem using quadrats to collect information. She lays out five quadrats in an area as shown in **Figure 5.1** below.

The following organisms are found in the ecosystem: slugs, snails and marigold (genda) flowers.

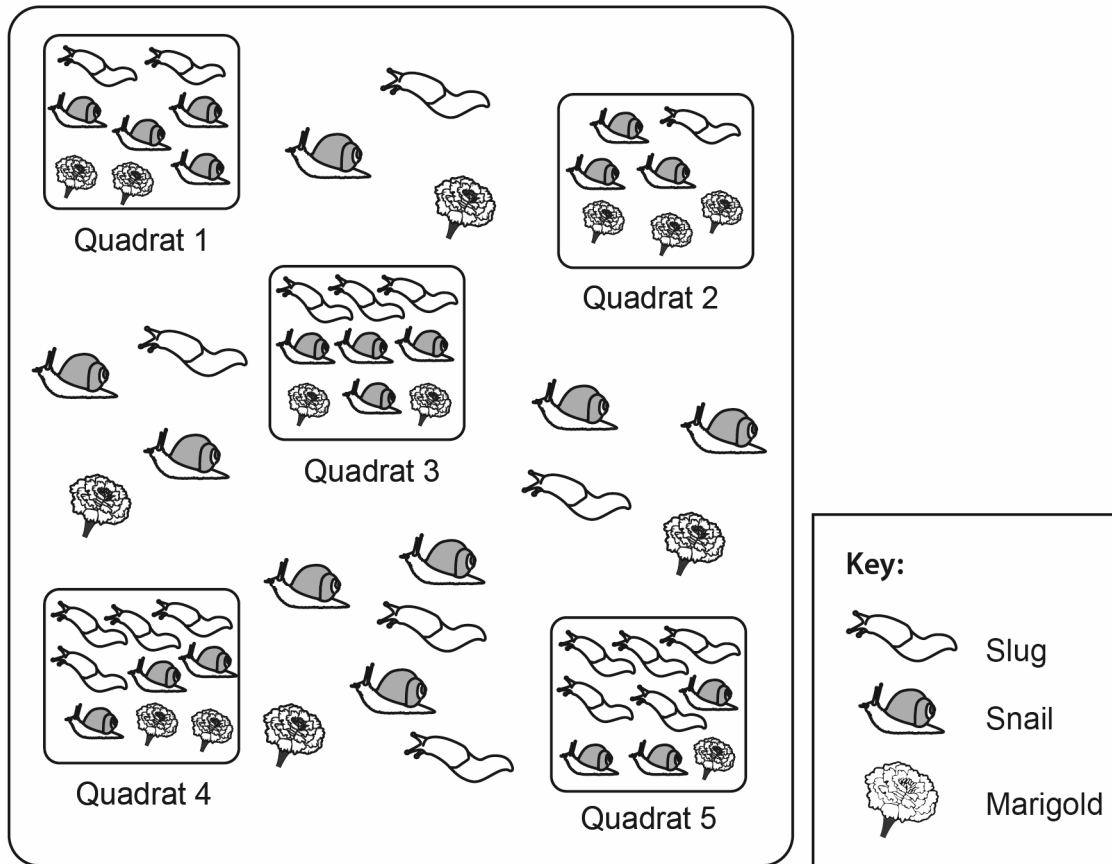


Figure 5.1

(a) Based on the information provided in **Figure 5.1**, complete **Table 3** below by:

(i) giving the missing number of organisms in the quadrats [2]

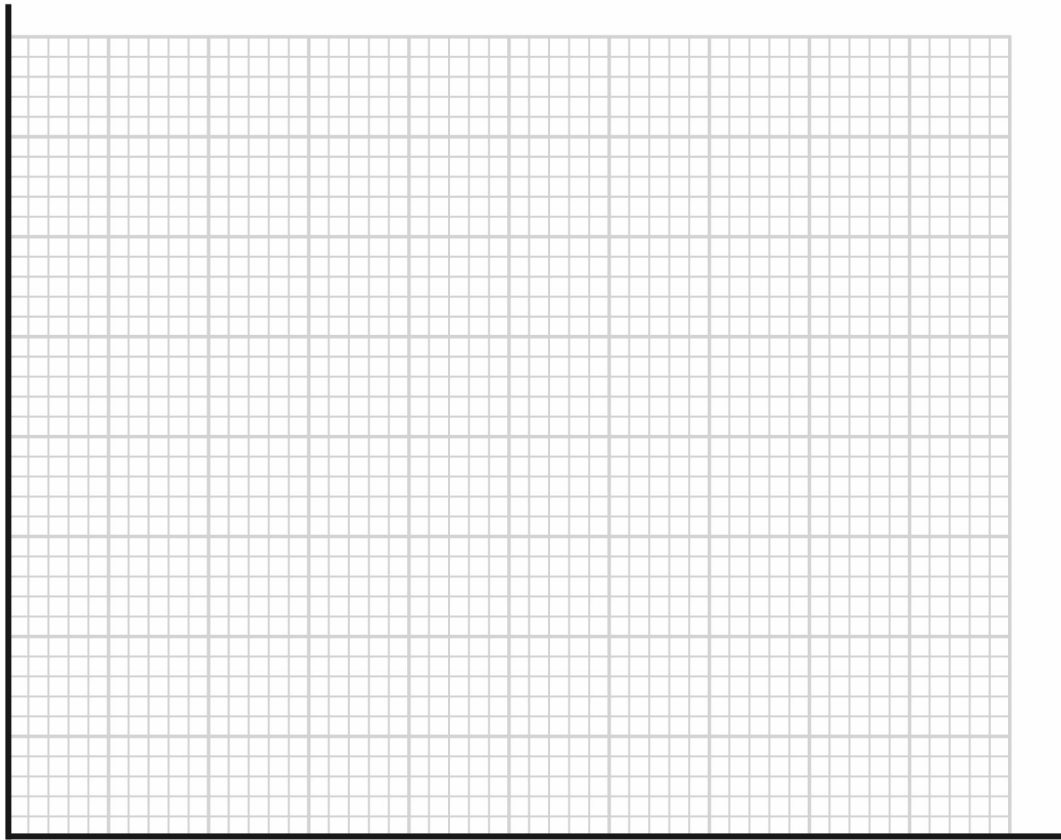
(ii) calculating the mean number of organisms in the quadrats [2]

Type of Organism	Number of organisms in each quadrat					Mean Number of organisms
	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	
Slugs	2	1	3	4	_____	_____
Snails	4	3	4	3	3	3.4
Marigold	2	_____	2	2	1	_____

Table 3

- (b) Using the information from **Table 3**, construct a bar chart of the mean number of each type of organism per quadrat.

[3]



- (c) What can you observe from the bar chart you have drawn in part (b)?

[1]

- (d) The student wants to get a better estimate of the number of organisms in the defined area of the ecosystem. What must she do?

[1]

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