Characteristics and classification of living organisms – 2022 November IGCSE 0610 Biology

1. Nov/2022/Paper_11/No.1

Which process provides an organism with the raw materials needed for tissue repair?

A excretion

B growth

C nutrition

D respiration

2. Nov/2022/Paper_11/No.2

Which name is given to a group of individuals that can reproduce to produce fertile offspring?

A a genus

B a kingdom

C a species

D an organ system

3. Nov/2022/Paper_11/No.3

An animal has four legs, hair and a tail.

To which group of vertebrates does it belong?

A amphibians

B birds

C mammals

D reptiles

4. Nov/2022/Paper_12/No.1

Which process provides an organism with the raw materials needed for tissue repair?

A excretion

B growth

C nutrition

D respiration

5. Nov/2022/Paper_12/No.2

Which name is given to a group of individuals that can reproduce to produce fertile offspring?

A a genus

B a kingdom

C a species

D an organ system

6. Nov/2022/Paper_12/No.3

An animal has four legs, hair and a tail.

To which group of vertebrates does it belong?

A amphibians

B birds

C mammals

D reptiles

7. Nov/2022/Paper_12/No.6

A cell was viewed under a microscope. The actual length of the cell is 0.025 mm. The magnification of the image is ×400.

What is the length of the cell in the image?

A 10 mm **B** 100 mm **C** 1600 mm **D** 16 000 mm

8. Nov/2022/Paper_13/No.1

Which process provides an organism with the raw materials needed for tissue repair?

A excretion

B growth

C nutrition

D respiration

9. Nov/2022/Paper_13/No.2

Which name is given to a group of individuals that can reproduce to produce fertile offspring?

A a genus

B a kingdom

C a species

D an organ system

10. Nov/2022/Paper_13/No.3

An animal has four legs, hair and a tail.

To which group of vertebrates does it belong?

A amphibians

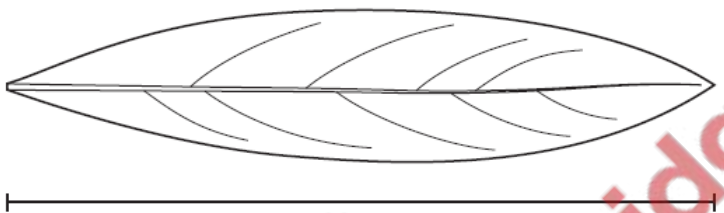
B birds

C mammals

D reptiles

11. Nov/2022/Paper_13/No.6

The diagram shows a leaf which has been drawn at a magnification of ×7.



What was the actual length of the leaf?

A 11 mm **B** 14 mm **C** 19 mm **D** 98 mm

12. Nov/2022/Paper_21/No.1

Which process provides an organism with the raw materials needed for tissue repair?

A excretion

B growth

C nutrition

D respiration

13. Nov/2022/Paper_21/No.2

Which name is given to a group of individuals that can reproduce to produce fertile offspring?

A a genus

B a kingdom

C a species

D an organ system

14. Nov/2022/Paper_21/No.3

Root hair cells are found on plant roots.

Which feature is present in a root hair cell but **not** in a sperm cell?

A cell membrane

B cell wall

C chloroplasts

D cytoplasm

15. Nov/2022/Paper_21/No.19

Campylobacter is a bacterium that can cause food poisoning.

Which word describes *Campylobacter*?

A antibody

B disease

C pathogen

D symptom

16. Nov/2022/Paper_22/No.1

Which process provides an organism with the raw materials needed for tissue repair?

A excretion

B growth

C nutrition

D respiration

17. Nov/2022/Paper_22/No.2

Which name is given to a group of individuals that can reproduce to produce fertile offspring?

A a genus

B a kingdom

C a species

D an organ system

18. Nov/2022/Paper_22/No.3

Root hair cells are found on plant roots.

Which feature is present in a root hair cell but **not** in a sperm cell?

A cell membrane

B cell wall

C chloroplasts

D cytoplasm

19. Nov/2022/Paper_22/No.4

The cells listed have specialised structures that allow them to carry out their functions.

1 ciliated cell

2 nerve cell

3 root cortex cell

4 sperm cell

Which cells have structures that can move?

A 1 and 2 **B** 1 and 4 **C** 2 and 3 **D** 3 and 4

20. Nov/2022/Paper_23/No.1

Which process provides an organism with the raw materials needed for tissue repair?

A excretion

B growth

C nutrition

D respiration

21. Nov/2022/Paper_23/No.2

Which name is given to a group of individuals that can reproduce to produce fertile offspring?

A a genus

B a kingdom

C a species

D an organ system

22. Nov/2022/Paper_23/No.3

Root hair cells are found on plant roots.

Which feature is present in a root hair cell but **not** in a sperm cell?

A cell membrane

B cell wall

C chloroplasts

D cytoplasm

23. Nov/2022/Paper_31/No.1(a)

(a) (i) Keys can be used to identify a species.

State the name of the type of key that uses paired choices of features.

..... [1]

(ii) Fig. 1.1 shows drawings of six different birds and their names.

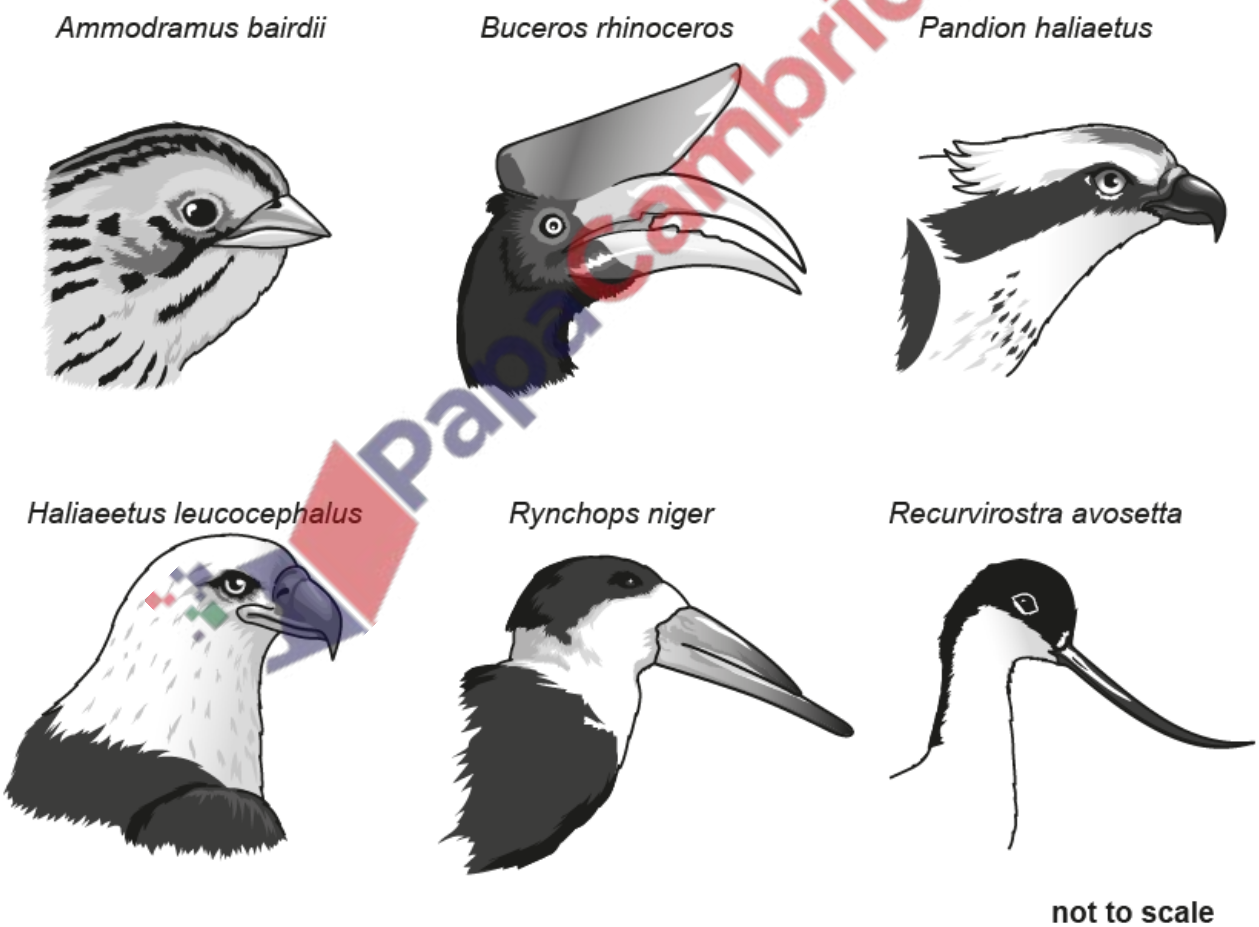


Fig. 1.1

Use the key to identify the birds in Fig. 1.1.

Complete Table 1.1 by writing the letters of the birds **A** to **F** in the correct box.

		key	letter of the bird
1	(a)	beak is longer than the head	go to 2
	(b)	beak is shorter than the head	go to 3
2	(a)	beak curves upwards	**C**
	(b)	beak does **not** curve upwards	go to 4
3	(a)	top part of the beak is hooked over the bottom part of the beak	go to 5
	(b)	top part of the beak is **not** hooked over the bottom part of the beak	**E**
4	(a)	top part of the beak is shorter than bottom part of the beak	**A**
	(b)	has a large projection above the beak	**B**
5	(a)	head has a stripe	**F**
	(b)	head does **not** have a stripe	**D**

Table 1.1

name of the bird in Fig. 1.1	letter of the bird in the key
Ammodramus bairdii	
Buceros rhinoceros	
Pandion haliaetus	
Haliaeetus leucocephalus	
Rynchops niger	
Recurvirostra avosetta	

[5]

(iii) State **two** features of birds, other than the beak, that can be used to classify them as birds.

1 .....

2 .....

[2]

(a) Fig. 1.1 is a branching key that can be used to identify different types of crustaceans.

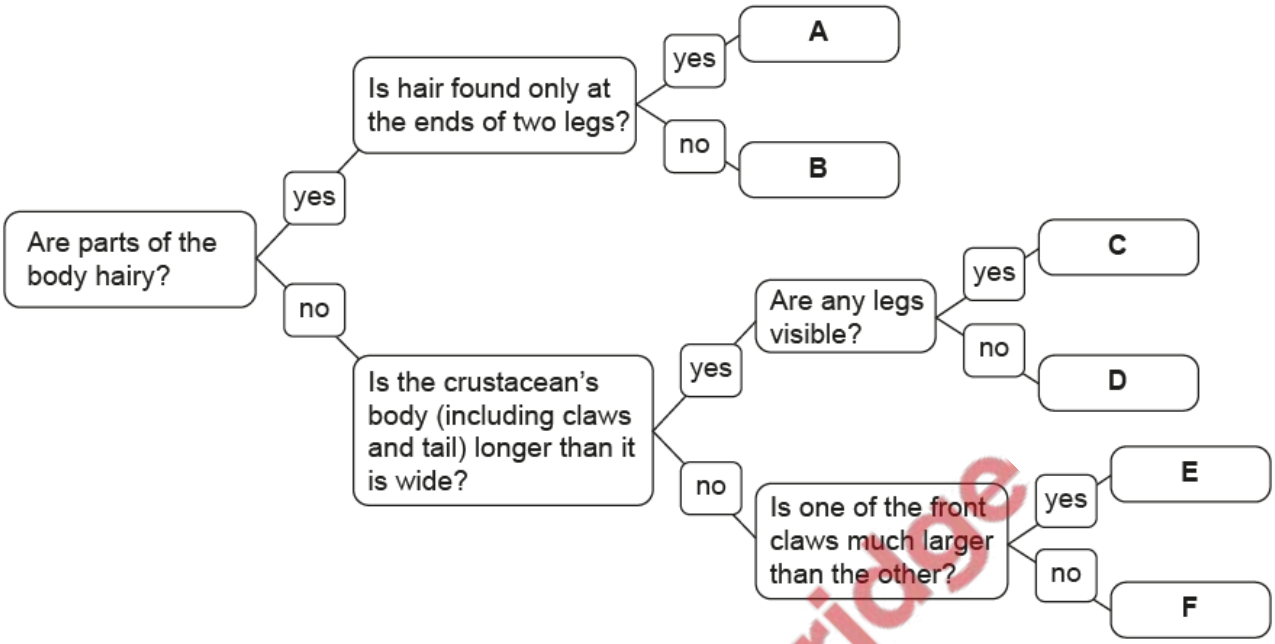
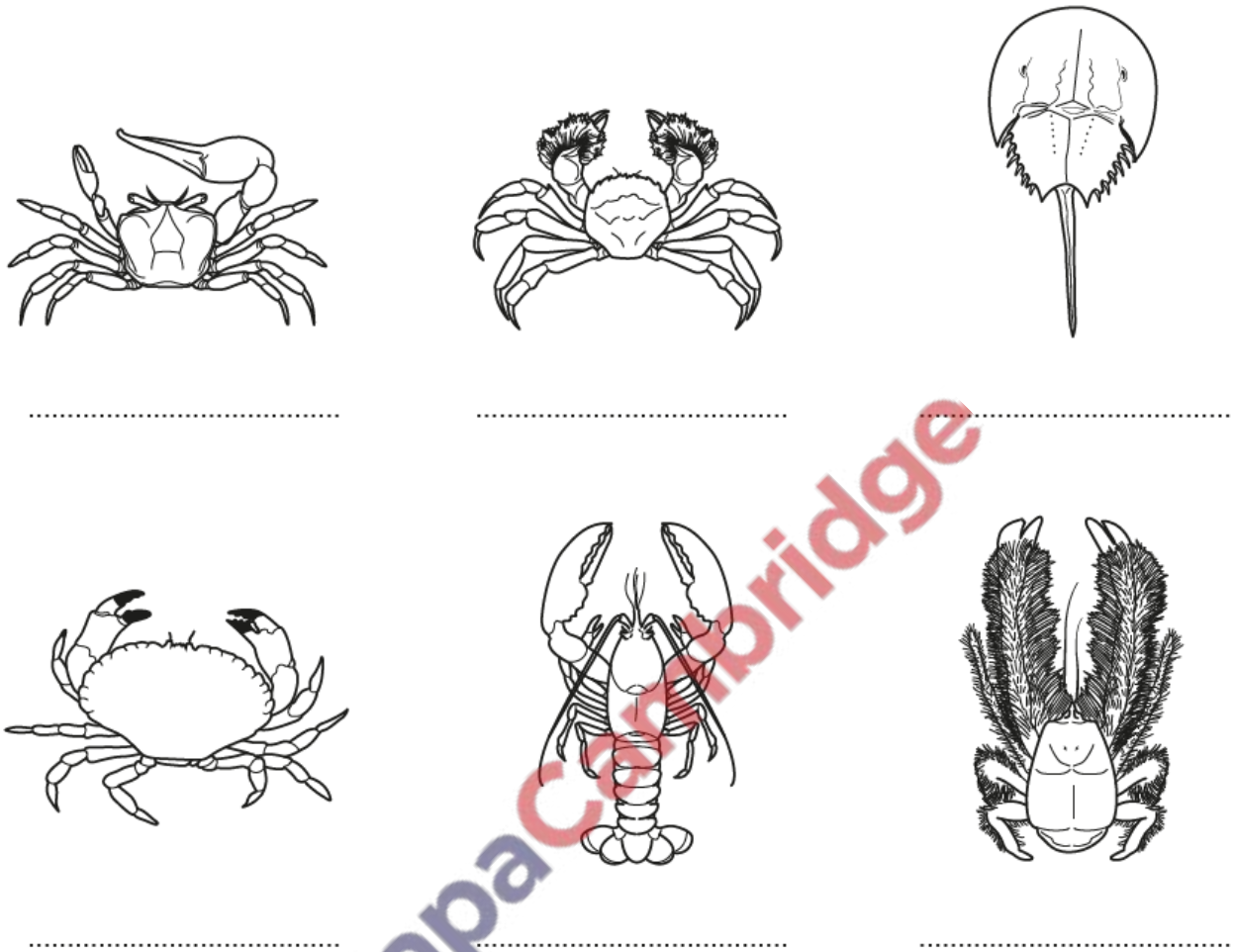


Fig. 1.1

Fig. 1.2 shows six crustaceans.

Use the key in Fig. 1.1 to identify the six different types of crustacean.

Write the letters on the lines in Fig. 1.2.



....

....

Fig. 1.2 [5]

(b) Crustaceans are one group of arthropods.

State the names of **two other** groups of arthropods.

1 .....

2 .....

[2]

(c) Describe **one** way in which all vertebrates differ from arthropods.

.....

.....

..... [1]

[Total: 8]

25. Nov/2022/Paper_33/No.1

Fig. 1.1 shows leaves from five different species of tree.

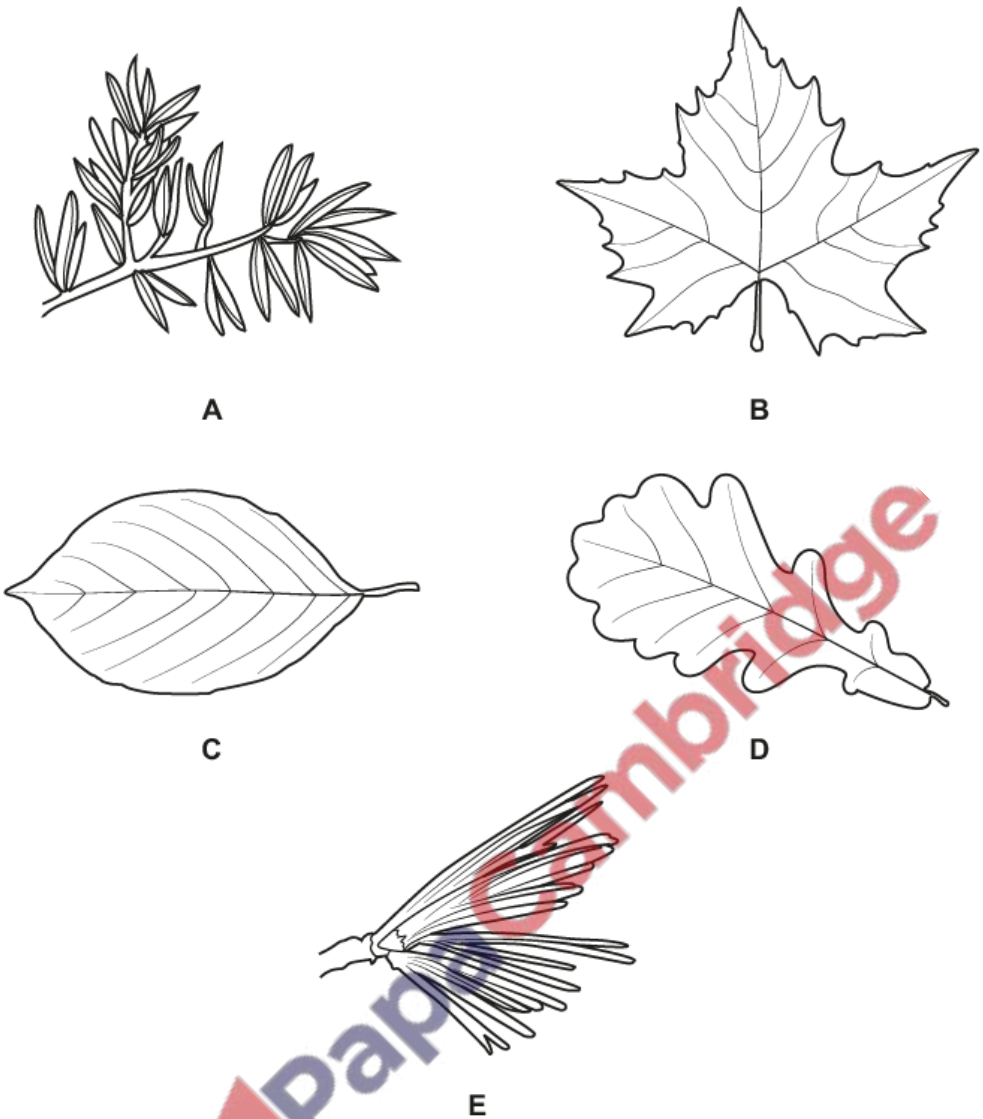


Fig. 1.1

(a) (i) Use the key to identify each tree species in Fig. 1.1.

Write the letter of each tree species (**A**, **B**, **C**, **D**, **E**) in the correct box beside the key.

1 (a)	multiple narrow, needle-like leaves	go to 2	
(b)	single leaf which is **not** needle-like	go to 3	
2 (a)	leaves are evenly spread along the branch	*Juniperus communis*	
(b)	leaves start from a single point	*Cedrus deodara*	
3 (a)	leaf has an unlobed smooth edge	*Frangula alnus*	
(b)	leaf has a lobed edge	go to 4	
4 (a)	lobes have a smooth, rounded edge	*Quercus robur*	
(b)	lobes have a jagged, irregular edge	*Acer pseudoplatanus*	

[4]

(ii) State the genus of *Quercus robur*.

..... [1]

(b) (i) Define the term species.

.....

.....

..... [2]

(ii) Organisms are classified into kingdoms based on their features.

State **two** features of plant cells that are **not** found in animal cells.

1 .....

2 .....

[2]

[Total: 9]

(b) Mammals can be classified according to the position and shape of their teeth.

Fig. 1.2 shows the skulls of seven mammals.

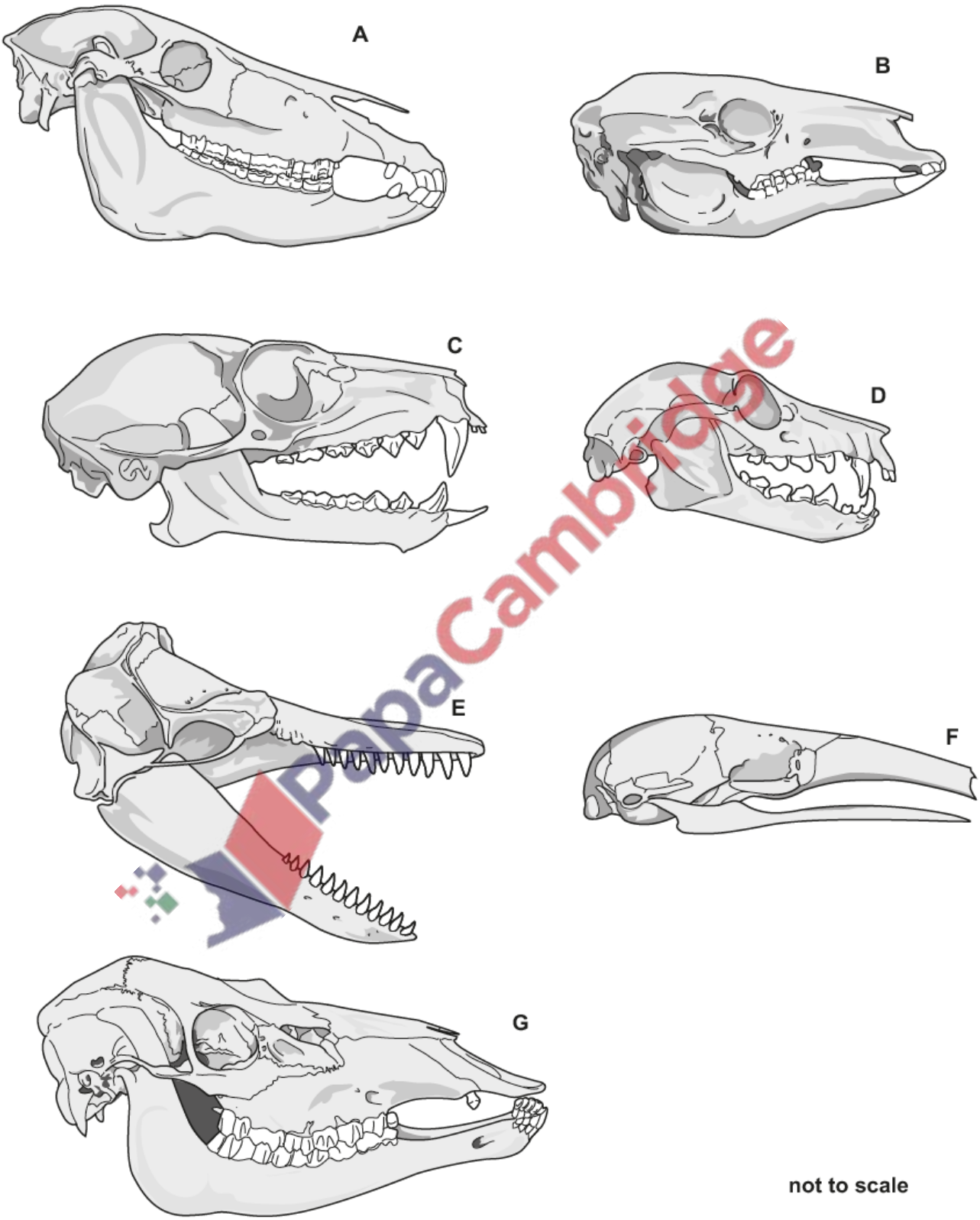


Fig. 1.2

(i) Use the key to identify each species shown in Fig. 1.2.

Write the letter of each species (**A** to **G**) in the correct box in the key.

Key

1 (a)	two or more different types of teeth	go to 2	
(b)	fewer than two different types of teeth	go to 3	
2 (a)	have wide gap between front and back teeth in both jaws	go to 4	
(b)	have no wide gap between front and back teeth in both jaws	go to 6	
3 (a)	all teeth of similar shape	*Orcinus orca*	
(b)	no teeth on either jaw	*Myrmecophaga tridactyla*	
4 (a)	no incisors in upper jaw	*Cervus elephus*	
(b)	incisors in both upper and lower jaw	go to 5	
5 (a)	incisors on lower jaw longer than incisors on upper jaw	*Macropus rufus*	
(b)	incisors on upper and lower jaw are similar in size	*Equus ferus*	
6 (a)	incisors on lower jaw project forwards	*Lemur catta*	
(b)	incisors on lower jaw do not project forwards	*Pteropus niger*	

[4]

(ii) Killer whales, *Orcinus orca*, are mammals.

State **two internal** features you would expect to find in a killer whale that you would **not** find in a fish.

1 .....

2 .....

[2]

(iii) State the name of the group of animals that includes mammals and fish.

..... [1]

Phytoplankton consist of many species of single-celled and many-celled algae.

(a) Algae are classified in the Protoctist kingdom. All algae contain one or more chloroplasts.

State the name of another kingdom that contains organisms which have chloroplasts.

..... [1]

A student investigated the species composition of the phytoplankton in a lake.

Fig. 1.1 shows some of the phytoplankton collected by the student.

Fig. 1.1

(b) The actual length of alga **X** is 0.19 mm.

Convert the actual length of alga **X** to micrometres.

..... μm [1]

(c) The student made careful drawings of seven types of alga found in the samples of lake wate

The drawings are shown in Fig. 1.2.

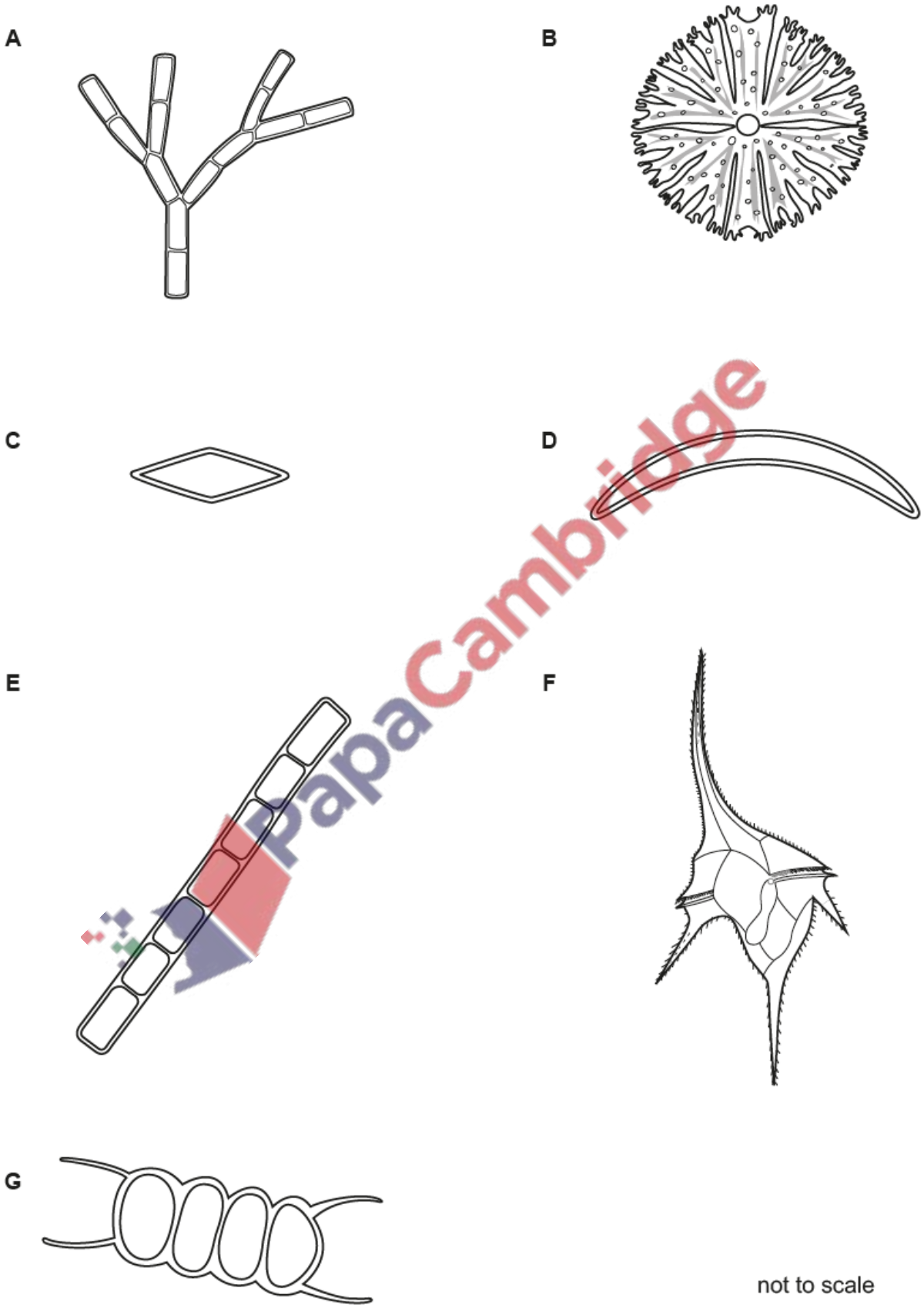


Fig. 1.2

Use the key to identify each of the species **A** to **G**. Write the letter of each species in the correct box beside the key.

1	alga has four spine-like extensions	go to 2	
	alga does not have four spine-like extensions	go to 3	
2	alga has spine-like extensions that are all the same length	*Scenedesmus communis*	
	alga has spine-like extensions that are different lengths	*Ceratium hirundinella*	
3	alga has a round shape	*Micrasterias radiosa*	
	alga does not have a round shape	go to 4	
4	alga narrows towards the ends	go to 5	
	alga does not narrow towards the ends	go to 6	
5	algal cell is semi-circular in shape	*Closterium dianae*	
	algal cell is not semi-circular in shape	*Navicula radiosa*	
6	alga is branched	*Chaetophora incrassata*	
	alga is not branched	*Zygnema* sp.	

[5]

(d) Phytoplankton are photosynthetic organisms.

Describe the importance of phytoplankton in the food web of lake ecosystems.

.....

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 10]

28. Nov/2022/Paper_42/No.1

Phytoplankton consist of many species of single-celled and many-celled algae.

(a) Algae are classified in the Protoctist kingdom. All algae contain one or more chloroplasts.

State the name of another kingdom that contains organisms which have chloroplasts.

..... [1]

A student investigated the species composition of the phytoplankton in a lake.

Fig. 1.1 shows some of the phytoplankton collected by the student.

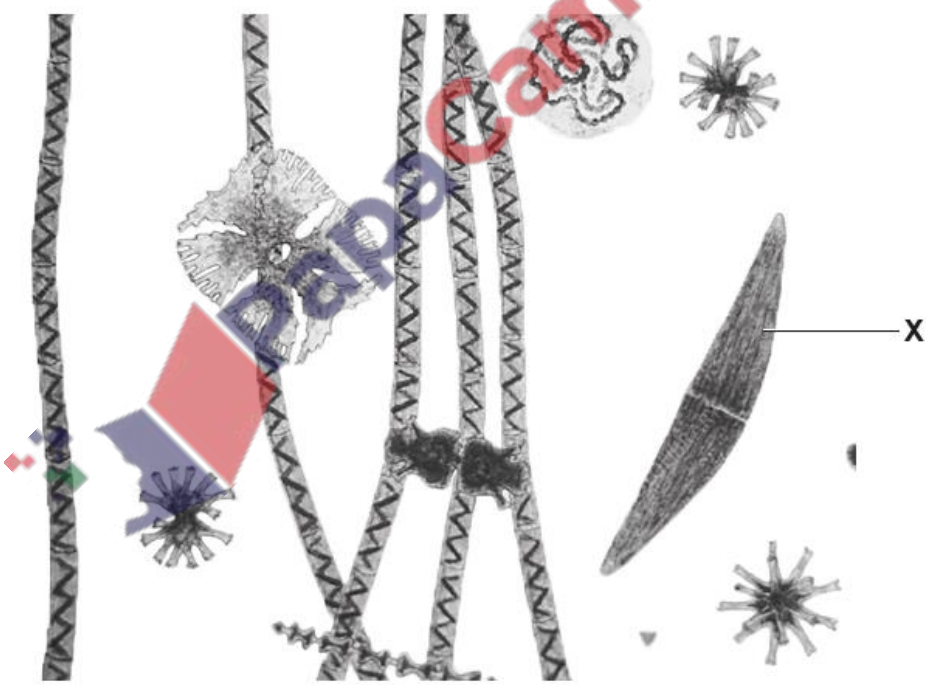


Fig. 1.1

(b) The actual length of alga **X** is 0.19 mm.

Convert the actual length of alga **X** to micrometres.

..... μm [1]

29. Nov/2022/Paper_42/No.3(a_ b)

Aphids are insects that feed on phloem sap by inserting their mouthparts into phloem tissue.

Fig. 3.1 shows an aphid feeding on phloem tissue in a leaf.

Fig. 3.1

(a) (i) State **two** features **visible in Fig. 3.1** that identify this animal as an insect.

1 .....

2 .....

[2]

(ii) Aphids can transmit viral pathogens when they feed on a plant.

Suggest how a severe infestation of aphids on crop plants can be avoided.

.....

.....

.....

.....

..... [2]

(iii) The aphid shown in Fig. 3.1 is feeding on phloem tissue in a leaf.

State the names of **two** tissues in the leaf that the mouthparts of the aphid pass through to reach the phloem.

1 .....

2 .....

[2]

(b) Aphids have been used to investigate the translocation of sucrose in phloem tissue. While they are feeding on phloem sap aphids excrete a sucrose-rich fluid known as honeydew.

In an investigation, two groups of four aphids were placed at intervals along the stem of a young willow plant, as shown in Fig. 3.2.

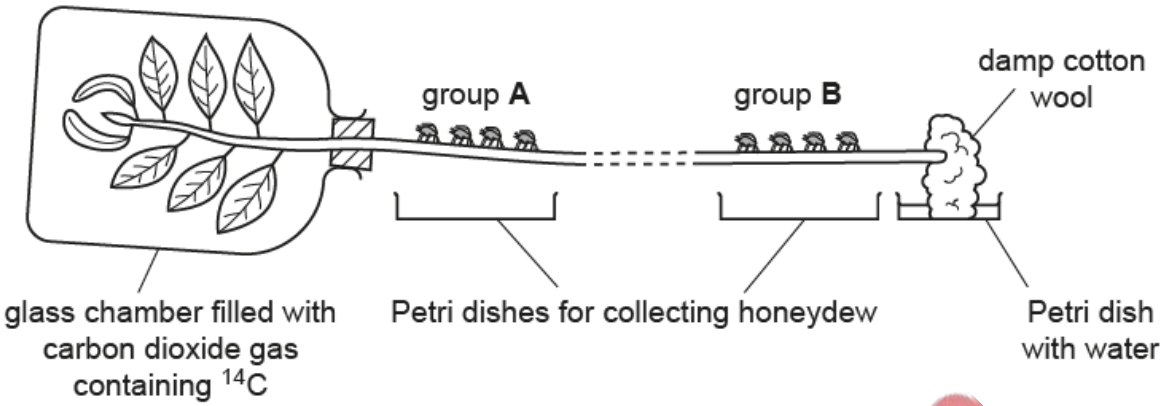


Fig. 3.2

The leaves were enclosed in an airtight glass chamber. A special form of carbon dioxide gas that contained radioactive carbon-14 (^{14}C) was supplied to the leaves for a short period of time.

Samples of honeydew were collected at intervals from the groups of aphids. The time taken for sucrose containing ^{14}C to travel the distance between group **A** and group **B** was recorded.

The investigation was repeated twice using a fresh stem and different groups of aphids for each trial. The results are shown in Table 3.1.

(i) Complete Table 3.1 by calculating the rate of movement of ^{14}C in trial 3.

Table 3.1

trial	distance between group **A** and group **B** on the stem / mm	time taken for ^{14}C to travel between group **A** and group **B** / minutes	rate of movement of ^{14}C / mm per hour
1	650	120	325
2	340	75	272
3	630	150	

[1]

(ii) Outline how ^{14}C in carbon dioxide gas becomes incorporated into the sucrose molecules that are translocated in the phloem.

.....

.....

.....

.....

.....

.....

..... [3]