

1. Characteristics and classification of living organisms

1.3 Features of organisms

Paper 3 and 4

Question Paper

Paper 3

Questions are applicable for both core and extended candidates

1 (b) Fig. 1.1 is a photograph of *Lithobius forficatus*, a species of myriapod.



Fig. 1.1

- (i) State the genus of the organism shown in Fig. 1.1.
 [1]
- (ii) State **one** feature **visible** in Fig. 1.1 that identifies the organism as:
 a myriapod
 an arthropod. [2]
- (iii) State the names of **two** groups of arthropods, other than myriapods.
 1
 2 [2]
- (iv) State **two** features of plant cells that would be **absent** in the cells of the organism shown in Fig. 1.1.
 1
 2 [2]

- (c) Adaptive features enable organisms to survive in their environment.

Fig. 1.2 is a photograph of another species of arthropod. Some of its adaptive features are visible in Fig. 1.2.



Fig. 1.2

- (i) State **one** adaptive feature visible in Fig. 1.2 that reduces water loss when the organism is on land.

..... [1]

- (ii) State the name of the kingdom that the organism in Fig. 1.2 belongs to.

..... [1]

2 (a) All living organisms can be classified into groups by the features they share.

(i) Complete the sentences about classifying organisms.

A species is a group of organisms that reproduce to produce

..... offspring.

All species are named using an internationally agreed system called the

..... system.

Fish, mammals, reptiles and amphibians are vertebrate groups. The other

vertebrate group is All vertebrates belong to the

..... kingdom.

One feature that is used to identify vertebrates is a

[5]

(ii) Draw a **circle** around the characteristic shared by all living organisms.

egestion

nutrition

sexual reproduction

transpiration

[1]

- 3 Fig. 1.1 shows a photograph of a pseudoscorpion.

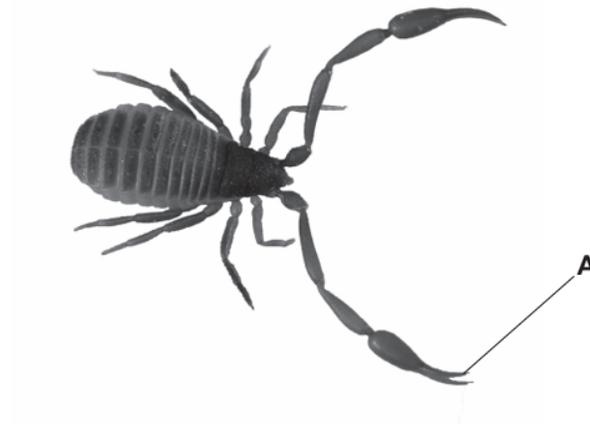


Fig. 1.1

- (a) (i) State **two** features, **visible** in Fig. 1.1, that can be used to classify this organism as an arachnid.

1

2

[2]

- (ii) State the kingdom that arachnids belong to.

..... [1]

4 (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]

- 5 (a) Fig. 2.1 is a photograph of a lobster, which is an arthropod.



Fig. 2.1

Describe **two** pieces of evidence visible in Fig. 2.1 that identify this organism as an arthropod.

1

2 [2]

- (b) The scientific name of the arthropod in Fig. 2.1 is *Homarus americanus*.

State the genus name.

..... [1]

- (c) The arthropod shown in Fig. 2.1 is a crustacean.

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

1

2 [2]

- 6 Fig. 1.1 shows animals that belong to one vertebrate group.

State the name of this vertebrate group and give **one visible** characteristic feature of this group.



Fig. 1.1

name of group

feature of group [2]

- (c) State the names of **two other** groups of vertebrates.

1

2 [2]

- 7 (a) Table 2.1 shows the names of three groups of arthropods and some of their characteristics.

Place ticks (✓) in the boxes to show the characteristics present in each group.

Table 2.1

characteristic	arthropod group		
	arachnids	crustaceans	myriapods
four pairs of legs			
one pair of antennae			
body divided into two main parts			

[3]

8 Fig. 6.1 is a photograph of a lion.



Fig. 6.1

(a) Lions are mammals and have the scientific name *Panthera leo*.

(i) State **one** feature **visible** in Fig. 6.1 that identifies the lion as a mammal.

.....[1]

(ii) State the genus of this mammal.

.....[1]

(b) Mammals are one of the five groups of vertebrates.

The list describes some of the features of fish, amphibians, reptiles, mammals and birds. Some features belong to more than one group.

State the name of **one** vertebrate group which has the distinguishing feature of:

scales

feathers

gills

smooth moist skin

[4]

(c) State **two** features of the cells of all living organisms.

1

2

[2]

[Total: 8]

Paper 4

Questions are applicable for both core and extended candidates unless indicated in the question

9 Fig. 5.1 is a photograph of a koala.

Koalas are marsupial mammals that give birth to offspring that are incompletely developed.

The offspring develops further for several months inside the pouch of the mother.



Fig. 5.1

(a) State **one** feature visible in Fig. 5.1 that could be used to identify the koala as a mammal.

..... [1]

10 Phytoplankton consist of many species of single-celled and many-celled algae. **(extended only)**

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

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

..... [1]

11 (a) Some students were studying the activity of yeast. They made a fact file, as shown in Fig. 1.1.

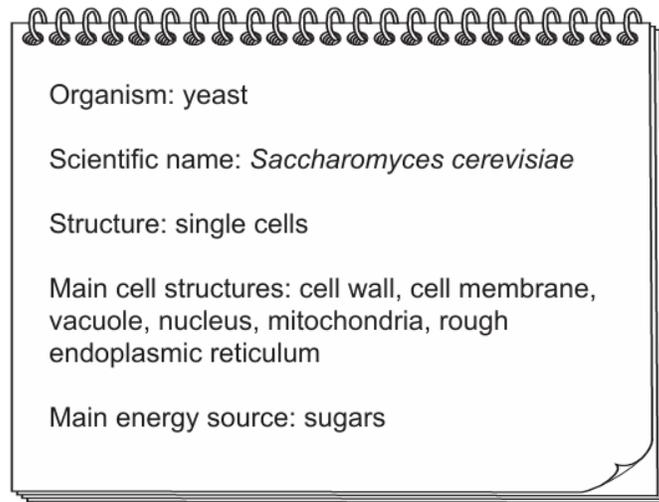


Fig. 1.1

(i) State the kingdom in which yeast is classified. **(extended only)**

..... [1]

12 Fig. 4.1 is a diagram of a virus.

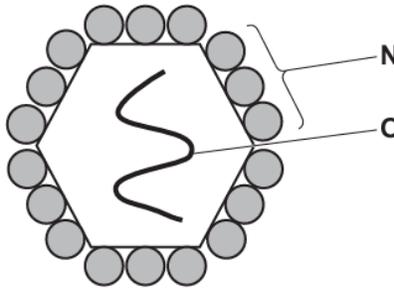


Fig. 4.1

(a) Identify the parts of the virus labelled **N** and **O**. (extended only)

N

O

[2]

13 (a) Baker's yeast, *Saccharomyces cerevisiae*, is a single-celled organism that is classified in the kingdom Fungi.

Fig. 1.1 is a drawing of a section through a yeast cell. (extended only)

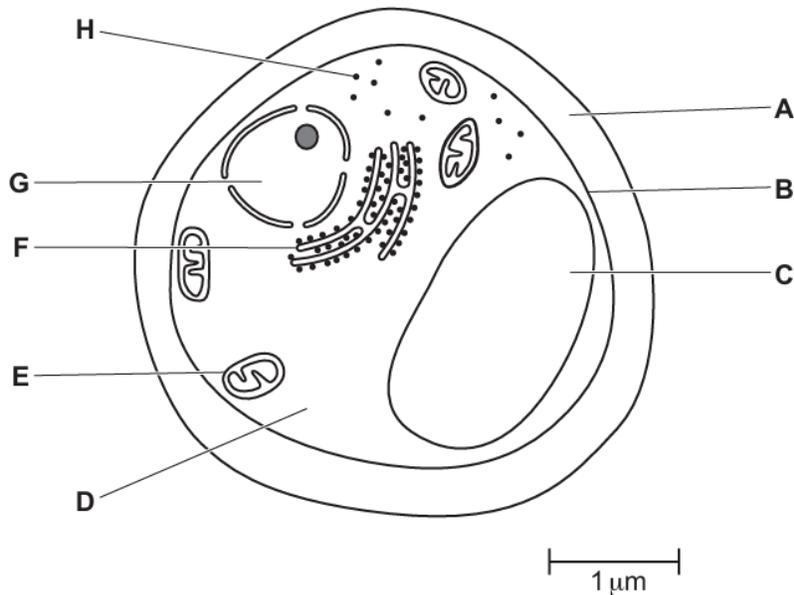


Fig. 1.1

(i) State **one other** kingdom that contains organisms that all have structure **A**. (extended only)

..... [1]

14 (e) Most insects and some crustaceans have compound eyes.

State the name of the group that contains insects and crustaceans.

..... [1]

15 (a) Fish, mammals and birds are all groups of vertebrates.

(i) State the names of the **two other** main groups of vertebrates.

..... and [1]

(ii) Complete Table 1.1 to compare the features of fish, mammals and birds.

Table 1.1

feature	fish	mammals	birds
organ involved in gas exchange	gills		lungs
circulatory system			double
body covering		fur	
presence of external ears (pinnae)	no		

[3]

16 Ciliates are classified in the kingdom Protocist. Bacteria are classified in the kingdom Prokaryote.

(a) State **two structural** features that distinguish the cells of a protocist from a prokaryote. **(extended only)**

1

.....

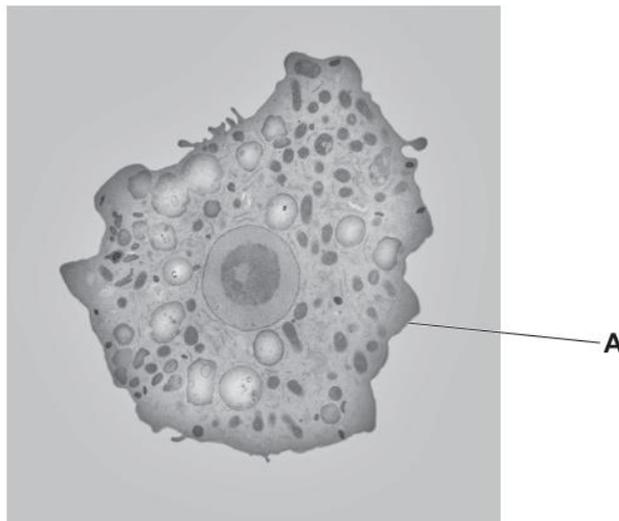
2

.....

[2]

17 All living organisms excrete waste products. **(extended only)**

(a) Fig. 3.1 is a photomicrograph of *Naegleria fowleri*, a single-celled protocist that lives in watery environments.



magnification $\times 4000$

Fig. 3.1

(i) State a feature of *N. fowleri*, visible in Fig. 3.1, that distinguishes it from prokaryotes.

..... [1]

18 All commercial breeds of sheep belong to the species *Ovis aries*.

The Merino is a breed of sheep that is farmed mainly for its wool. The wool is very thick and is made of lots of very thin hairs.

Fig. 1.1 shows a female Merino sheep with her newborn lamb.



Fig. 1.1

(b) The presence of hair is a feature that is only found in mammals.

State **two other** features that distinguish mammals from all other vertebrates.

1

2

[2]

- 19 All living organisms are placed into groups according to their features.
Myriapods are one of the main groups of arthropods.

(a) State **two** features of myriapods that can be used to distinguish them from other arthropods.

1

2

[2]

Fig. 1.1 shows that there are four main groups of arthropods.

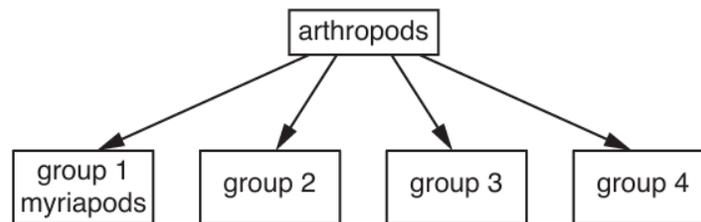


Fig. 1.1

(b) State the names of **two** of the other groups of arthropods in Fig. 1.1.

1

2

[2]

20 (a) Fig. 1.1 shows four arthropods.

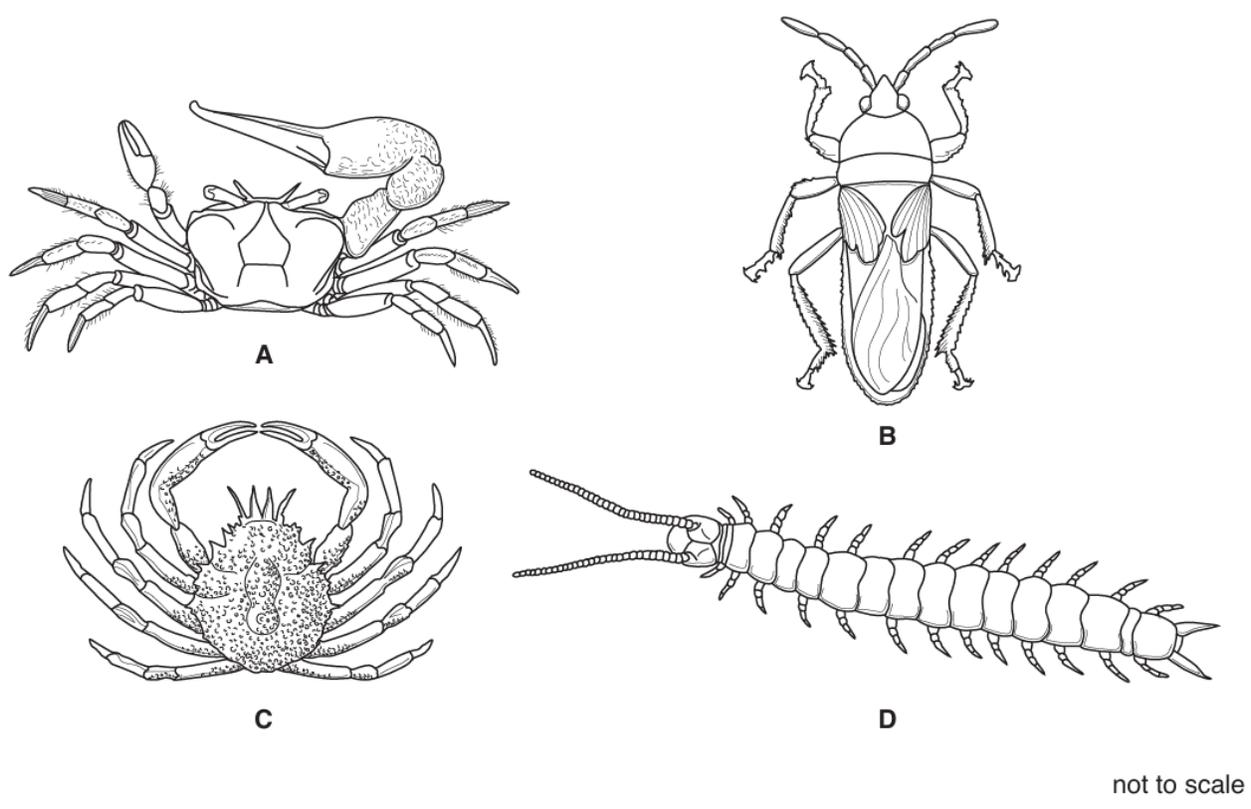


Fig. 1.1

(i) State **two** features, visible in Fig. 1.1, that are common to all arthropods.

- 1
- 2

[2]

- (b) The Hawaiian happy-face spider, *Theridion grallator*, is found on several of the Hawaiian islands. Some of the spiders have a very distinctive pattern on their bodies as shown in Fig. 1.3.



Fig. 1.3

- (i) State **one** feature, visible in Fig. 1.3, that identifies *T. grallator* as an arachnid.

..... [1]

21 Fig. 5.1 shows an adult fly, *Chrysomya megacephala*.



Fig. 5.1

(a) State **three** visible features from Fig. 5.1 that could be used to distinguish adult insects from other arthropods.

1

2

3

[3]