

**Cambridge Assessment
International Education**

C Level |) \$- \$

BIOLOGY

TOPICAL P&

With Marks Scheme

All Variants

Question Bank from 2016 to 2023

Classified in 19 Chapter and 39 Sub-topics

Questions Order New to Old

References of repeated Questions added

IRAM HABIB MALIK

**LGS | City School | LACAS | SICAS | Roots
Froebel's International**

 **STUDENTS RESOURCE**

Airport Road :
Shop 23-24,
Basement Faysal Bank,
Near Yasir Broast,
Airport Road, Lahore.
Mob: 0321-4567519
Tel: 042-35700707

DHA Ph-V:
Plaza No. 52-CCA, Ph-5
DHA Lahore Cantt.
Mob: 0321-4924519
Tel: 042-37180077

Johar Town :
Opp. Beaconhouse JTC
Adjacent Jamia Masjid PIA
Society Shadewal Chowk,
Johar Town Lahore.
Mob: 0313-4567519
Tel: 042-35227007

Bahria Town:
70 - Umer Block
Main Boulevard
Commercial Area
Bahria Town Lahore.
Mob: 0315-4567519
Tel: 042-35342995

Book Title: U Level Biology Paper I with Theory

Edition: 2021 Edition

Prepared by: Mās Iram Habib Malik

Syllabus: O Level

Published by:  **STUDENTS RESOURCE** Airport Road 0423-5700707

Price: PKR 100/-

COPYRIGHT

©STUDENTS RESOURCE® 2021

The rights of Students Resource being Publisher of this book has been asserted by him in accordance with the Copy Right Ordinance 1962 of Pakistan.

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the Students Resource or under licence from the Registrar Copyright from Intellectual Property Organization Pakistan.

The syllabus contents and questions from past papers used herein are the property of Cambridge Assessment International Education (CAIE). The use of syllabus and questions from past papers used in this book does not vest in the author or publisher any copyright ownership, nor does the use of CAIE material imply any affiliation with CAIE.

Any individual or institution violating the copyrights will be prosecuted in the court of law under the lex-forei of Pakistan at his/their expense.

No further notes and legal warning would be issued for any kind of legal activity.

Legal Advisor



7 CBH9BH'
C' @J9 @6 -C @C; MHCD=7 5 @D&

Hcd]Wp%%	Cell Structure & Function_____	5
Hcd]Wp%&	Specialised Cells, Tissues & Organs_____	7
Hcd]W&'%	Concept and Use of a Classification System _____	8
Hcd]W&"&	Features of Organisms_____	12
Hcd]W' '%	Diffusion & Osmosis_____	27
Hcd]W' "&	Active Transport _____	30
Hcd]W('%	Biological Molecules _____	32
Hcd]W) '%	Enzyme Action _____	33
Hcd]W) "&	Effects of Temperature & PH_____	37
Hcd]W* '%	Photosynthesis _____	40
Hcd]W* "&	Leaf Structure_____	47
Hcd]W* "	Mineral Nutrition_____	51
Hcd]W+ '%	Uptake & Transport of Water & Ions_____	55
Hcd]W+ "&	Transpiration & Translocation_____	61
Hcd]W, '%	Diet _____	72
Hcd]W, "&	Human Digestive System_____	80
Hcd]W, "	Absorption & Assimilation_____	96
Hcd]W- '%	Human Gas Exchange _____	102
Hcd]W/\$' %	Respiration _____	119
Hcd]W/\$"	Anaerobic Respiration _____	121
Hcd]W/%%' %	Circulatory System_____	127
Hcd]W/%%&	Heart_____	129
Hcd]W/%%"	Blood Vessels_____	139
Hcd]W/%%(Blood_____	145
Hcd]W/%&' %	Disease _____	148
Hcd]W/%&"&	Antibiotics_____	157
Hcd]W/%&"	Immunity _____	158
Hcd]W% ' %	Excretion_____	164
Hcd]W% "&	Urinary System_____	167
Hcd]W% '('%	Mammalian Nervous System_____	170
Hcd]W% '("&	Mammalian Sense Organs_____	179
Hcd]W% '("	Mammalian Hormones_____	186
Hcd]W% '(('	Homeostasis_____	191
Hcd]W% '(')	Temperature Control'_____	S'192'
Hcd]W%) '%	Coordination & Response in Plants_____	197

Hcd]W% %Á Þ &^æ/Öæã } Á	' ÁGEGÁ
Hcd]W% "Á Ö^ç æBÁ^ç æÁ^ [ä &ç } Á	' ÁGHIÁ
Hcd]W% " Á ù^ç æÁ^ [ä &ç } Á	' ÁGĪ Á
Hcd]W% "(Á ù^ç æÁ^ [ä &ç } Á	' ÁGHI Á
Hcd]W%+ %Á Xæã } Á	' ÁG Í Á
Hcd]W%+ "Á ÖPÖÁ	' ÁG Ī Á
Hcd]W%+ " Á Q @!æ &^ Á	' ÁG FÁ
Hcd]W%+ "(Á ù^ç &ç } Á	' ÁG Ī Á
Hcd]W% %Á Óæ ç&@ [[*^ Á	' ÁG Ī Á
Hcd]W% "Á Ö^ç æÁ [äã } Á	' ÁG Ī Á
Hcd]W% %Á Ò^ç æÁ [, Á	' ÁG Ī Á
Hcd]W% "Á Þ çã } Ö^ç &^ Á	' ÁGĪ Á
Hcd]W% " Á Ò&^ç { •Á Óæ äç^ • æ Á	' ÁGĪ Á
Hcd]W% "(Á Ò^ç æÁ { æ • Á } Á	' ÁGĪ Á
Hcd]W% ") Á Ô [] •^çæ } Á	' ÁGFJÁ
AUf_ 'GW Ya Y	' &%Á

Topic 1.1: Cell Structure & Function

2017

1 5090/21/M/J/17/Q8

(a) With reference to **named** components, describe how the structure of one animal cell (for example from fresh liver) would appear different from a plant cell (for example from an onion epidermis).

.....

.....

.....

.....[4]

(b) State the relationship between structure and function for **both** of the following:
xylem vessels

.....

.....

red blood cells

.....

.....

.....[6]

2016

2 0610/42/M/J/16/Q2(a)

Fig. 2.1 is an electron micrograph showing the bacteria, *Vibrio cholerae*.



Fig. 2.1

STUDENTS RESOURCE

(i) Bacteria are prokaryotes.

State **two** distinguishing features of all prokaryotes.

1

2 [2]

(ii) The bacteria shown in Fig. 2.1 each have a flagellum.

Suggest the function of the flagellum in bacteria.

.....

.....

..... [1]

3 5090/22/M/J/16/Q6

(a) Describe the differences in structure and function between a cell wall and a cell membrane.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [6]

STUDENTS RESOURCE

Topic 1.2: Specialised Cells, Tissues & Organs

2019

1 5090/2&O/N/19/Q*

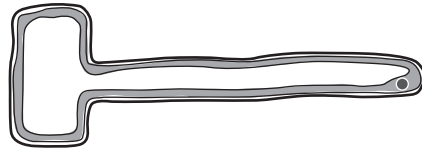
The diagrams show two types of cell specialised to carry out particular functions.

Name each type of cell shown and state the relationship between cell structure and cell function.

(a) cell from a plant

name of cell type

relationship between structure and function



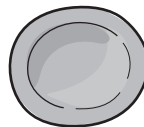
.....
.....
.....
.....

[4]

(b) cell from human blood

name of cell type

relationship between structure and function



.....
.....
.....
.....
.....

[6]

2016

2 5090/22/M/J/16/Q6

(b) Explain, with examples, the relationship between cells, tissues and organs.

.....
.....
.....
.....
.....

[4]

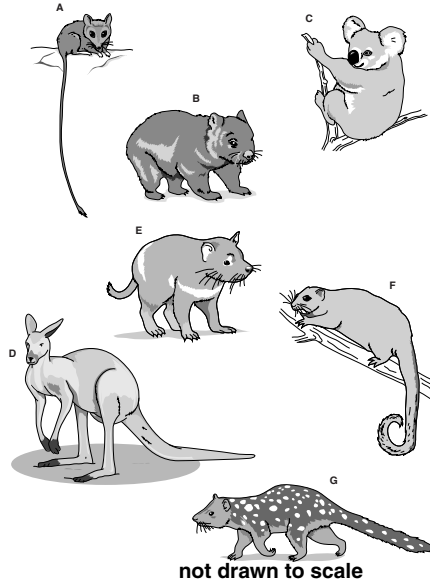
STUDENTS RESOURCE

Topic 2.1: Concept & Use of a Classification System

2015

1 0610/33/O/N/15/Q1(a)

Fig. 1.1 shows seven marsupial mammals.



not drawn to scale
Fig. 1.1

(i) State **one** visible feature that could be used to identify the marsupials in Fig. 1.1 as mammals.

..... [1]

(ii) Use the key to identify each species. Write the letter of each species (**A** to **G**) in the correct box beside the key. One has been done for you. **key**

1 (a)	tail visible	go to 2	
(b)	no tail visible	go to 3	
2 (a)	back feet at least twice as long as front feet	go to 4	
(b)	back feet and front feet of similar length	go to 5	
3 (a)	large ears relative to the size of the head	<i>Phascolarctos cinereus</i>	
(b)	small ears relative to the size of the head	<i>Vombatus ursinus</i>	
4 (a)	tail at least twice as long as body	<i>Sminthopsis longicaudata</i>	
(b)	tail less than twice as long as body	<i>Macropus rufus</i>	
5 (a)	uniform body colouring	<i>Paljara tirarensis</i>	
(b)	markings on body	go to 6	
6 (a)	white band across back and chest	<i>Sarcophilus harrisii</i>	
(b)	no white band across back and chest	<i>Dasyurus maculatus</i>	G

[3]

2 0610/32/O/N/15/Q1(a)

Fig. 1.1 shows a common emerald dove, *Chalcophaps indica*.



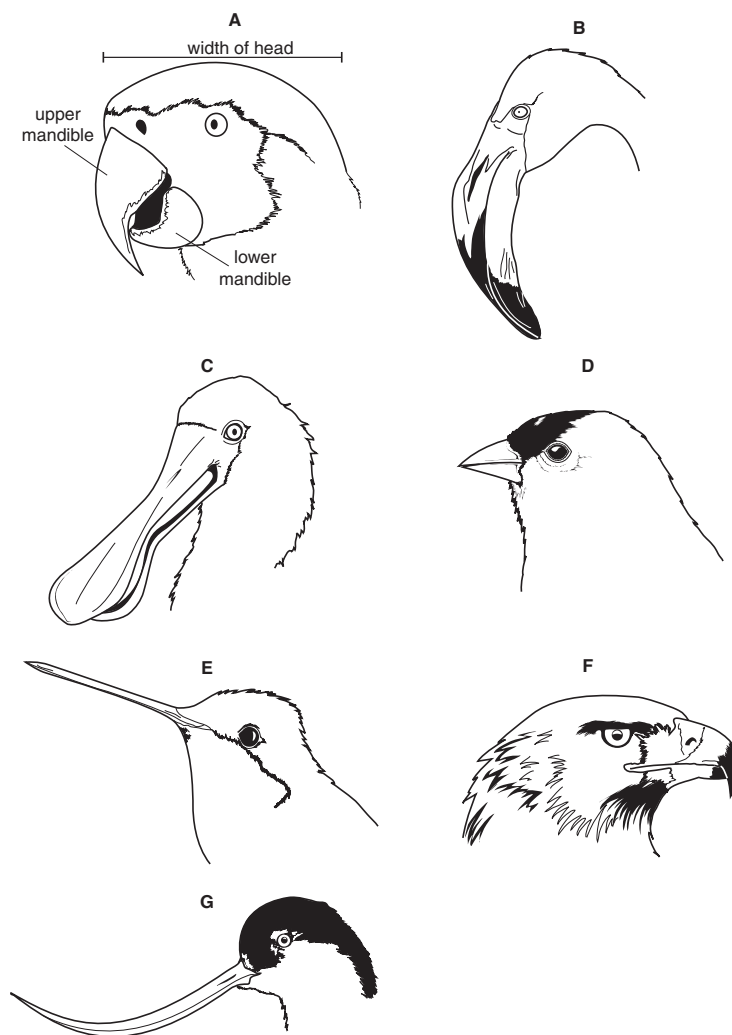
Fig. 1.1

- (a) Two distinguishing features of birds are beaks and wings.
State **one other** feature shown **only** by birds that is visible in Fig. 1.1.

.....[1]

- (b) Birds show variation in the sizes and shapes of their beaks. A beak is composed of an upper mandible and a lower mandible.

Fig. 1.2 shows the heads of seven different species of bird.



not drawn to scale
Fig. 1.2

STUDENTS RESOURCE

Use the key to identify each species. Write the letter of each species (A to G) in the correct box beside the key. One has been done for you.

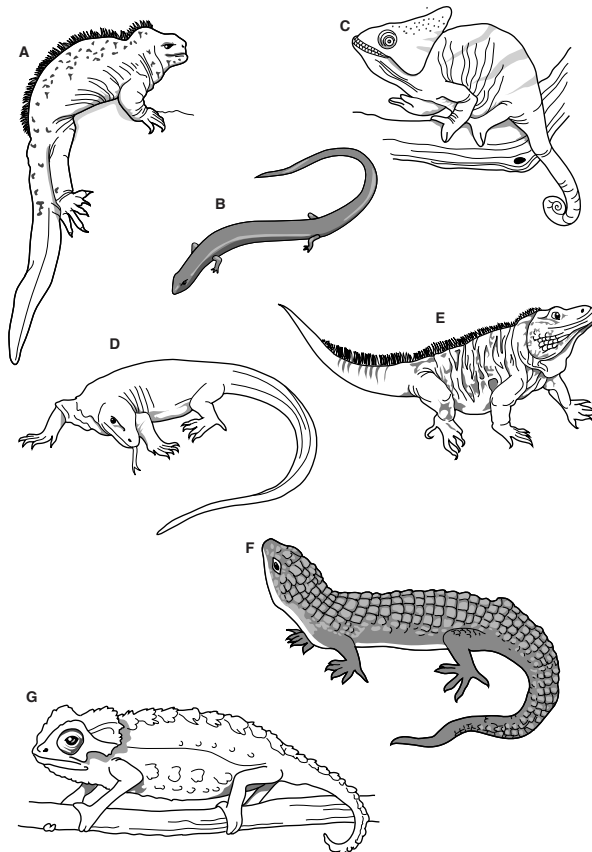
key

1	(a)	beak is shorter than the width of the head	go to 2	
	(b)	beak is longer than the width of the head	go to 4	
2	(a)	upper mandible is same length as the lower mandible	<i>Spinus tristis</i>	
	(b)	upper mandible is longer than the lower mandible	go to 3	
3	(a)	lower mandible is about half the length of the upper mandible	<i>Ara ararauna</i>	A
	(b)	lower mandible is more than half the length of the upper mandible	<i>Aquila chrysaetos</i>	
4	(a)	both mandibles widen at the end of the beak	<i>Platalea regia</i>	
	(b)	both mandibles are a similar width along their whole length	go to 5	
5	(a)	beak is straight	<i>Trochilus polytmus</i>	
	(b)	beak is curved	go to 6	
6	(a)	beak curves upwards	<i>Recurvirostra americana</i>	
	(b)	beak curves downwards	<i>Phoenicopterus minor</i>	

[3]

3 0610/31/O/N/15/Q1(a)

Fig. 1.1 shows seven lizards that are at risk of becoming extinct.



not to same scale

Fig. 1.1

STUDENTS RESOURCE

(a) (i) Name the vertebrate group that contains lizards.

.....[1]

(ii) Use the key to identify each species. Write the letter of each species (A to G) in the correct box beside the key. One has been done for you.

key

1	(a) feet with three toes	go to 2	
	(b) feet with five toes	go to 3	
2	(a) has a collar or crest on head	go to 4	
	(b) has no collar or crest on head	<i>Chalcides minutus</i>	
3	(a) spikes along back	go to 5	
	(b) no spikes along back	go to 6	
4	(a) ridges extend along back and tail	<i>Brookesia perarmata</i>	
	(b) no ridges along back or tail	<i>Calumma parsonii</i>	
5	(a) blunt, rounded head	<i>Amblyrhynchus cristatus</i>	
	(b) elongated head	<i>Cyclura lewisi</i>	
6	(a) large raised scales on skin	<i>Abronia graminea</i>	
	(b) scales on skin are not large or raised	<i>Varanus komodoensis</i>	D

[3]

STUDENTS RESOURCE

Topic 2.2: Features of Organisms

2022

1 5090/8%A/>/8&Q*

There are many different types of virus that can infect animal cells.

(a) Compare the **structure** of a typical virus with a typical animal cell.

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

2020

2 0610/43/M/J/20/Q5(a)

Bacteria are classified in the Prokaryote kingdom.

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

1

2

[2]

3 0610/41/M/J/20/Q5(a&b)

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.

1

.....

2

.....

[2]

STUDENTS RESOURCE

(b) Fig. 5.1 shows five species of ciliate that are found in sewage treatment works.

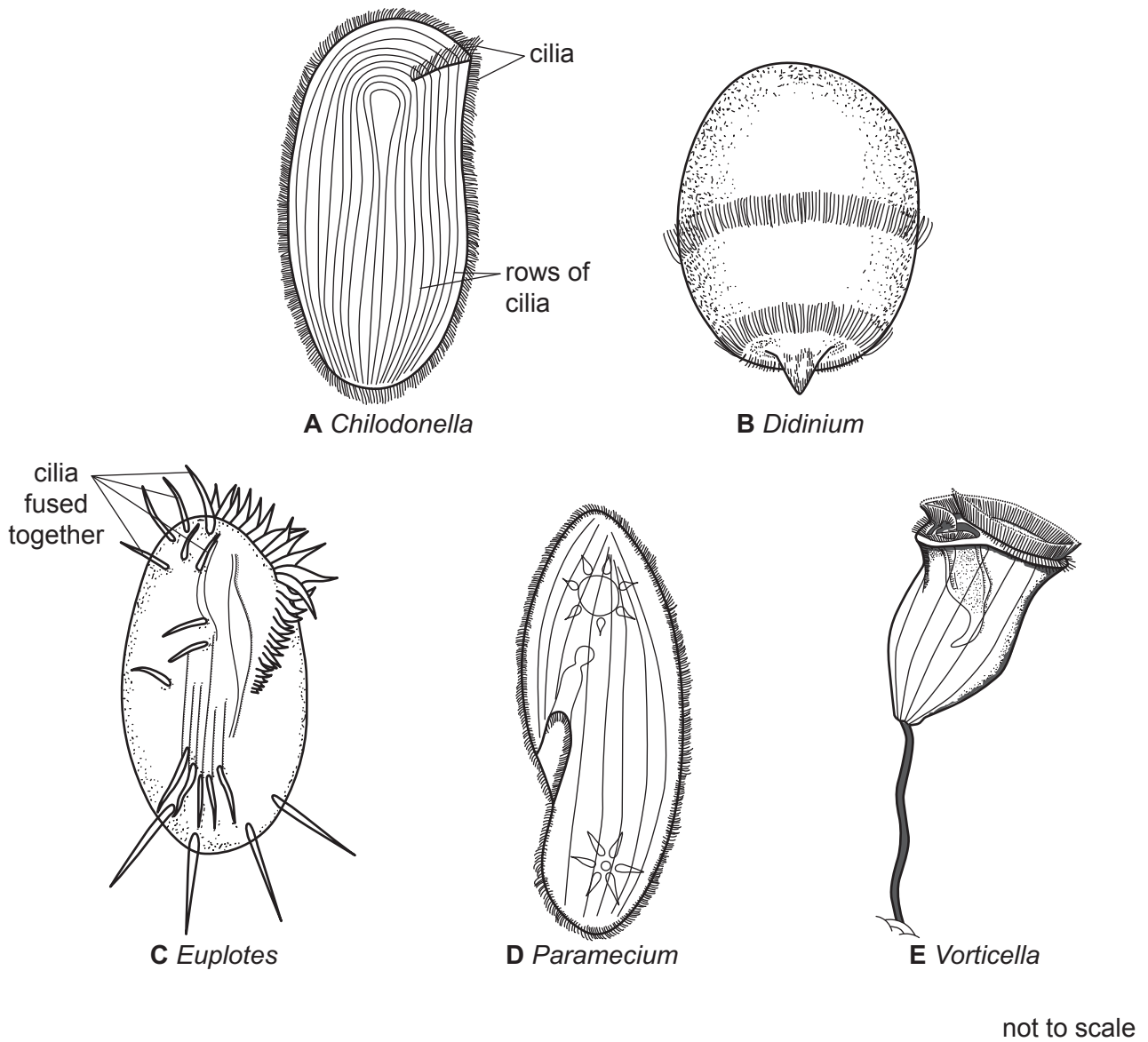


Fig. 5.1

STUDENTS RESOURCE

Fig. 5.2 is a dichotomous key to identify the ciliates shown in Fig. 5.1.

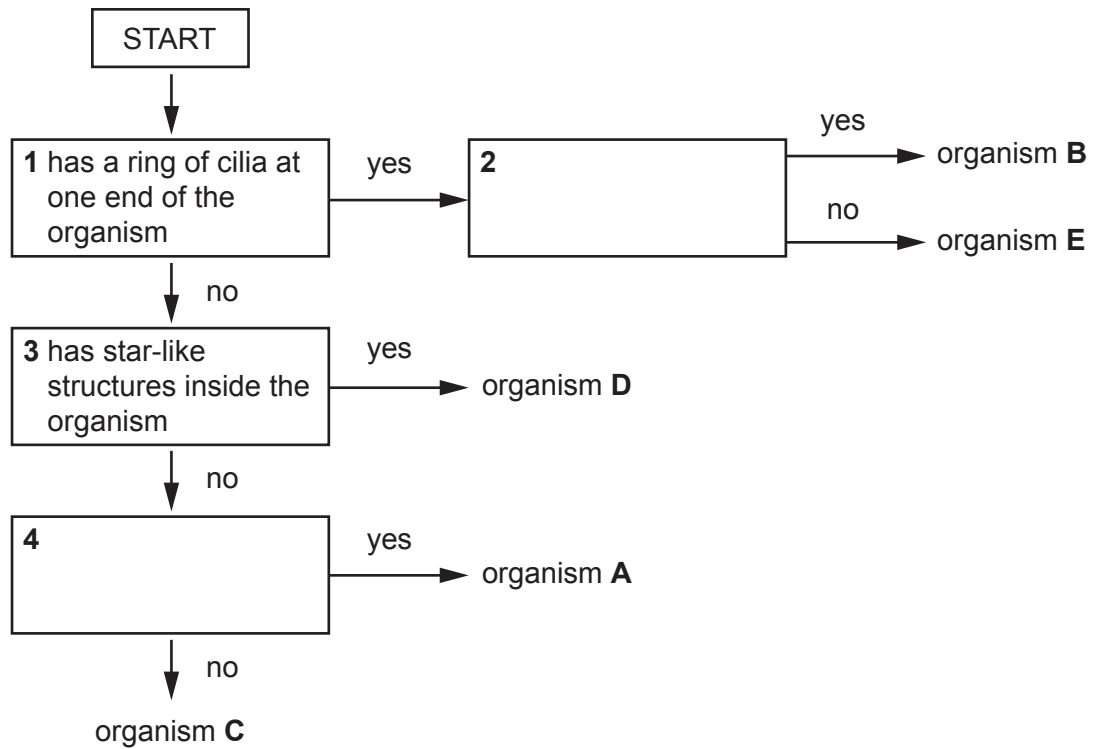


Fig. 5.2

Complete the key in Fig. 5.2 by writing suitable statements:

- for box 2 to distinguish species **B** and **E**
- for box 4 to distinguish species **A** and **C**.

text for box 2

.....

.....

text for box 4

.....

.....

[2]

STUDENTS RESOURCE

2019

4 0610/43/O/N/19/Q1

(a) The ant-mimic jumping spider, *Myrmarachne formicaria*, is shown in Fig. 1.1.

The common name of this species describes its behaviour. It is an arachnid that tricks its prey because it looks like the insects that it eats.



Fig. 1.1

(i) Suggest which trophic level in a food chain *M. formicaria* could belong to.
..... [1]

(ii) State the genus of the spider shown in Fig. 1.1.
..... [1]

(iii) Some keys use paired choices of features to identify species such as the ant-mimic jumping spider.
State the name of this type of key.
..... [1]

STUDENTS RESOURCE

(b) Spiders are classified as arachnids. Arachnids are one of the main groups of arthropods.

Fig. 1.2 shows diagrams of six arthropods, four of which are arachnids.

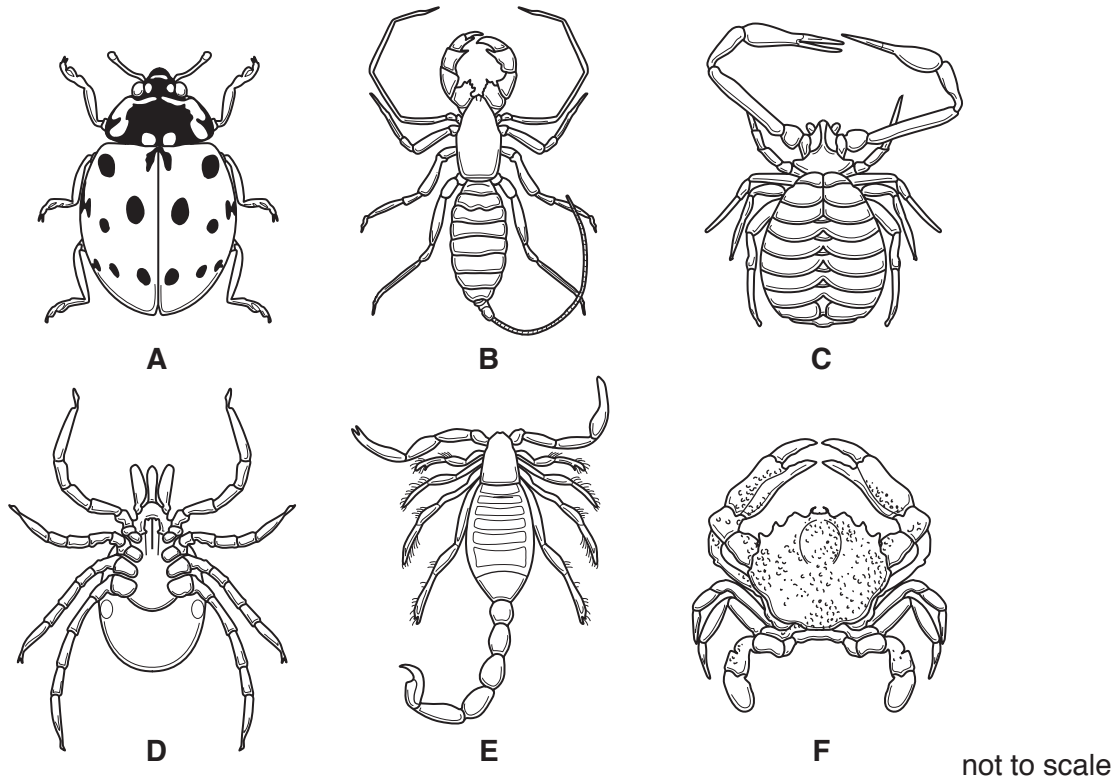


Fig. 1.2

(i) State **two** common features of all the arthropods, visible in Fig. 1.2.

- 1
- 2 [2]

(ii) State **two** common features of all arachnids that can be used to distinguish them from other arthropods.

- 1
- 2 [2]

(iii) State the letters of the **four** arachnids shown in Fig. 1.2.

-
-
-
- [2]

STUDENTS RESOURCE

(c) The features shown in Fig. 1.2 are morphological features. Many traditional methods of classification used morphology.

State the name of one **other** type of feature that can also be used in classification.

..... [1]

5 0610/42/O/N/19/Q5(e)

Wheat plants are monocotyledons.

State **one** feature of monocotyledons that can be used to distinguish them from dicotyledons.

..... [1]

6 0610/42/O/N/19/Q1(a&c)

(a) Fig. 1.1 shows four arthropods.

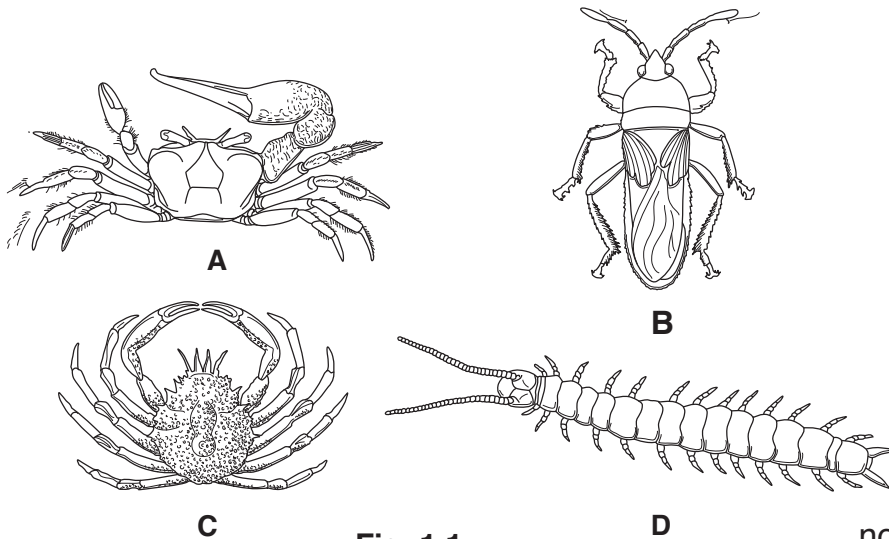


Fig. 1.1

not to scale

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

1

2

[2]

STUDENTS RESOURCE

(ii) Fig. 1.2 is a dichotomous key for the arthropods shown in Fig. 1.1.

Complete Fig. 1.2 by writing suitable statements in:

- box 2 to identify species **B**
- box 3 to separate species **C** and **A**.

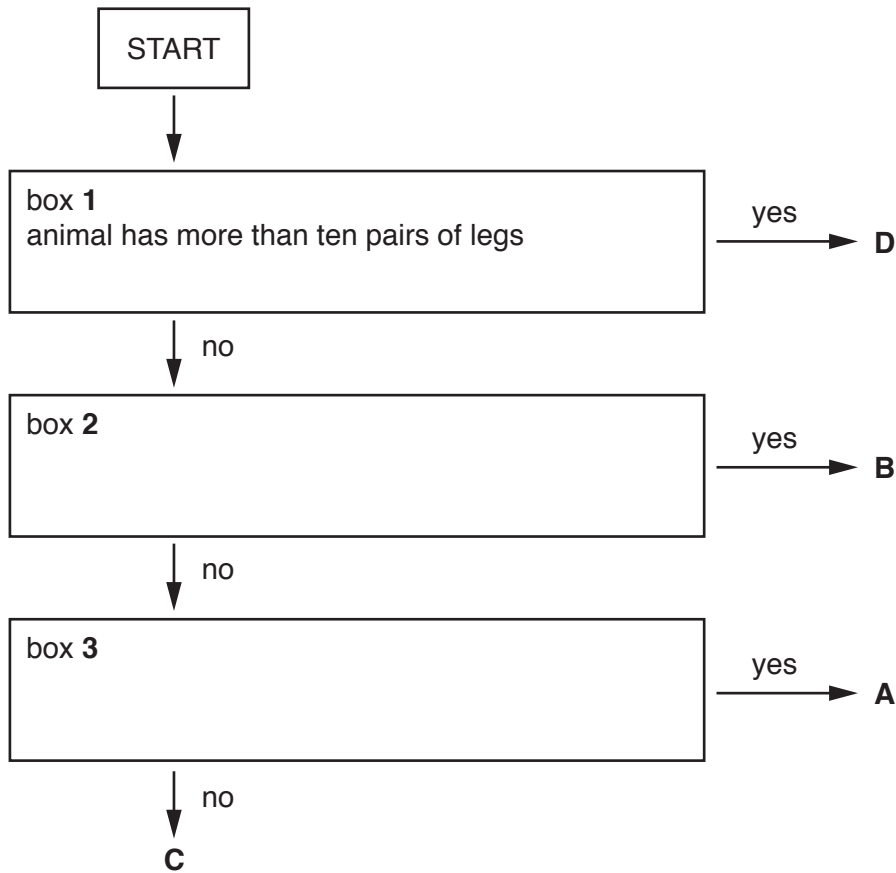


Fig. 1.2

[2]

(b) DNA can be extracted from the webs of spiders. This DNA can be used to identify the species of spider that made the web, and the species of prey caught in the web.

Explain how DNA extracted from spider webs can be used to identify different species.

.....

.....

.....

.....

.....

.....

[2]

STUDENTS RESOURCE

7 0610/41/O/N/19/Q1

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.

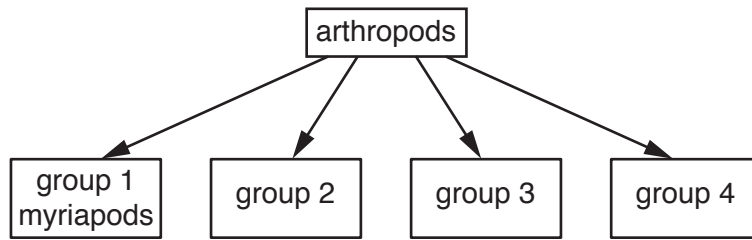


Fig. 1.1

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

- 1
- 2

[2]

(c) Myriapods can be classified into four classes, **1, 2, 3** and **4**.

Fig. 1.2 is a dichotomous key that can be used to distinguish the four classes of myriapods.

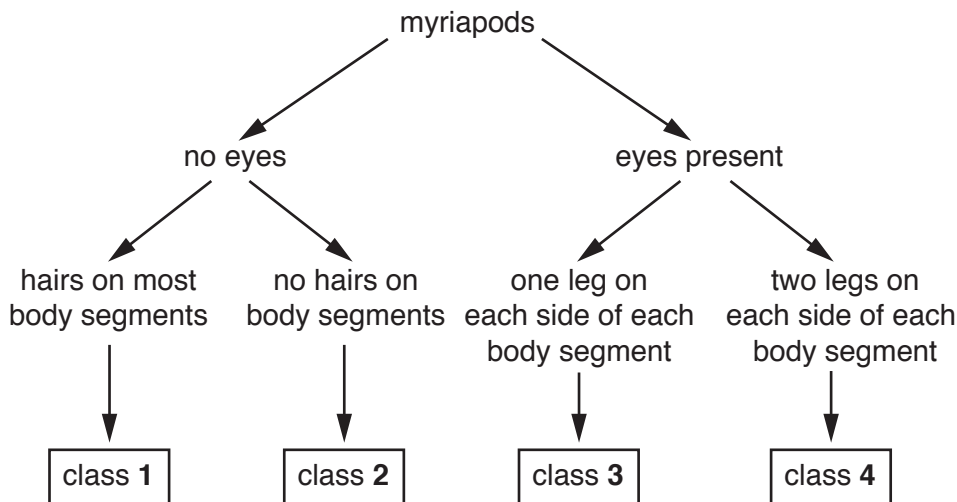


Fig. 1.2

STUDENTS RESOURCE

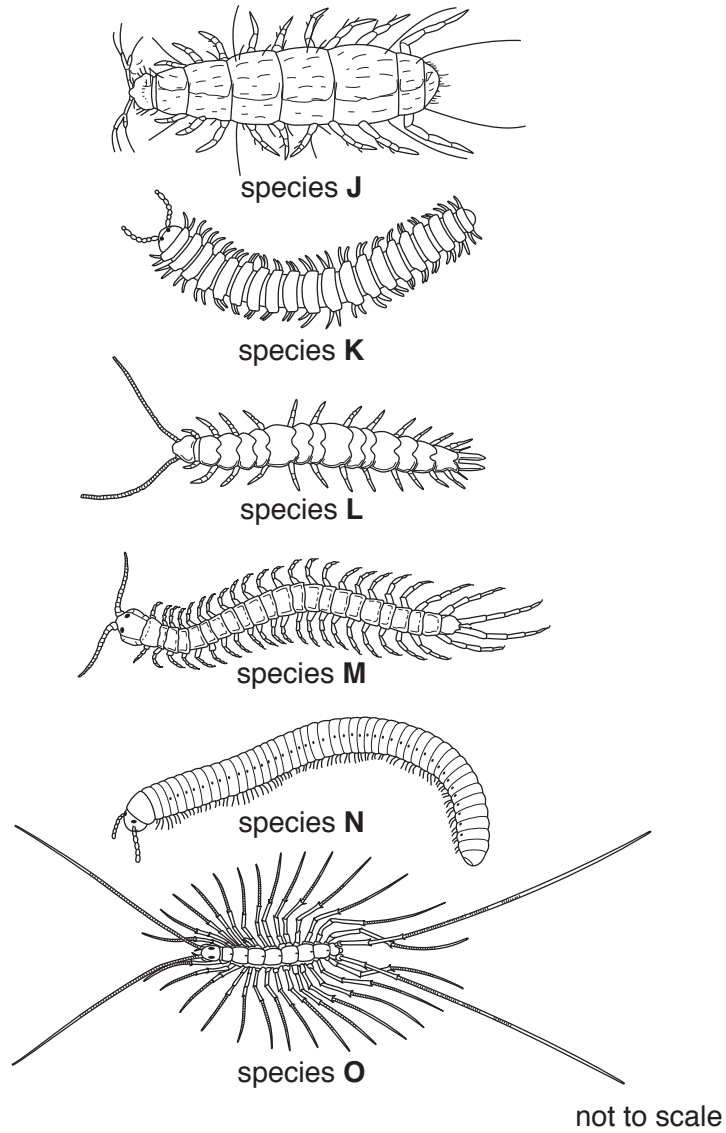


Fig. 1.3

Complete Table 1.1 by using the key in Fig. 1.2 to classify the six myriapods in Fig. 1.3 into the four classes.

Table 1.1

class	letter(s) of species from Fig. 1.3 in each class
1	
2	
3	
4	

STUDENTS RESOURCE

[3]

(d) Fig. 1.4 is a photograph of the myriapod, *Apheloria virginensis*.

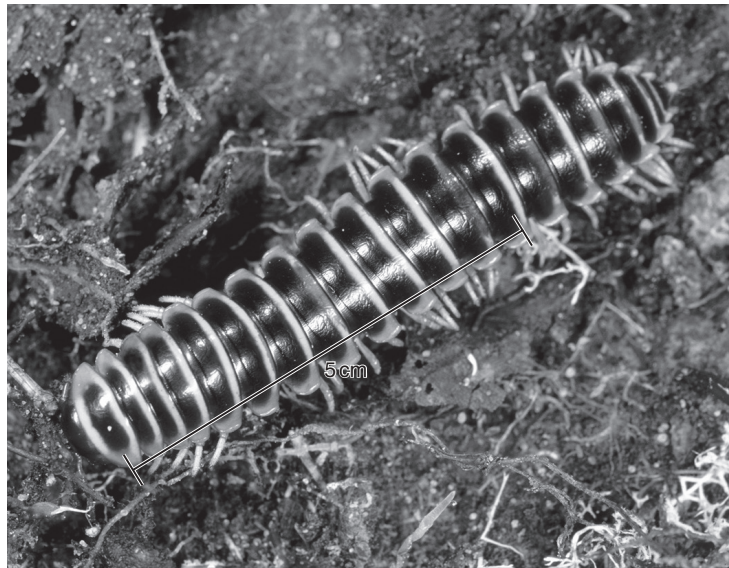


Fig. 1.4

(i) State the genus name and kingdom name for the myriapod shown in Fig. 1.4.

genus

kingdom

[2]

(ii) *A. virginensis* releases the poison cyanide when it is attacked by predators. Cyanide stops enzymes in the mitochondria from functioning. Suggest why cells die if the mitochondria do not function.

.....
.....
..... [1]

STUDENTS RESOURCE

8 0610/43/M/J/19/Q1(a)

Bacteria are classified in the Prokaryote kingdom.

(a) State **two** features of animal cells that are **not** found in bacteria.

- 1
- 2 [2]

9 0610/41/M/J/19/Q1

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

(a) Define the term *species*.

-
-
-
-
- [2]

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]

STUDENTS RESOURCE

10 0610/42/F/M/19/Q6(a)

Fig. 6.1 is a diagram of the virus that causes measles.

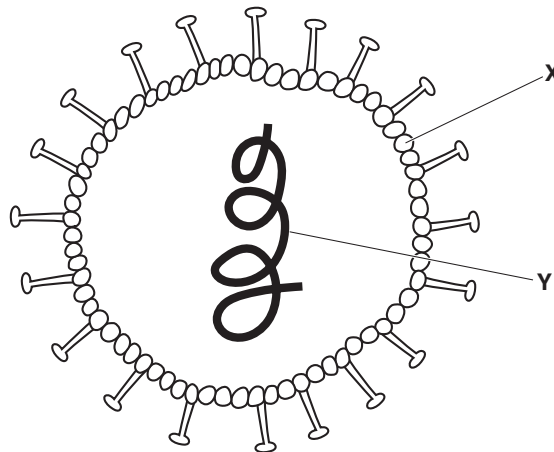


Fig. 6.1

(a) (i) State the name of the parts of the virus shown in Fig. 6.1 labelled X and Y.

X

Y

[2]

(ii) Bacteria belong to the Prokaryote kingdom.

State **two** ways in which the structure of bacteria differs from the structure of viruses.

1

2

[2]

STUDENTS RESOURCE

2018

11 0610/42/M/J/18/Q5(a)

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



Fig. 5.1

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

- 1
- 2
- 3

[3]

2017

12 0610/43/O/N/17/Q5(a)(ii)

State **two** characteristics of fungi that are used to distinguish them from plants.

- 1
- 2

[2]

13 0610/42/O/N/17/Q5(a&b)

Fig. 5.1 shows the bacterium *Helicobacter pylori*, which is a human pathogen.



Fig. 5.1

(a) State the genus of *Helicobacter pylori*.

.....[1]

(b) *H. pylori* is placed in the prokaryote kingdom.

State **two** structural features that *H. pylori* shares with other prokaryotes.

- 1
- 2

[2]

STUDENTS RESOURCE

14 0610/41/O/N/17/Q6(a&b)

Viruses can cause diseases.

(a) (i) State **two** other features of all viruses.

1

2

[2]

(b) Fig. 6.1 shows four different viruses.

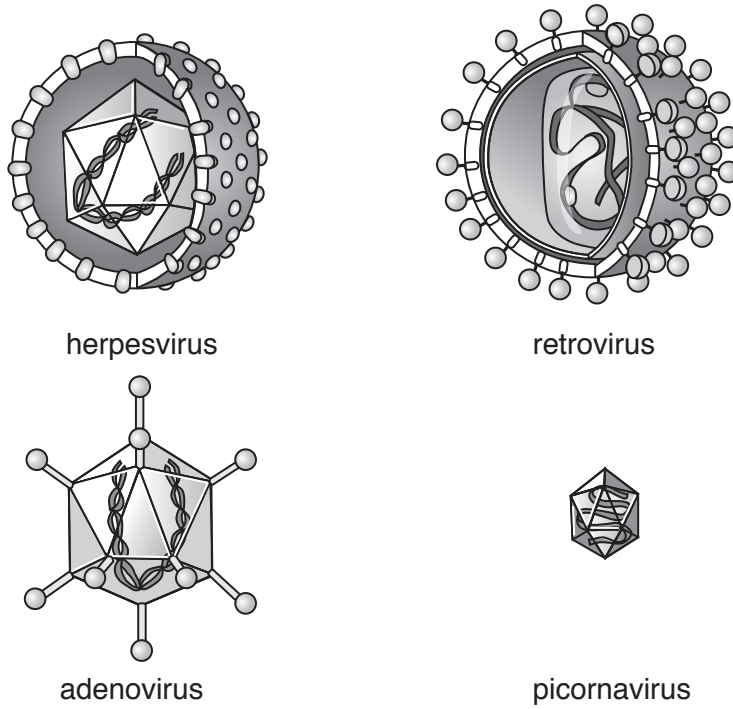


Fig. 6.1

Suggest **one** feature that could be used to classify viruses into groups.

.....

.....[1]

20%*

15 0610/43/O/N/16/Q6(a)

Name **one** feature of dicotyledonous leaves that distinguishes them from monocotyledonous leaves.

.....[1]

STUDENTS RESOURCE