SUB:- BIOLOGY IGCSE GRADE ___

Chapter 1-Classification of living organism

Name of the student:-_____

Q.1 Fig. 1.1 is a diagram of an animal cell

Figure 1.1

(a)Label three structures on the cell shown in Fig. 1.1, using label lines and the names of the structures. [3]

(b) State two structures that are found in plant cells but not in animal cells.

1 .....

2 .....[2]

[Total: 5]

Q.2 (a) Fig. 2.1 is a photograph of a lobster, which is an arthropod.

Figure 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]

(d) Many species of crustaceans live in seas and oceans.

Some of these species have become endangered.

Describe reasons why some marine crustacean species have become endangered.

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 8]

Q.3 A new species of frog was discovered in 2009 in the Amazon rainforest in Peru. Fig. 3.1 shows this frog, Osteocephalus castaneicola

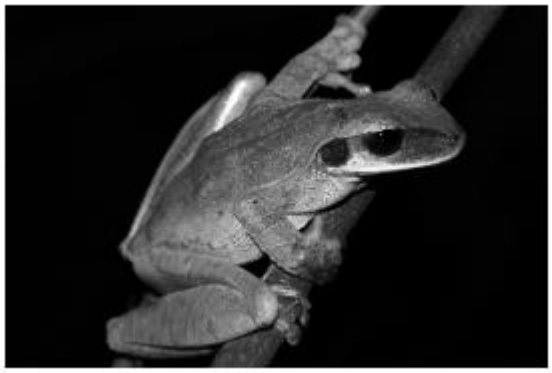


Figure 3.1

(a) State the genus of this animal.

.....[1]

(b) Give the name of the Class to which it belongs and also give 2 features of this animal because of which it is in the Class.

……

……

……

……

……...[3]

In the past, anatomy was a way to classify species. DNA is now used to aid the classification of organisms.

(c)

(i) Draw and annotate a diagram to show the structure of DNA. [3]

(ii) Describe how DNA can be used to classify organisms.

.....

.....

.....

.....

.....

[2]

(d) DNA controls cell function by controlling the production of proteins.
(i) Proteins are coded for by a length of DNA. What is the name given to the length of DNA which codes for a protein?
.....[1]

(e) Modern methods of classification rely on the analysis and comparison of base sequences in DNA.

Describe the type of evidence that scientists used for classifying organisms before they were able to sequence DNA.

.....

.....

.....

.....

..... [2]

Total -12

Q.4Viruses can cause diseases.
(a) (i) State **two** other features of all viruses.
1 .....

2 .....

[2]
(ii) Describe how vaccination can prevent the spread of disease.
.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

[5]

(b) Fig. 4.1 shows four different viruses.

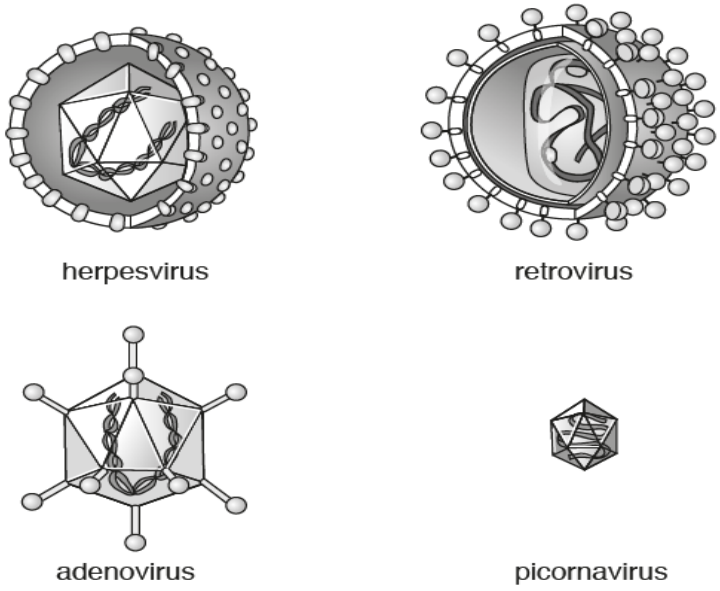


Figure 4.1

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

.....

.....

[1]

[Total: 8]

Q.5 A DNA molecule has two strands as shown in Fig 5.1

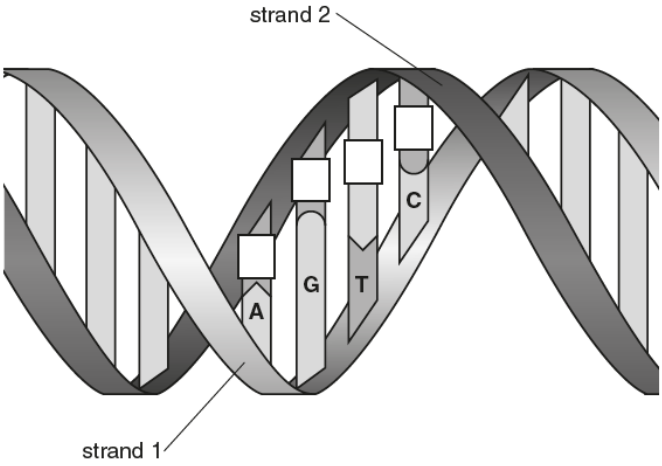


Figure 5.1

(a) (i) Fill in the boxes on Fig. 5.1 to show the letter of the bases on strand 2 that will pair with the corresponding bases on strand 1. [2]

(ii) State the name for the structure of a DNA molecule as shown in Fig. 5.1.

.....

.....[1]

When molecules of DNA are used to classify species, only one of the two DNA strands is sequenced.

First the DNA sequence from one strand of a DNA molecule from each species is lined up against one strand from another species.

The bases of the DNA sequences from the same strand can then be compared with each other.

Fig. 5.2 shows a short section from the DNA sequences of eight plant species. There are ten differences between species **A** and species **B**. These differences are shown in Fig. 5.2.

Species **A**:	CTCCTCGGGT GACGGCCTAG CCCGTTGACG AATCCCATTC CTAAACTTT
Species **B**:	CTCCTAGGGT GCAGGACTAG CCCGTTGACG AATCCCATTC CCAAGA
Species **C**:	CTCATAGGGT GCAGGCCTAG CCCGTTGACG AATCACATTC CGATT
Species **D**:	CTCATAGGGT GCAGGCCTAG CCCCTTGACG AATCCAATTC CGCTT
Species **E**:	CTCATAGGGT GCAGGCCTAG CCCGTTGACG AATCCAATTC CGCTT
Species **F**:	CTCCTAGGTT GCAGGCCTAG CCCTTTGAAG AATCACATTC CCCAA
Species **G**:	CTCCTCGGGT GCAGGCATAG CCCTTTGACG AATCCCCTTC CGAAA
Species **H**:	CTCCTAGGGT GCAGGCATAG CCCTTTGACG AATCCCCTTC CAAAAT

Figure 5.2

(b) The number of differences between the DNA sequences of the eight species shown in Fig. 5.2 are recorded in Table 5.1.
Count the number of differences between the DNA sequences shown in Fig. 5.2 for:
• species **C** and species **D**
• species **G** and species **H**
Write your answers in Table 5.1. [2]

	species **A**	species **B**	species **C**	species **D**	species **E**	species **F**	species **G**	species **H**
species **A**		10	10	13	12	11	10	9
species **B**			7	8	7	7	7	6
species **C**					3	7	8	8
species **D**					1	9	9	8
species **E**						9	8	10
species **F**							6	7
species **G**								
species **H**								

Table 5.1

c) The most closely related species have the fewest differences between their DNA sequences.
State which **two** plant species shown in Table 5.1 are most **distantly related** to each other.
.....
.....[1]
(d) The most closely related species have the shortest distance from a branching point on a classification tree.
Use the information in Table 5.1 to complete the classification tree in Fig. 6.3.
Write the letter corresponding to species **B**, **C**, **D** and **G** in the box next to the correct branch of the classification tree. [3]

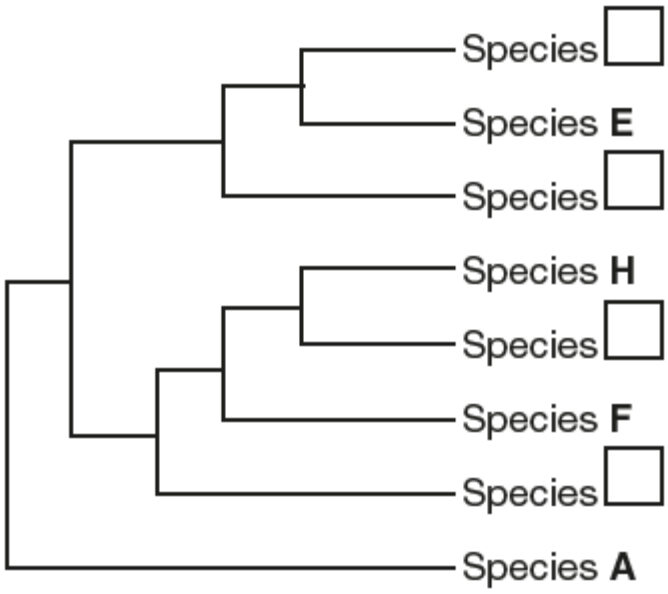


Figure 5.3

Q.6 Fig. 6.1 shows a bacterium, a virus and a fungus.

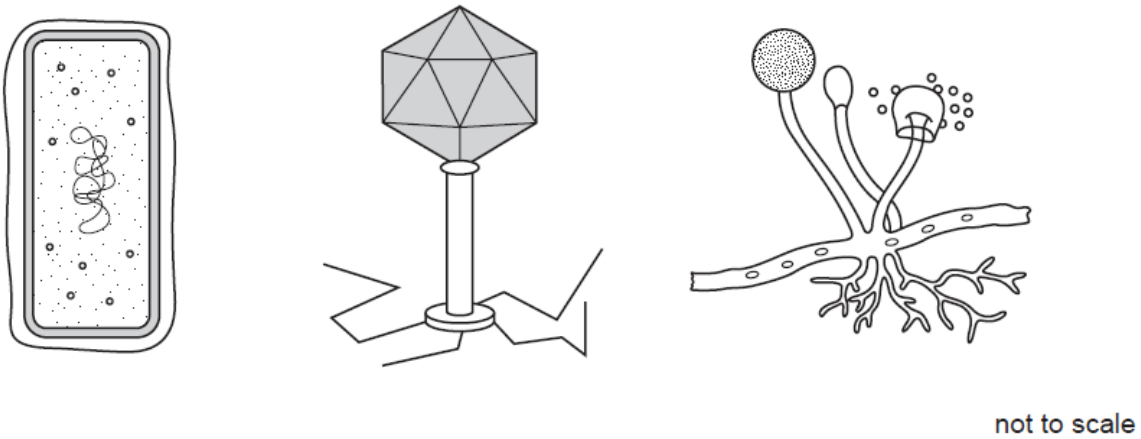


Figure 6.1

(a) Complete the table to compare the three organisms shown in Fig. 1.1 by using a tick (√) to indicate if the organism shows the feature, or a cross (x) if it does not. The first row has been completed for you.

Feature	Bacteria	Fungi	Virus
Produces spores	x	√	
Hyphae			
Capusle			
Nucleus			

(3)

(b) Explain how fungus is well adapted to obtain its food.

……

……

……

……

……

……..

(3)

(c)Explain how the fungus spreads to new sources of food.

……

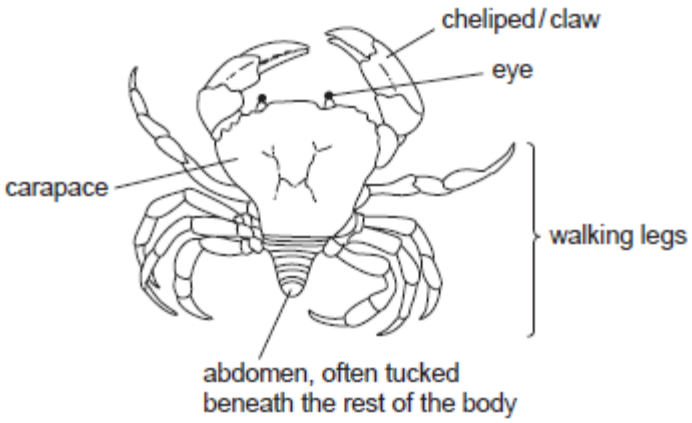
……

……

…….[2]

(Total 8)

Q.7 Crabs are classified, along with prawns, shrimps and lobsters, as crustaceans. Most crabs live in the sea, although some live in freshwater and there are a few land-dwelling crabs. Fig.7.1 shows the structure of a typical crab.



a) State the group of animals that includes crustaceans, insects, arachnids and myriapods.

……..[1]

Fig. 7.2 shows four different species of crab.

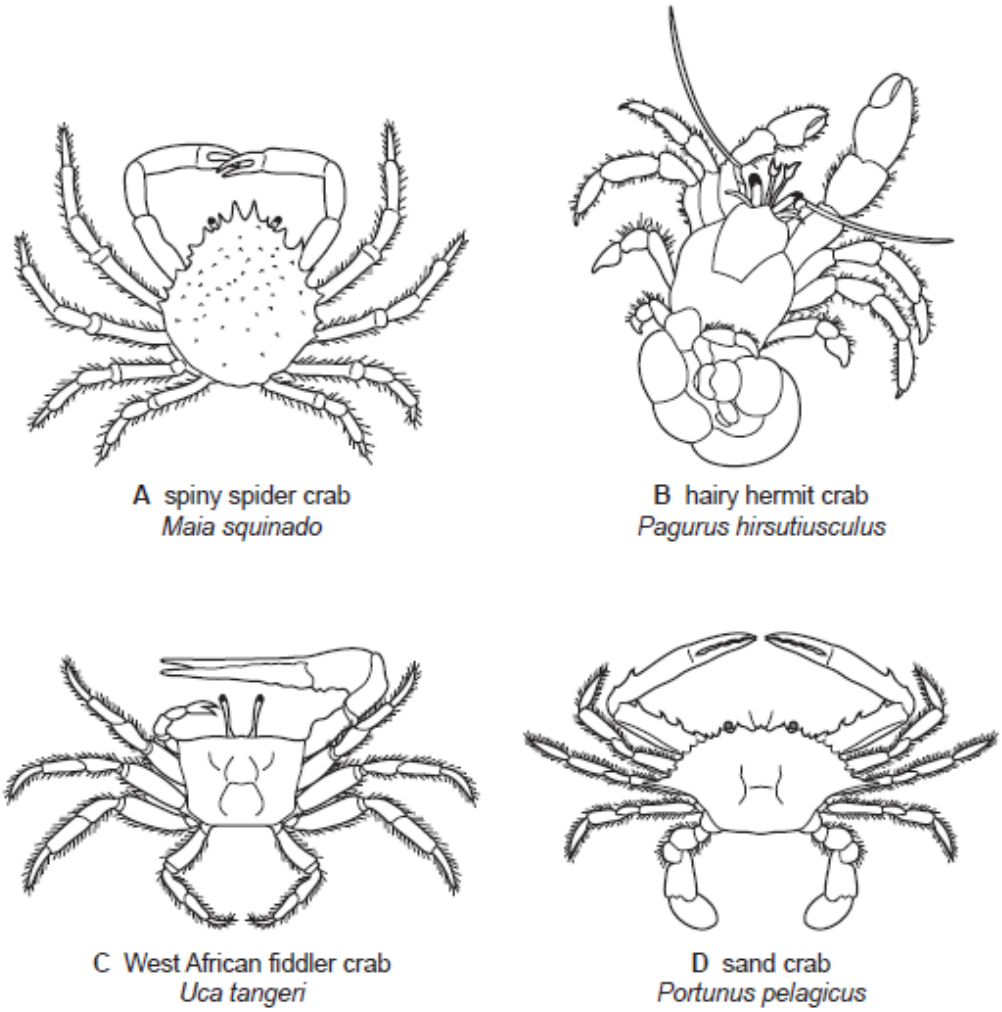


Figure 7.2

(b) Biologists use dichotomous keys to identify different species.

Use Fig. 1.1 and Fig. 1.2 to state one visible feature of each species of crab A, B, C and D, that could be used in a dichotomous key to identify crabs.

A……

……

B……

……

C……

……

D……

…… (4)

(b) Crabs produce huge numbers of offspring, but their populations remain fairly constant from year to year. Explain why.

……
……
……
……
……
……
…… .(3)

(c) Emergency medical packs contain bandages made from chitosan. Chitosan comes from the exoskeleton of crustaceans and has a positive charge to attract red blood cells. It helps blood clot quickly and also has antibacterial properties. Explain the benefits of using bandages made from chitosan.

……
……
……
……
……
……
…….(3)

Total 11

Q.8 Molluscs are important animals in many aquatic and terrestrial ecosystems. Fig.8.1 shows four species of mollusc that live in the sea.

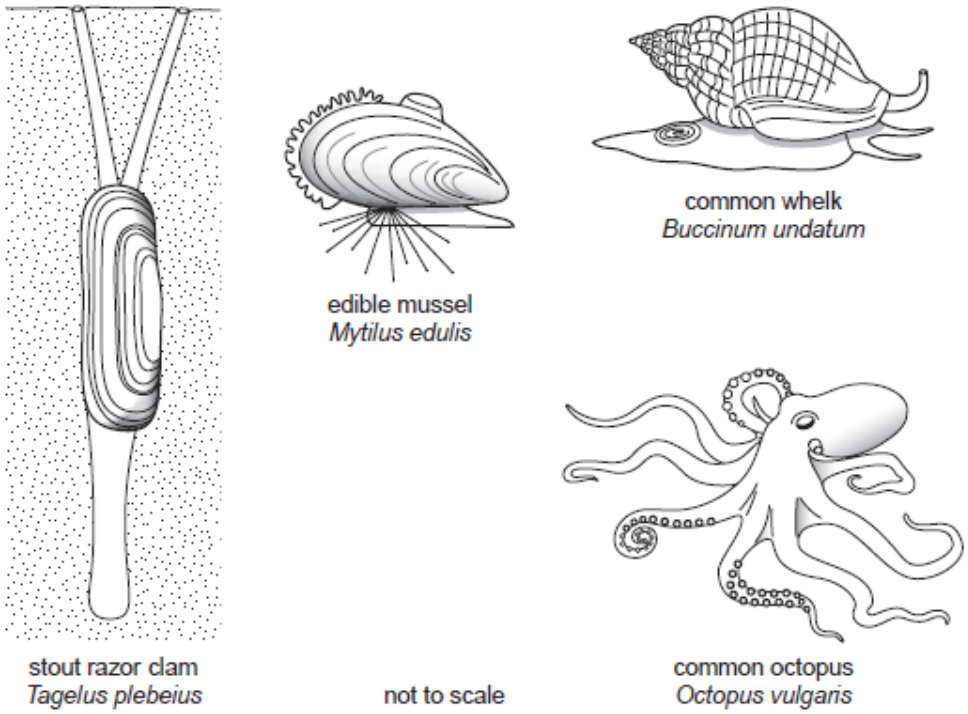


Figure 8.1

(a) State two features shown by all mollusc species.

1……

2……

[2]

(b)State two features, visible in Fig. 1.1, in which the octopus differs from the other three molluscs.

1……

2……[2]

(c) The edible mussel, Mytilus edulis, is attached to rocks that are exposed to the air at low tide. Use Fig. 8.1 to suggest how an edible mussel is adapted to attach to rocks and survive when exposed to the air

……

……

……

……
……(2)

(d) The zebra mussel, Dreissena polymorpha, is a freshwater mussel that originates from rivers in southern Russia.

The mussel was introduced into the Great Lakes of North America and has increased in huge numbers with serious effects on the food webs of the lakes.

Explain why an introduced species, such as the zebra mussel, can have serious effects on the populations of the species that are already living in the area.

……
……
……
……
……
……
……
……
……
……(3)

Q.9 a. Soybean is a dicotyledonous plant.

State three features which are only found in dicotyledonous plants.

……
……
……

(3)

b. The tiger lily plant is a monocotyledon.

State three features which are only found in monocotyledonous plants.

……

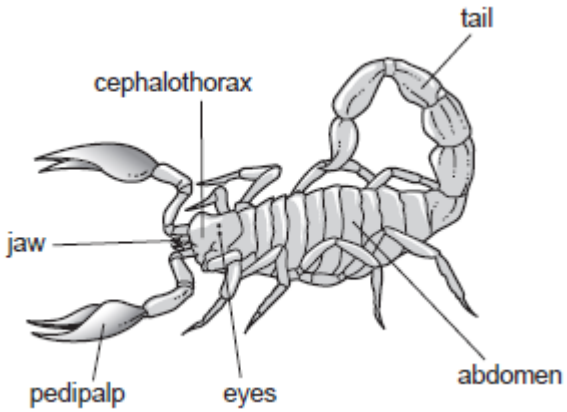
……

……

(3)

Q.10Arachnids, crustaceans, insects and myriapods are all classified as arthropods.

Scorpions, such as Heterometrus swammerdami shown in Fig. 1.1, are arachnids.



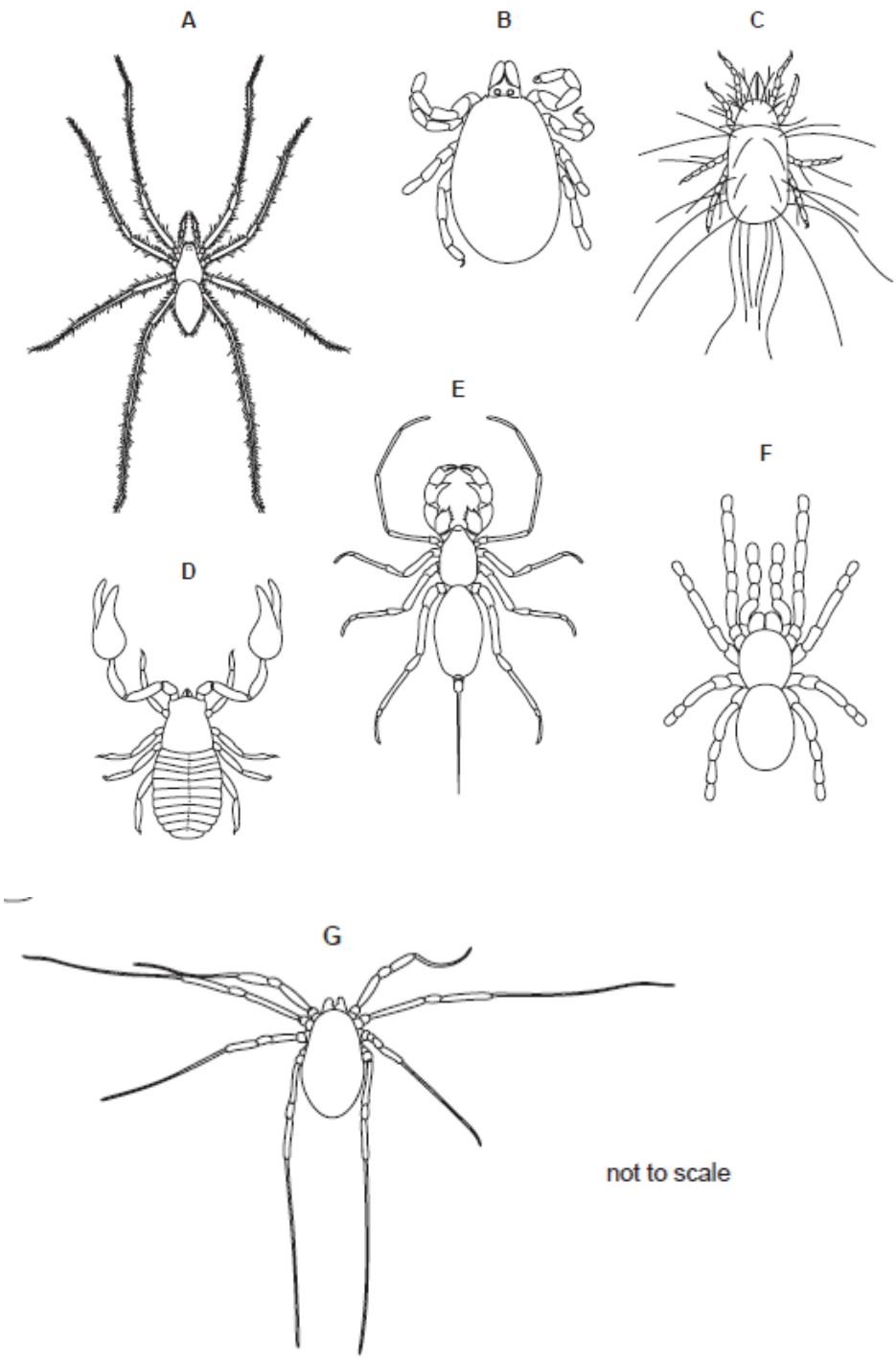
(a) State three features, shown by H. swammerdami and visible in Fig. 1.1, that arachnids share with other arthropods.

1……

2……

3……(3)

(b) Fig. 1.2 shows seven species of arachnid.



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)	Abdomen with a tail	*Abaliella dicranotarsalis*	**E**
(b)	Abdomen without a tail	go to 2	
2 (a)	Legs much longer than abdomen and cephalothorax	go to 3	
(b)	Legs not much longer than abdomen and cephalothorax	go to 4	
3 (a)	Hairs on the legs	*Tegenaria domestica*	
(b)	No hairs on the legs	*Odielus spinosus*	
4 (a)	Cephalothorax or abdomen segmented	*Chelifer tuberculatus*	
(b)	Cephalothorax and abdomen not segmented	go to 5	
5 (a)	Abdomen and cephalothorax about the same size	*Poecilotheria regalis*	
(b)	Abdomen larger than cephalothorax	go to 6	
6 (a)	Body covered in long hairs	*Tyroglyphus longior*	
(b)	Body not covered in hairs	*Ixodes hexagonus*	

(4)