

## Chapter 4: Kingdom Animalia

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### EXERCISE, EXERCISES [PAGES 42 - 43]

#### Exercise | Q 1. (A) | Page 42

Choose the correct option.

Which of the following belongs to a minor phylum?

1. **Comb jelly**
2. Jelly fish
3. Herdmania
4. Salpa

### SOLUTION

**Comb jelly**

#### Exercise | Q 1. (B) | Page 42

Choose the correct option.

Select the animal having venous heart.

1. Crocodile
2. Salamander
3. **Rohu**
4. Toad

### SOLUTION

**Rohu**

#### Exercise | Q 1. (C) | Page 42

Choose the correct option.

In Ascaris, \_\_\_\_\_.

1. mesoglea is present
2. endoderm is a discontinuous layer
3. **mesoderm is present in patches**
4. body cavity is absent

### SOLUTION

In Ascaris, **mesoderm is present in patches.**

#### Exercise | Q 1. (D) | Page 42

Choose the correct option.

Which of the following is incorrect in case of birds?

1. **Presence of teeth**
2. Presence of scales
3. Nucleated RBCs
4. Hollow bones

### **SOLUTION**

#### **Presence of teeth**

#### **Exercise | Q 1. (E) | Page 42**

#### **Choose the correct option.**

Chitinous exoskeleton is a characteristic of \_\_\_\_\_.

1. Dentalium
2. Antedon
- 3. Millipede**
4. Sea urchin

### **SOLUTION**

Chitinous exoskeleton is a characteristic of millipede.

#### **Exercise | Q 2. (A) | Page 42**

#### **Answer the following question.**

Reptiles are known for having three-chambered heart. Which animal shows a near four-chambered condition in reptiles?

### **SOLUTION**

Crocodiles have a four chambered heart.

#### **Exercises | Q 2. (B) | Page 42**

#### **Answer the following question.**

The circulatory system has evolved from open to closed type in Animal kingdom. Which Phylum can be called first to represents closed circulation?

### **SOLUTION**

Phylum Annelida is the first phylum to represent closed circulation.

#### **Exercise | Q 2. (C) | Page 42**

#### **Answer the following question.**

Pinna is part of the external ear and it is found in mammals. Do aves and reptiles show external ear in any form?

### **SOLUTION**

No, Aves and Reptiles do not show external ear in any form. They possess tympanum which represents the ear.

#### **Exercise | Q 2. (D) | Page 42**

#### **Answer the following question.**

Fish and frog can respire in water. Can they respire through their skin? If yes, why do they have gills?

### **SOLUTION**

1. Yes, fishes and frogs can respire through their skin.
2. The larval stage of frog i. e. tadpole respire through gills. During metamorphosis, tadpoles lose their gills and develop lungs.
3. Frogs do not have scales and breathe through their skin underwater.
4. Fishes respire primarily via gills. The body of fishes is covered with scales which limits cutaneous respiration in them.

### Exercise | Q 2. (E) | Page 42

#### Answer the following question.

Birds need to keep their body light to help in flying. Hence, they show presence of some organs only on one side. How their skeleton helps in reducing their weight?

#### **SOLUTION**

1. In birds, the forelimbs are modified into wings for flying.
2. They possess a stream-lined body to reduce resistance during flight.
3. Bones are hollow or pneumatic to reduce body weight.
4. In order to reduce body weight, urinary bladder is absent. Also, females possess only the left ovary and oviduct.
5. The body is covered by feathers to facilitate flying.

### Exercise | Q 2. (F) | Page 42

#### Answer the following question.

Cnidarians and Ctenophorans are both diploblastic. Which other character do they have in common, which is not found in other phyla?

#### **SOLUTION**

Cnidarians and ctenophorans show tissue level of body organization. They have blind sac body plan and radially symmetrical body.

### Exercise | Q 2. (G) | Page 42

#### Answer the following question.

Crab and Snail both have a protective covering. Is it made up of the same material?

#### **SOLUTION**

No, the protective covering is not made up of same material in crab and snail. The protective covering of crabs is made up of chitin and that of snails is made up of calcium carbonate.

### Exercise | Q 2. (H) | Page 42

#### Answer the following question.

Sponge and sea star show calcareous protective material. Do they belong to the same Phylum?

### **SOLUTION**

No, they do not belong to same phylum. Sponges belong to phylum Porifera and sea star belongs to phylum Echinodermata.

### **Exercise | Q 2. (I) | Page 42**

**Answer the following question.**

Fish and snake both have scales. How do these scales differ from each other?

### **SOLUTION**

Fishes have dermal scales covering the body surface whereas snakes have epidermal scales or scutes.

### **Exercise | Q 2. (J) | Page 42**

**Answer the following question.**

Lower Phyla like Arthropods and Cnidarians show metamorphosis. Is it also found in any class of Phylum Chordata?

### **SOLUTION**

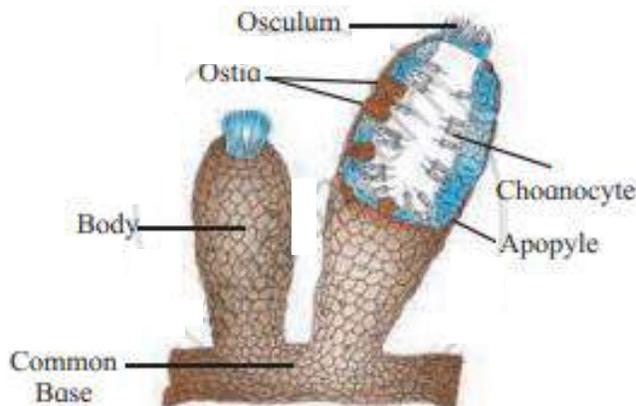
Yes, it is also found in class Amphibia of phylum Chordata.

### **Exercise | Q 3. (A) | Page 42**

**Draw a neat labelled diagram.**

Sycon

### **SOLUTION**

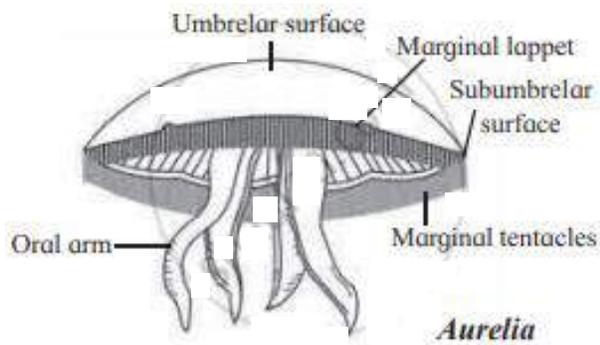


### **Exercise | Q 3. (B) | Page 42**

**Draw a neat labelled diagram.**

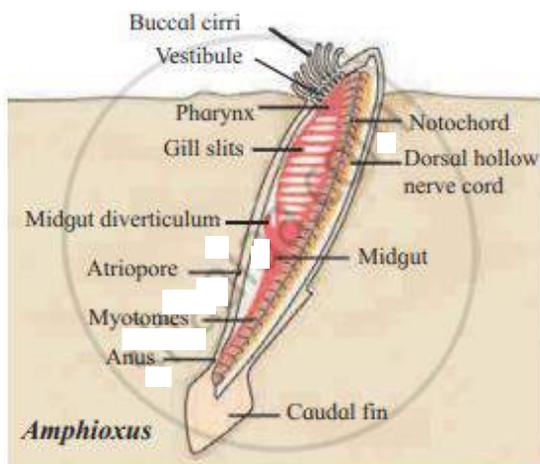
Aurelia

**SOLUTION**



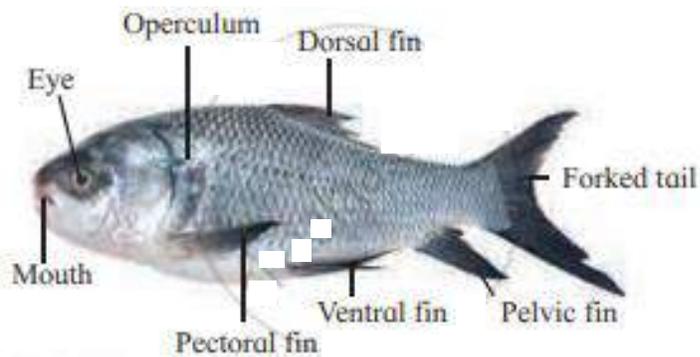
**Exercise | Q 3. (C) | Page 42**  
**Draw a neat labelled diagram.**  
Amphioxus

**SOLUTION**



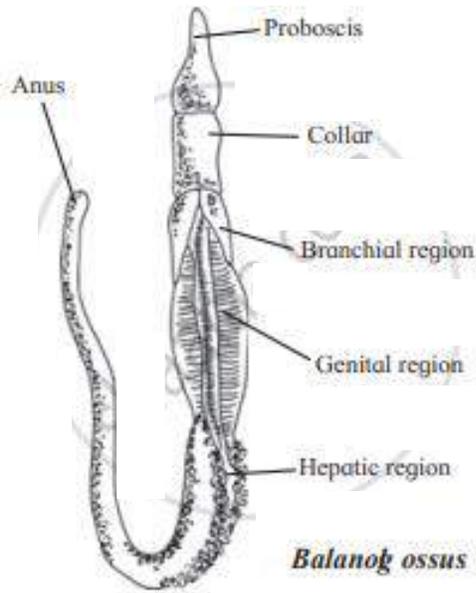
**Exercise | Q 3. (D) | Page 42**  
**Draw a neat labelled diagram.**  
Catla

**SOLUTION**



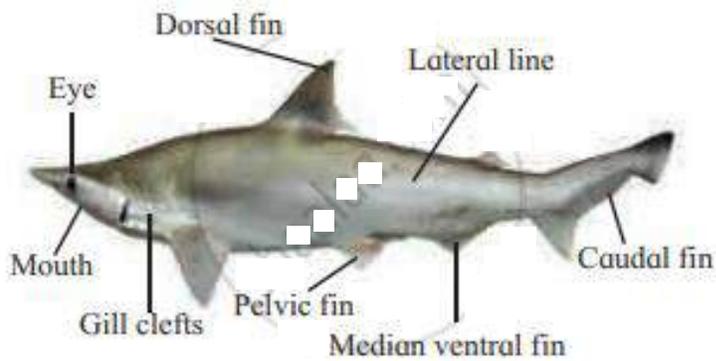
**Exercise | Q 3. (E) | Page 42**  
**Draw a neat labelled diagram.**  
 Balanoglossus

**SOLUTION**



**Exercise | Q 3. (F) | Page 42**  
**Draw a neat labelled diagram.**  
 Scolidon

**SOLUTION**



**Exercise | Q 4 | Page 42**  
**Match the following.**

Phylum	Characters
i. Annelida	a. Tube feet

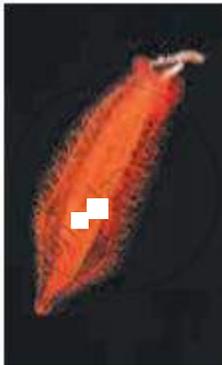
ii. Mollusca	b. Ostia
iii. Ctenophora	c. Radula
iv. Porifera	d. Parapodia
v. Echinodermata	e. Comb plates

**SOLUTION**

Phylum	Characters
i. Annelida	d. Parapodia
ii. Mollusca	c. Radula
iii. Ctenophora	e. Comb plates
iv. Porifera	b. Ostia
v. Echinodermata	a. Tube feet

**Exercise | Q 5. (A) | Page 43**

Identify the animal given in the picture and write features of its phylum/class.



**SOLUTION**

The organism in the given picture is Comb jelly (Red midwater Comb jelly) and it belongs to phylum Ctenophora.

**Features of phylum Ctenophora:**

1. **Habitat:** They are exclusively marine.
2. **Forms:** They are free-swimming animals.
3. **Germ layers:** Members of this phylum are diploblastic.
4. **Body Symmetry:** They are radially symmetrical.

5. **Body plan:** The animals of this phylum show a blind-sac body plan.
6. **Body organization:** They show the tissue-level organization.
7. **Locomotion:** It is carried out by eight rows of ciliated comb plates.
8. **Bioluminescence:** It is the characteristic feature of the members of this phylum.
9. **Digestion:** It is extracellular and intracellular.
10. **Reproduction:** Reproduction is sexual with indirect development.
11. **Colloblasts:** These sticky cells are used to capture prey.  
e.g. Pleurobrachia, Ctenoplana

**Exercise | Q 5. (B) | Page 43**

Identify the animal given in the picture and write features of its phylum/class.



**SOLUTION**

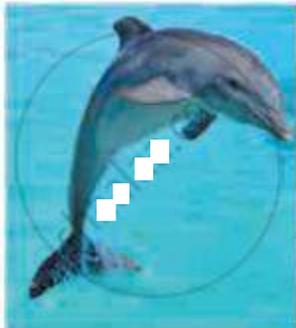
The organism in the given picture is Eel and it belongs to the phylum Chordata.

**Features of phylum Chordata:**

1. Notochord present at least in early embryonic life.
2. Nerve cord is single, dorsal and non-ganglionated.
3. The heart is ventral in position.
4. Pharyngeal gill slits are present at least in the embryonic stage.
5. Post-anal tail is present at least in the embryonic stage.

**Exercise | Q 5. (C) | Page 43**

Identify the animal given in the picture and write features of its phylum/class.



## **SOLUTION**

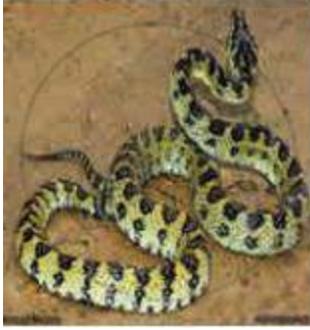
The given organism in the given picture is Dolphin and it belongs to class Mammalia.

### **Features of class Mammalia:**

1. **Special feature:** Presence of mammary glands (milk-producing glands) for the nourishment of young ones. Mammary glands are modified sweat glands.
2. **Habitat:** Mammals are omnipresent (present everywhere). These are mostly terrestrial, some are aquatic and a few are aerial and arboreal (living on trees).
3. **Locomotion:** Limbs are the organs of locomotion and are modified for walking, climbing, burrowing, swimming, etc.
4. **Body division:** Body is differentiated into head, neck, trunk, and tail. They have an external ear (pinna).
5. **Body temperature:** Mammals are homeotherms or warm-blooded animals.
6. **Exoskeleton:** It is in the form of hair, fur, nails, hooves, horns, etc.
7. **Skin:** Skin is glandular and has sweat glands and sebaceous (oil) glands.
8. **Mouth cavity:** Mammals show heterodont dentition (various types of teeth like incisors, canines, premolars and molars).
9. **Circulation:** Heart is ventral in position, four chambered with two auricles and two ventricles. RBCs are biconcave and enucleated (except camel). Blood is red in colour.
10. **Respiration:** Respiration takes place by lungs.
11. **Nervous system:** Brain is highly developed. The cerebrum shows a transverse band called the corpus callosum.
12. **Reproduction and development:** Only few mammals are oviparous. e.g. Duck-billed platypus. Some have pouches for the development of immature young ones. These are called marsupials. e.g. Kangaroo. Most of the mammals are placental and viviparous.

### **Exercise | Q 5. (D) | Page 43**

**Identify the animal given in the picture and write features of its phylum/class.**



### **SOLUTION**

The given organism is Snake and it belongs to class Reptilia.

#### **Features of class Reptilia:**

1. **Habitat:** They are crawling animals. They are the first true terrestrial vertebrates. Few may be aquatic or semi-aquatic and are also found in marshy areas.
2. **Locomotion:** Locomotion occurs by limbs in most animals. The limbs are pentadactyl with clawed digits, which help the animal to walk, creep or crawl. Snakes are limbless and crawl on their belly.
3. **Body temperature:** They are poikilotherms.
4. **Exoskeleton:** Skin is dry, non-glandular and covered by an exoskeleton of epidermal scales or scutes, shields or plates. Lizards and snake shed their skin periodically.
5. **Ear:** Tympanum is present
6. **Circulatory system:** It has two complete auricles but the ventricles are incompletely partitioned. Therefore, the heart of reptiles is not perfectly four-chambered (except in crocodile the heart is four-chambered).
7. **Nervous system:** The brain is well developed. The olfactory lobes and cerebellum are better developed as compared to amphibians.
8. **Reproduction:** Sexes are separate and exhibit prominent sexual dimorphism. Fertilization is internal and the animals are oviparous (exception - viper, it is viviparous). They show little parental care. e.g. Naja naja (Cobra), Hemidactylus (Wall lizard), Chelonia (Turtle), Crocodilus (Crocodile), Testudo (Tortoise), Chameleon (Tree lizard), Bangarus (Krait), Vipera (Viper).

#### **Exercise | Q 5. (E) | Page 43**

**Identify the animal given in the picture and write features of its phylum/class.**



### **SOLUTION**

The given organism is Sea urchin and belongs to the phylum Echinodermata.

#### **Features of Phylum Echinodermata:**

1. **Habitat:** These are exclusively marine.
2. **Forms:** Members of this phylum are solitary, sedentary or free-living and gregarious, benthic.
3. **Body symmetry:** These animals are radially symmetrical with pentamerous symmetry.
4. **Shape:** Members of Echinodermata are spherical, elongated or star-shaped.
5. **Body:** The endoskeleton is made up of calcareous ossicles. Spines are formed on the body. Hence, they are known as echinoderms. The body has two sides oral and aboral and lacks definite divisions. Mouth is ventrally present on oral surface and anus on the aboral surface.
6. **Water vascular system:** The presence of a water vascular system is the peculiar character of echinoderms. The madreporite is the opening of the water vascular system through which water enters. The water vascular system is useful in locomotion, food capturing, respiration.
7. **Digestion:** Digestive system is complete.
8. **Respiration:** Peristomial gills, papillae, respiratory tree, etc. are used for respiration.
9. **Circulatory and excretory systems:** Absent in echinoderms.
10. **Nervous system:** Nervous system is simple with a nerve ring around the mouth and radial nerves in the arms.
11. **Reproduction and development:** Sexes are separate (sometimes bisexual). Fertilization is external. Development is indirect, i.e. through larval stages. They show high power of regeneration.  
e.g. Sea lily (Antedon), Sea star (Asterias), Sea cucumber (Cucumaria), Brittle star (Ophiothrix), Sea urchin (Echinus).

#### **Exercise | Q 5. (F) | Page 43**

**Identify the animal given in the picture and write features of its phylum/class.**



### **SOLUTION**

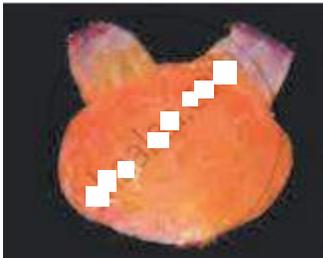
The given organism is a flying lizard and belongs to class Reptilia.

#### **Features of class Reptilia:**

1. **Habitat:** They are crawling animals. They are the first true terrestrial vertebrates. Few may be aquatic or semi-aquatic and are also found in marshy areas.
2. **Locomotion:** Locomotion occurs by limbs in most animals. The limbs are pentadactyl with clawed digits, which help the animal to walk, creep or crawl. Snakes are limbless and crawl on their belly.
3. **Body temperature:** They are poikilotherms.
4. **Exoskeleton:** Skin is dry, non-glandular and covered by an exoskeleton of epidermal scales or scutes, shields or plates. Lizards and snake shed their skin periodically.
5. **Ear:** Tympanum is present
6. **Circulatory system:** It has two complete auricles but the ventricles are incompletely partitioned. Therefore, the heart of reptiles is not perfectly four-chambered (except in crocodile the heart is four-chambered).
7. **Nervous system:** The brain is well developed. The olfactory lobes and cerebellum are better developed as compared to amphibians.
8. **Reproduction:** Sexes are separate and exhibit prominent sexual dimorphism. Fertilization is internal and the animals are oviparous (exception - viper, it is viviparous). They show little parental care.  
e.g. Naja naja (Cobra), Hemidactylus (Wall lizard), Chelonia (Turtle), Crocodilus (Crocodile), Testudo (Tortoise), Chameleon (Tree lizard), Bangarus (Krait), Vipera (Viper).

#### **Exercise | Q 5. (G) | Page 43**

**Identify the animal given in the picture and write features of its phylum/class.**



## SOLUTION

The organism is Herdmania and belongs to Phylum Chordata (Subphylum Urochordata).

### Features of Phylum Chordata (Subphylum Urochordata):

1. It is called a chordate as it shows the following features:
  - a. Presence of notochord at least in early embryonic life. (In Herdmania, the notochord is present in the tail of the larval forms).
  - b. Presence of hollow, dorsal nerve chord, running throughout the length of the body.
  - c. Presence of pharyngeal gill slits.
  - d. Presence of post-anal tail.
2. **Habitat:** They are exclusively marine.
3. **Body covering:** Soft body is covered by 'test' or 'tunic' which is made up of tunicate.
4. **Notochord:** Notochord is present only in the tail of the larva and is lost during metamorphosis. Hence, the name Urochordata.
5. **Respiration:** Pharynx with many gill slits for respiration.
6. **Circulation:** Closed circulatory system is present.
7. **Reproduction:** Development is indirect. e.g. Herdmania, Salpa, Doliolum, Ascidia.

### Exercise | Q 5. (H) | Page 43

Identify the animal given in the picture and write features of its phylum/class.



## SOLUTION

The organism in the given picture is Nautilus and it belongs to phylum Mollusca.

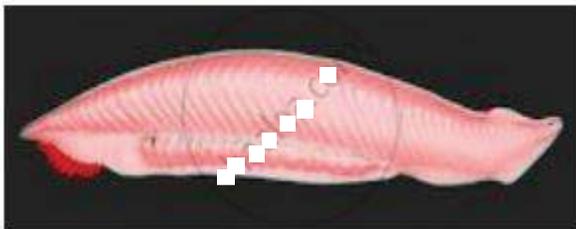
### Features of phylum Mollusca:

1. **Habitat:** They are aquatic or seen in marshy places. Few of them are terrestrial.
2. **Forms:** Molluscs are either free-living or sedentary.
3. **Body plan:** These are soft-bodied and show tube within a tube type of body plan.
4. **Body symmetry:** Most of the Molluscs show bilateral symmetry but few are asymmetrical due to torsion (twisting).

5. **Body division:** Body consists of head, foot and the visceral mass. Visceral mass is enclosed in a thick, muscular fold of body wall called a mantle. Mantle secretes a hard-calcareous shell, that may be external or internal or absent. Muscular foot is present ventrally.
6. **Digestive system:** Digestive system is well-developed and complete with anterior mouth and posterior anus. Buccal cavity has a rasping organ called radula (helps in feeding), which is provided with transverse rows of teeth.
7. **Respiration:** In aquatic forms, numerous feather-like gills called ctenidia, help in aquatic respiration. Terrestrial forms may show the presence of lungs.
8. **Circulatory system:** Circulatory system is of open type (except in Sepia, where it is of the closed type). Blood contains a copper-containing blue coloured respiratory pigment called haemocyanin.
9. **Excretion:** Excretion occurs by kidney like structures, also called 'Organ of Bojanus'.
10. **Nervous system and sense organs:** Nervous system has three pairs of ganglia. All these ganglia are interconnected by commissures and connectives.
11. **Sense organs:** Sense organs such as eyes for vision, tentacles for tactile sensation and osphradia for testing purity of water is present.
12. **Sexual reproduction:** Sexes are usually separate. Animals of this phylum are mostly oviparous and the development is direct or indirect.  
e.g. Pila, Spisula (Bivalve), Octopus (devilfish), Sepia (cuttle fish), Chaetopleura (Chiton), Pinctada (Pearl oyster), Loligo (Squid), Aplysia (Sea hare), Dentalium (Tusk shell).

### Exercise | Q 5. (I) | Page 43

Identify the animal given in the picture and write features of its phylum/class.



### SOLUTION

The organism in the given picture is Amphioxus and it belongs to Phylum Chordata (Subphylum Cephalochordata).

### Features of Phylum Chordata (Subphylum Cephalochordata):

1. Notochord present at least in early embryonic life.
2. Nerve cord is single, dorsal and non-ganglionated.
3. The heart is ventral in position.
4. Pharyngeal gill slits are present at least in the embryonic stage.

5. The post-anal tail is present at least in the embryonic stage.

**Exercise | Q 6 | Page 43**

**Observe and identify the body symmetry of a given animal.**

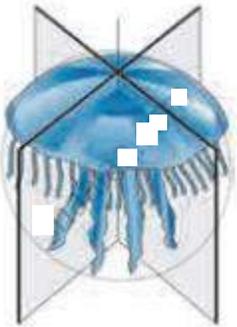


**SOLUTION**

represents asymmetry

**Exercise | Q 6 | Page 43**

**Observe and identify the body symmetry of a given animal.**



**SOLUTION**

represents radial symmetry.

**Exercise | Q 6 | Page 43**

**Observe and identify the body symmetry of a given animal.**



**SOLUTION**

represents bilateral symmetry.