CHAPTER › 04

Animal Kingdom

NEET KEY NOTES

- Animals are multicellular, heterotrophic, eukaryotes who exhibit different patterns of organisation of several types of cells.

Basis of Classification

The fundamental features common to various individuals that are used as the basis of animal classification have been given below

- **Levels of Organisation** Though all the members of kingdom–Animalia are multicellular, yet all of them do not exhibit the same pattern of cellular organisation. Different levels of organisation are discussed below
  - **Cellular level** (cell aggregates) found in sponges.
  - **Tissue level** (cell performing same function are arranged into tissues) found in coelenterates and ctenophores.
  - **Organ level** (tissues grouped together to form organs) found in phylum–Platyhelminthes and other higher phyla.
  - **Organ system level** (association of organs to form functional systems) found in annelids to chordates.
- **Symmetry** On the basis of symmetry, animals can be **asymmetrical**, i.e. body cannot be divided into equal halves by any plane (e.g. sponges), **radially symmetrical**, i.e. body can be divided into equal halves by any plane passing through the central axis (e.g. coelenterates, ctenophores and echinoderms) and **bilaterally symmetrical**, i.e. body can be divided into two identical halves (left and right) only along one plane (e.g. annelids and arthropods).
- **Diploblastic and Triploblastic Organisation** On the basis of germ layers, animals are classified as **Diploblastic** (cells arranged in two embryonic layers, i.e. external **ectoderm** and internal **endoderm**), e.g. coelenterates and **triploblastic** (cells arranged in three germ layers, i.e. ectoderm and endoderm and an undifferentiated layer **mesoderm** between them), e.g. phylum–Platyhelminthes to Chordata.
- **Coelom** It is the body cavity (present between body wall and gut wall), which is lined by mesoderm. Animals are also classified on the basis of the presence or absence of coelom as given below
  - **Coelomates** Animals which possess coelom. They are further classified into schizocoelomates (e.g. annelids, molluscs and arthropods) and enterocoelomates (e.g. echinoderms and chordates).
  - **Acoelomates** The animal in which body cavity is absent are called acoelomates, e.g. Porifera to Platyhelminthes (true acoelomates).
  - **Pseudocoelomates** Mesoderm does not line the body cavity and is present between ectoderm and endoderm as scattered pouches, e.g. Aschelminthes.
- **Segmentation** In some animals, the body is externally and internally divided into segments or somites with a serial repetition of at least some organs. In earthworm, this phenomenon is known as **metamerism**.
- **Notochord** It is a mesodermally derived rod-like structure formed on the dorsal side during embryonic development in some animals. Animals with notochord are called **chordates** and without notochord are **non-chordates**, e.g. Porifera to Echinodermata.

Classification of Animals

Broadly kingdom–Animalia is classified as follows

I. Non-chordates

The non-chordates include the following phyla

1. **Phylum–Porifera** includes sponges, which are usually marine and mostly asymmetrical animals with canal system as most important features.
   - Central cavity present in sponges is known as **spongocoel**, it is lined by collar cells or **choanocytes** and it opens to outside by osculum.
   - Water enters the spongocoel through minute pores called **ostia** and moves out through osculum.
   - The body is supported by **spicules** or **spongin** and protein fibres, which form skeletal system.
   - They are **hermaphrodites**, i.e. both male and female gametes are produced within same individual. Fertilisation is internal and development is indirect.
   - Sponges reproduce asexually by fragmentation and sexually by gamete formation. Larval forms are morphologically distinct form adults, e.g. *Sycon*, *Spongilla* and *Euspongia*.
2. **Phylum–Cnidaria** (Coelenterata) consists of aquatic marine, sessile, radially symmetrical animals.
   - Tentacles are either present over the mouth or around their body edges. Cells called **cnidoblasts** or **cnidocytes** are present on the tentacles and the body. These cells are used for anchorage, defence and capture of prey.
   - A central gastrovascular cavity (coelenteron) with a single opening, mouth on **hypostome** is present.
   - Some cnidarians, e.g. **corals**, have skeleton composed of $CaCO_3$.
   - They show polymorphism with two basic body plans, i.e. **polyps** are fixed, sessile, cylindrical, e.g. *Hydra*, *Adamsia,* etc., and **medusae** are umbrella-shaped and free-swimming, e.g. *Aurelia*.
   - The cnidarians exist in both forms and exhibit alternation of generation (metagenesis), i.e. polyps produce medusae asexually and medusae produce polyps sexually (e.g. *Obelia*).
3. **Phylum–Ctenophora** (Comb jellies or Sea walnuts)
   - These are exclusively marine, diploblastic, radially symmetrical, acoelomate organisms with tissue level of organisation.
   - Body is soft, transparent and gelatinous with well-marked **bioluminescence** (the property of a living organism to emit light).
   - Eight external rows or ciliated **comb plates** help in locomotion.
   - Digestion is both extracellular and intracellular.
   - These are sexually reproducing, monoecious organisms with external fertilisation and indirect development, e.g. *Ctenophora* and *Pleurobrachia*.
4. **Phylum–Platyhelminthes** (Flatworms)
   - These are dorsoventrally flattened, bilaterally symmetrical, triploblastic and acoelomate animals. They are mostly endoparasites and show organ system level of organisation.
   - They have specialised cells for excretion and osmoregulation called **flame cells**.
   - They possess a high regeneration capacity. Fertilisation is internal and development is through many larval stages, e.g. *Planaria*, *Taenia* (tapeworm) and *Fasciola* (liver fluke).
5. **Phylum–Aschelminthes** (Roundworms)
   - They are bilaterally symmetrical, triploblastic and pseudocoelomate animals with the body being circular in cross-section.
   - They are free-living, aquatic, terrestrial or parasitic forms.
   - They are **dioecious** (separate sexes) and show internal fertilisation with indirect development. Females are often longer than males.
   - Alimentary canal is complete with a well-developed **muscular pharynx**.
   - Excretion is through excretory pore. Fertilisation is internal and development may be direct or indirect. e.g. *Ascaris* (roundworm), *Wuchereria* (filaria worm) and *Ancylostoma* (hookworm).
6. **Phylum–Annelida** (Segmented worms)
   - They are triploblastic show organ level of body organisation and are bilaterally symmetrical.
   - They show metameric segmentation, i.e. body surface is distinctly marked out into **segments** or **metameres**.
   - Locomotion is aided by longitudinal and circular muscles. In *Nereis*, swimming is achieved by lateral appendages called **parapodia**.
   - Respiration is through skin or gills, circulatory system is closed and digestive system is complete.
   - Excretion is through **nephridia**. Both monoecious, e.g. *Nereis* and dioecious forms, e.g. *Pheretima* (earthworm) and *Hirudinaria* (leech) occur.
   - Neural system consists of paired ganglia connected by lateral nerve to a double ventral nerve cord.
   - They reproduce sexually.

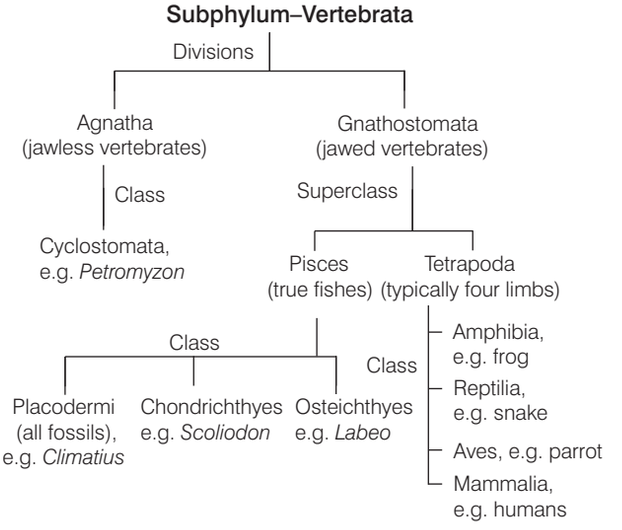
7. **Phylum–Arthropoda Largest phylum** of kingdom–Animalia, includes insects.
   - They are triploblastic, segmented, bilaterally symmetrical coelomate animals. Body is covered by chitinous exoskeleton.
   - Body consists of **head**, **thorax** and **abdomen**.
   - They possess **jointed appendages**.
   - Circulatory system is open type, forming a haemocoel.
   - Sensory organs like antennae, eyes, statocysts or balancing organs are present.
   - Respiratory system shows diverse range, e.g. gills, trachea, book lungs, general body surface and book gills, e.g. *Apis*, *Culex*, *Limulus* (a living fossil), etc.
   - Excretion takes place through **Malpighian tubules**.
   - Fertilisation is internal with direct or indirect development. Mostly dioecious.
8. **Phylum–Mollusca** It is the **second largest** phylum.
   - These are terrestrial or aquatic, mostly marine and some are freshwater.
   - These are bilaterally symmetrical, triploblastic and coelomate animals.
   - Body is unsegmented and covered by a calcareous shell but consists of a distinct **head**, **muscular foot** and **visceral hump**. The space between hump and mantle is called **mantle cavity** in which feather like gills are present.
   - They have respiratory and excretory functions. The anterior head region has sensory tentacles.
   - Feeding is performed through **radula**. Circulation is open type, excretion through organ of Bojanus or metanephridia pair.
   - Sexes are separate and are mostly oviparous, e.g. *Octopus*, *Pila*, *Sepia*.
   - They are usually dioecious and oviparous with indirect development.
9. **Phylum–Echinodermata** have an endoskeleton of calcareous ossicles.
   - They are radially (pentamerous) symmetrical at adult stage and bilaterally symmetrical at larval stage.
   - They are triploblastic and coelomate animals.
   - **Water vascular system** is present, which helps in locomotion, capture and transport of food and respiration.
   - Complete digestive system is present and an excretory system is absent.
   - Sexes are separate and reproduction is sexual with indirect development and free-swimming larvae, e.g. *Asterias* (starfish), *Echinus* (sea urchin), *Cucumaria* (sea cucumber).
10. **Phylum–Hemichordata** (Half chordates)
    - These are bilaterally symmetrical, tripoblastic and coelomate worm-like marine animals.
    - Body is cylindrical and divided into **proboscis**, **collar** and **trunk**. Notochord is absent.
    - Excretion occurs through proboscis gland, circulation is open type and respiration occurs through gill slit pairs.
    - Sexes are separate, fertilisation is external and development is indirect.
    - Connecting link between echinoderms and chordates, e.g. *Balanoglossus,* etc.

II. Phylum–Chordata

These have **notochord**, **dorsal hollow nerve chord, paired pharyngeal gill slits** and post-anal tail at some stages of life. They are divided into following subphyla

1. **Urochordata** (tunicates) Notochord is present only in larval tail, e.g. *Herdmania*.
2. **Cephalochordata** (lancelets) Notochord persists throughout life and extends from head to tail, e.g. *Branchiostoma*.

   Note Urochordata and Cephalochordata are often referred to as **protochordata**.
3. **Vertebrata** (vertebrates) Notochord replaced by vertebral column in adults.



- **Some Major Classes of Vertebrates** Characteristic features of some major classes of subphylum– Vertebrata are as follows

1. **Class–Cyclostomata**
   - These are ectoparasites on some fishes, have 6-15 pairs of **gill slits**.
   - Sucking and circular mouth without jaws. These possess sucktorial tongue that bears horny teeth.
   - Cranium and vertebral column are cartilaginous.
   - They die after spawing and their larvae return to ocean after metamorphosis, e.g. lamprey, hagfish.
2. **Class–Chondrichthyes**
   - These are cartilaginous fishes.
   - **Notochord** is well-developed and **persists** throughout life.
   - Mouth is on the ventral side and teeth are modified **placoid scales**.
   - Heart two-chambered, ureotelic animals, sexes are separate, males usually have claspers for copulation, e.g. sharks (*Carcharodon* and *Sphyrna*), sting rays (*Trygon*), etc.
   - Some have **electric organs** (e.g. *Torpedo*) and others have **poison sting** (e.g. *Trygon*). They are poikilothermous (cold blooded, i.e. they lack the capacity to regulate their body temperature) animals. Possess uncovered gills and five pairs of gill slits and tough skin containing minute placoid scales.
   - Some are predaceous (e.g. sharks).
   - Sexes are separate and fertilisation is internal. Many are viviparous, e.g. *Carcharodon, Sphyrna,* etc.
3. **Class–Osteichthyes**
   - These are marine as well as freshwater bony fishes.
   - Four pairs of filamentous gills, covered by **operculum** (gill cover) are present. Exoskeleton with **cycloid** or **ctenoid** scales.
   - They contain **air bladder** that regulates buoyancy.
   - Heart is two-chambered and mostly of these are ammonotelic.
   - Sexes are separate and development is direct. Mostly they are oviparous.
   - Fertilisation external, e.g. *Labeo*, *Catla*, *Clarias*, etc.
4. **Class–Amphibia**
   - These are the first terrestrial organisms and can live in both aquatic and terrestrial habitats. These are poikilothermic, ectothermic or cold-blooded.
   - Body is divided into **head** and **trunk**. Tail may be present in some.
   - Heart is three-chambered. These have mesonephric kidneys and mostly are ureotelic.
   - Alimentary canal, urinary and reproductive tracts open into **cloaca**.
   - Respiration occurs by gills, lungs, lining of buccopharyngeal cavity and moist skin, either, separately or in combination.
   - **Tympanum** represents the ear.
   - The eyes have eyelids and inner and middle ears represent the ear. Fertilisation is external. These are oviparous and the development is direct, e.g. *Salamandra, Rana* (Frog).
5. **Class–Reptilia**
   - They show creeping or crawling movements and are mostly terrestrial.
   - They are poikilothermic, exothermal or cold-blooded animals.
   - Body covered by dry epidermal and cornified **scutes** or **scales** and their skin lacks glands.
   - Kidney is metanephric. Crocodiles are ammonotelic, turtles and alligators are ureotelic and lizards and snakes are uricotelic.
   - Bony endoskeleton, well-developed digestive system, respiration through lungs (in turtles through cloaca), heart is three-chambered (except in crocodiles that have four-chambered heart).
   - Sexes are separate and fertilisation is internal. They are oviparous and show direct development, e.g. *Chameleon, Gavialis*.
6. **Class–Aves**
   - These animals are characterised by the presence of **feathers** that act as insulator and help in flight. Body is streamlined.
   - They possess **beak** and forelimbs that are modified into **wings**.
   - They are endothermal and warm-blooded (**homeothermous**) animals.
   - Bony endoskeleton, feathery exoskeleton metanephric kidneys and have pneumatic bones (with air cavities).
   - Digestive tract contains crop and gizzard. Heart is four-chambered and respiration occurs through lungs. These are uricotelic and have a special voice producing organ called syrinx.
   - Sexes are separate. Fertilisation is internal. They are oviparous and show direct development, e.g. crow, pigeon.

7. **Class–Mammalia**
   - These are characterised by the presence of milk producing **mammary glands** and give birth to young ones, i.e. show viviparity.
   - They have two pairs of limbs and are adapted to fly (bat) or live in water (whale) or are terrestrial (horse, camel and human).
   - They are homeothermal and the skin is covered with **hairs** and have external ears or **pinnae**.
   - Body is divisible into head, neck, trunk and tail. The heart is four-chambered and respiration occurs through lungs.
   - Sexes are separate, fertilisation is internal and developmnent is direct, e.g. platypus, kangaroo, camel, etc.

Salient Features of Different Phyla in the Animal Kingdom

Phylum	Level of Body Organisation	Symmetry	Coelom	Distinctive Features			Special Features
				Digestive System	Respiratory System	Circulatory System	
Porifera	Cellular	Asymmetrical	Acoelomate	Absent	Absent	Absent	• Presence of choanocytes. • Presence of water transport or water canal system.
Coelenterata (Cnidaria)	Tissues	Radial	Acoelomate	Incomplete	Absent	Absent	• Presence of cnidoblasts. • Exhibition of two body forms, i.e. polyp and medusa.
Ctenophora	Tissues	Radial	Acoelomate	Incomplete	Absent	Absent	• Presence of comb plates for locomotion. • Bioluminescence.
Platyhelminthes	Organ and organ system	Bilateral	Acoelomate	Incomplete	Absent	Absent	• Dorsoventrally flattened body. • Presence of hooks and suckers.
Aschelminthes	Organ system	Bilateral	Pseudocoelomate	Complete	Absent	Absent	• Body is circular in cross-section.
Annelida	Organ system	Bilateral	Schizocoelomate	Complete	Present	Absent	• Show metamerism. • Presence of nephridia for excretion and osmoregulation.
Arthropoda	Organ system	Bilateral	Schizocoelomate	Complete	Present	Present	• Chitinous exoskeleton • Jointed appendages • Body divided into head, thorax and abdomen. • Presence of Malpighian tubules for excretion.
Mollusca	Organ system	Bilateral	Schizocoelomate	Complete (mouth contains radula for feeding)	Present	Present	• Body covered by calcareous shell. • Body is unsegmented with distinct head, muscular foot and visceral hump.
Echinodermata	Organ system	Radial (pentamerous)	Enterocoelomate	Complete	Present	Present	• Water vascular system for locomotion, capture and transport of food and respiration.
Hemichordata	Organ system	Bilateral	Enterocoelomate	Complete	Present	Present	• Worm like marine organisms. • Body consists of proboscis, collar and trunk.
Chordata	Organ system	Bilateral	Enterocoelomate	Complete	Present	Present	• Presence of notochord, dorsal hollow nerve chord and paired pharyngeal gill slits.

Mastering NCERT

MULTIPLE CHOICE QUESTIONS

TOPIC 1 *Basis of Classification*

1 Cellular level of organisation is
(a) seen in sponges
(b) when cells shows division of labour
(c) when cells are arranged in loose cell aggregates
(d) All of the above

2 In tissue level of organisation the
(a) cells are arranged as loose cell aggregates
(b) tissues are grouped to form organs
(c) cells performing the same function are arranged into groups
(d) tissues are grouped to form systems

3 Organ system level of organisation is observed in
(a) chordates (b) annelids
(c) molluscs (d) All of these

4 Choose the incorrect option.

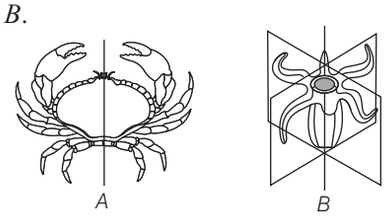
(a)	Complete digestive system	–	Two openings, mouth and anus
(b)	Incomplete digestive system	–	Single opening
(c)	Open circulatory system	–	Blood is circulated through tube system
(d)	Closed circulatory system	–	Arteries, veins and capillaries are present

5 Phylum(s) that exhibit radial or radial-like symmetry is/are
(a) Coelenterata (b) Echinodermata
(c) Ctenophora (d) All of these

6 The term 'bilateral symmetry' refers
(a) when the body can be divided into two unequal halves on passing central axis through it
(b) to any plane passing through centre, which does not divide the body into equal halves
(c) when the body can be divided into identical left and right halves only in one plane
(d) any plane passing through the central axis of the body dividing the organism into two equal halves

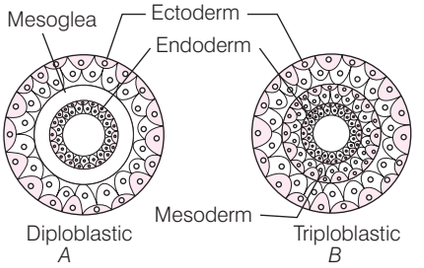
7 The response to external stimulus is maximally quicker and more precise in which of the following symmetry?
(a) Radial (b) Bilateral
(c) Spherical (d) Biradial

8 Choose the correct type of symmetry for the animals, *A* and *B*.



(a) Bilateral, Asymmetrical, respectively
(b) Bilateral, Radial, respectively
(c) Radial, Bilateral, respectively
(d) Radial, Radial, respectively

9 The diagram below shows the diploblastic and triploblastic germ layers in the animals. Identify the correct option in which they are found.



(a) A–Molluscs, B–Chordates
(b) A–Annelida, B–Porifera
(c) A–Coelenterates, B–Platyhelminthes
(d) A–Porifera, B–Cnidaria

10 Diploblastic animals belong to the phylum
(a) Protista (b) Protozoa
(c) Ctenophora (d) Platyhelminthes

11 Higher phylum like echinoderms include
(a) triploblastic animals
(b) quadroblastic animals
(c) diploblastic animals
(d) uniblastic animals

12 Differentiated embryonic layers are called
I. ectoderm II. endoderm
III. mesoderm IV. mesoglea
(a) I, II and IV (b) I, II and III
(c) II, III and IV (d) I, III and IV

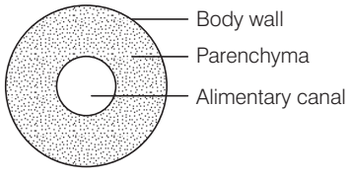
13 A coelom is a
(a) cavity between body wall and gut wall
(b) body cavity lined by mesoderm
(c) body cavity not lined by mesoderm
(d) body cavity lined by endoderm

14 Which one of the following diagram shows coelomate condition?

(a) A (b) B
(c) C (d) None of these

15 The pseudocoelomate animals are included in the plylum
(a) Porifera (b) Annelida
(c) Aschelminthes (d) Mollusca

16 The cross-section of the body of an invertebrate is given below. Identify the animal, which has this body plan.



(a) Cockroach (b) Roundworm
(c) *Planaria* (d) Earthworm

17 True segmentation is also called
(a) metagenesis (b) metamorphosis
(c) metamerism (d) metastasis

18 The notochord is derived from which of the following layers?
(a) Ectoderm (b) Mesoderm
(c) Endoderm (d) Placoderm

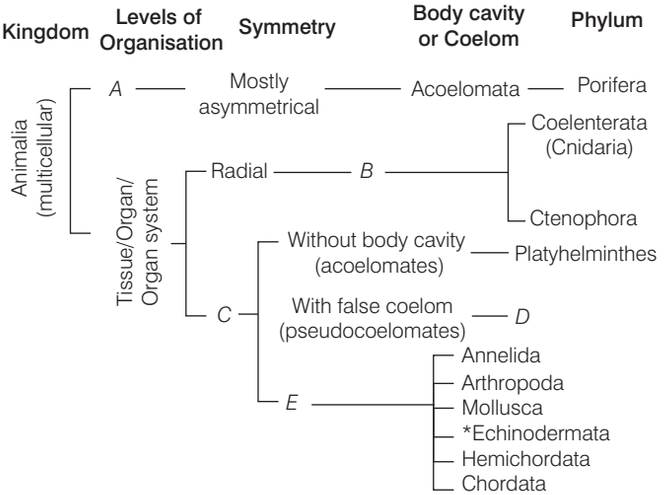
19 Which of the following is/are correct?
(a) Notochord is ectodermal in origin present in some animals
(b) Notochord is a mesodermally derived rod-like structure formed on the dorsal side during embryonic development in some animals
(c) Arthropods are non-chordates
(d) Both (b) and (c)

20 Tube-within-tube body plan is found in which animal?
(a) *Euspongia* (b) *Fasciola*
(c) *Hydra* (d) None of these

21 Fill in the blanks with the correct options.
I. …*A*… have cellular level of organisation.
II. Coelom is not seen in …*B*…..
III. Radial symmetry is seen in phylum–Coelenterata, Ctenophora and …*C*…..
IV. Notochord is lacking in …*D*…
V. …*E*… are bilaterally symmetrical.
Here *A* to *E* refers to
(a) A–Platyhelminthes, B–Echinodermata, C–Arthropoda, D–Mollusca, E–Porifera
(b) A–Porifera, B–Platyhelminthes, C–Echinodermata, D–Mollusca, E–Arthropoda
(c) A–Porifera, B–Echinodermata, C–Mollusca, D–Arthropoda, E–Platyhelminthes
(d) A–Echinodermata, B–Arthropoda, C–Platyhelminthes, D–Mollusca, E–Porifera

22 Choose the false option.
(a) *Amoeba* – Asymmetrical
(b) Coelenterates – Diploblastic, radial symmetry, non-chordates
(c) Chordates – *Petromyzon*, *Ornithorhynchus, Equus*
(d) Annelid – Pseudocoelomate

23 Study the flow chart given below and identify the missing parts *A, B, C, D, E*.



	A	B	C	D	E
(a)	Cellular	Acoelomata	Bilateral	Aschelminthes	Coelomates
(b)	Cellular	Coelomata	Radial	Aves	Pseudocoelomates
(c)	Cellular	Acoelomata	Radial	Mammalia	Pseudocoelomates
(d)	Cellular	Coelomata	Radial	Aschelminthes	Coelomates

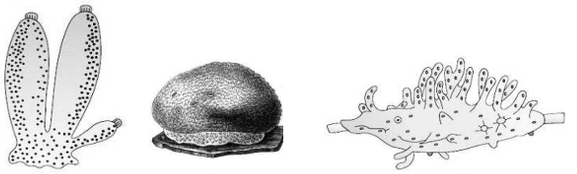
24 Triploblastic, unsegmented, acoelomate exhibiting bilateral symmetry and reproducing both asexually and sexually, with some parasitic forms.
The above description is the characteristic of phylum
(a) Annelida (b) Ctenophora
(c) Cnidaria (d) Platyhelminthes

25 The animal with bilateral symmetry in young stage and radial pentamerous symmetry in the adult stage belongs to the phylum
(a) Annelida
(b) Mollusca
(c) Cnidaria
(d) Echinodermata

26 Which one of the following option is incorrect about the occurrence of notochord?
(a) It is present only in larval tail in ascidian
(b) It is replaced by a vertebral column in adult frog
(c) It is absent throughout life in humans from the very beginning
(d) It is present throughout life in *Amphioxus*

TOPIC 2 ~ *Classification of Animals–Porifera to Aschelminthes*

27 Examine the figures *A, B* and *C*. In which one of the four options all the animals (poriferans) are correct?



(a) A–*Sycon*, B–*Euspongia*, C–*Spongilla*
(b) A–*Euspongia*, B–*Spongilla*, C–*Sycon*
(c) A–*Spongilla*, B–*Sycon*, C–*Euspongia*
(d) A–*Euspongia*, B–*Sycon*, C–*Spongilla*

28 In case of poriferans, the spongocoel is lined with flagellated cells called ***NEET 2017***
(a) ostia
(b) oscula
(c) choanocytes
(d) mesenchymal cells

29 In phylum–Porifera, opening through which water leaves the spongocoel is called
(a) ostia (b) ommatidia
(c) osculum (d) choanocytes

30 The body wall of a common sponge consists of
(a) pinacoderm (b) choanoderm
(c) mesophyll layer (d) All of these

31 In most simple type of canal system of Porifera, water flows through which one of the following ways?
(a) Ostia → Spongocoel → Osculum → Exterior
(b) Spongocoel → Ostia → Osculum → Exterior
(c) Osculum → Spongocoel → Ostia → Exterior
(d) Osculum → Ostia → Spongocoel → Exterior

32 The skeleton of animals belonging to phylum–Porifera are made up of
(a) spicules (b) spiracles
(c) spines (d) spongocytes

33 Asexual reproduction in sponges takes place by
(a) binary fission (b) multiple fission
(c) fragmentation (d) encystment

34 Sponges are
(a) with water canal system
(b) sexually reproducing by formation of gametes
(c) Both (a) and (b)
(d) sessile or free-swimming

35 Body having meshwork of cells, internal cavities lined with food filtering flagellated cells and indirect development are the characteristics of phylum ***CBSE-AIPMT 2015***
(a) Coelenterata (b) Porifera
(c) Mollusca (d) Protozoa

36 Which one of the following is not a poriferan?
(a) *Sycon* (b) *Spirulina*
(c) *Euspongia* (d) *Spongilla*

37 Which of the following is not true regarding phylum–Coelenterata?
(a) They are diploblastic animals
(b) They have cellular level of organisation
(c) They have nematocyte cells present on the tentacles
(d) The gastrovascular opening is called the hypostome

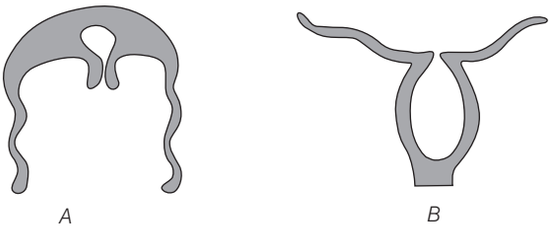
38 Cnidarians are divided into the following classes.
(a) Hydrozoa, Desmospongia and Scyphozoa
(b) Actinozoa, Scyphozoa and Anthozoa
(c) Scyphozoa, Anthozoa and Hydrozoa
(d) None of the above

39 The animal(s) that never perform(s) locomotion voluntarily is/are
(a) *Ascaris* (b) *Leucosolenia*
(c) Both (a) and (b) (d) *Hydra*

40 Body forms present in cnidarians are
(a) cylindrical and umbrella-shaped
(b) corals and coral reefs
(c) polyp and medusa
(d) cnidoblasts and nematocysts

41 Alternation of generations is also called
(a) metamorphosis (b) metastasis
(c) metazoan (d) metagenesis

42 Here two basic body forms of cnidarians are given



(a) A and B are free-swimming forms
(b) A and B are sessile form
(c) A produce B asexually and B form the 'A' sexually
(d) B produce A asexually and A form the 'B' sexually

43 Medusa is the sexually reproductive structure of
(a) *Hydra* (b) *Obelia*
(c) Sea anemone (d) None of these

44 What is the symmetry of medusa? ***JIPMER 2018***
(a) Bilateral (b) Radial
(c) Asymmetrical (d) Biradial

45 Metagenesis is seen in
(a) *Hydra* (b) *Aurelia*
(c) *Obelia* (d) *Adamsia*

46 The skeleton of corals is composed of
(a) siliceous spicules
(b) calcium sulphate
(c) calcium carbonate
(d) potassium sulphate

47 The type of asexual reproduction found in *Hydra* is
(a) multiple fission (b) budding
(c) sporulation (d) binary fission

48 Choose the correct options for the following diagram.
(a) It represents choanocyte in Porifera
(b) It represent cnidoblasts in Platyhelminthes
(c) It represent cnidoblast in Coelenterata
(d) It represent choanocyte in Coelenterata

49 Select the taxon mentioned that represents both marine and freshwater species. ***CBSE-AIPMT 2014***
(a) Echinodermata (b) Ctenophora
(c) Cephalochordata (d) Cnidaria

50 Identifying feature of phylum–Ctenophora is
(a) the presence of comb plates and appearance like jellies
(b) the presence of comb plates only
(c) the presence of tentacles only
(d) alternation of generations only

51 Phylum–Ctenophora shows affinities with
(a) Cnidaria (b) Aschelminthes
(c) Cephalopoda (d) Turbellaria

52 Reproduction in *Ctenoplana* takes place by
(a) budding
(b) sexual reproduction
(c) binary fission
(d) multiple fission

53 Animal of which phylum have hooks and suckers and are endoparasite on other animals? ***AIIMS 2019***
(a) Platyhelminthes (b) Annelida
(c) Aschelminthes (d) Arthropoda

54 Flame cells are present in ***JIPMER 2019***
(a) Aschelminthes (b) Platyhelminthes
(c) Annelida (d) Cephalochordata

55 The cells that help in excretion in *Fasciola* are called
(a) choanocytes (b) nematocysts
(c) nephridia (d) flame cells

56 The level of organisation in Platyhelminthes is
(a) cellular level (b) tissue level
(c) organ level (d) organ system level

57 Which of the following does not belong to phylum–Platyhelminthes?
(a) *Fasciola* (b) *Taenia*
(c) *Ascaris* (d) *Planaria*

58 Which of the following is true about phylum–Platyhelminthes?
(a) Presence of sucking mouth
(b) Mostly free-living in nature
(c) Presence of complete digestive tract
(d) Polyembryony seen in some forms

59 If *Hydra* and *Planaria* are cut transversely in three equal parts, then
(a) all three parts will die
(b) regeneration will occur in all the three parts
(c) regeneration will occur only in anterior part
(d) regeneration occurs only in middle part

60 Trichocyst and nematocyst are meant for
(a) defence (b) nutrition
(c) respiration (d) excretion

61 The first phylum to have a complete alimentary canal is
(a) Platyhelminthes (b) *Ascaris*
(c) Aschelminthes (d) Annelida

62 Aschelminthes are usually
(a) dioecious (b) hermaphrodites
(c) metagenic (d) coelomates

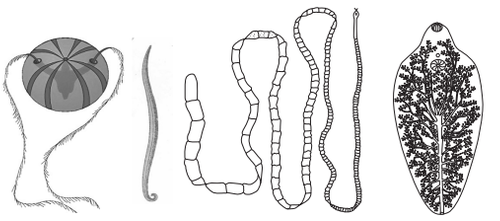
63 Which one of the following endoparasites of humans does show viviparity? ***CBSE-AIPMT 2015***
(a) *Ancylostoma duodenale*
(b) *Enterobius spiralis*
(c) *Trichinella spiralis*
(d) *Ascaris lumbricoides*

64 *Wuchereria bancrofti* is a common filarial worm. It belongs to phylum
(a) Platyhelminthes (b) Aschelminthes
(c) Annelida (d) Coelenterata

65 A triploblastic pseudocoelomate, bilaterally symmetrical human parasite, which is oviparous and the transmission is by contaminated soil. It is
(a) filarial worm (b) hookworm
(c) Palaloworm (d) tapeworm

66 *Ascaris* is characterised by
(a) the absence of true coelom, but presence of metamerism
(b) the presence of neither true coelom nor metamerism
(c) the presence of true coelom, but the absence of metamerism
(d) the presence of true coelom and metamerism

67 Identify the correct option specifying the names of the animals *A, B,C* and *D*.



	A	B	C	D
(a)	*Pleurobrachia*	Tapeworm	*Taenia*	*Aurelia*
(b)	*Fasciola*	Tapeworm	Liver fluke	*Aurelia*
(c)	*Pleurobrachia*	Roundworm	*Taenia*	*Liver fluke*
(d)	*Fasciola*	Roundworm	Liver fluke	*Adamsia*

TOPIC 3 ~ *Classification of Animals–Annelida to Hemichordata*

68 The phylum–Annelida is named so because of
(a) more organs are placed towards anterior part of the body
(b) the presence of antenna
(c) anteriorly placed neural system
(d) the presence of metameres

69 Which of the following animals are true coelomates with bilateral symmetry? ***NEET (Odisha) 2019***
(a) Adult echinoderms (b) Aschelminthes
(c) Platyhelminthes (d) Annelids

70 The animals belonging to phylum–Annelida use the following in locomotion.
(a) Nephridia and nephridial pores
(b) Longitudinal and circular muscles
(c) Organs of bursa
(d) Spicules and ostia

71 Earliest occurrence of metamerism is witnessed in phylum
(a) Platyhelminthes (b) Coelenterata
(c) Arthropoda (d) Annelida

72 Members of phylum–Annelida have
(a) Nephridia – Excretion
(b) Parapodia – Swimming
(c) Double ventral nerve cord – Neural system
(d) All of the above

73 Which of the following groups is formed of only the hermaphrodite organisms?
(a) Earthworm, tapeworm, housefly, frog
(b) Earthworm, tapeworm, sea horse, housefly
(c) Earthworm, leech, sponge, roundworm
(d) Earthworm, tapeworm, leech, sponge

74 Which of the following contain all members of the phylum–Annelida?
(a) *Hirudinaria*, *Nereis* and *Wuchereria*
(b) Earthworms, *Aphrodite* and *Pila*
(c) *Pheretima*, *Tubifex* and *Nereis*
(d) *Aplysia*, *Nereis* and *Dentalium*

75 Bilateral symmetry, metameric segmentation, true coelom and open circulatory system are the features of
(a) Annelida (b) Arthropoda
(c) Mollusca (d) Echinodermata

76 Which one of the following features is not present in the phylum–Arthropoda? ***NEET 2016***
(a) Metameric segmentation (b) Parapodia
(c) Jointed appendages (d) Chitinous exoskeleton

77 Which one of the following characteristics is mainly responsible for diversification of insects on land? ***CBSE-AIPMT 2015***
(a) Segmentation (b) Bilateral symmetry
(c) Exoskeleton (d) Eyes

78 The members of phylum–Arthropoda have balancing organ named as
(a) radula (b) statocysts
(c) choanocyte (d) comb plates

79 Choose the respiratory organs that are present in phylum–Arthropoda.
(a) Tracheal system or Book lungs
(b) Book gills
(c) Gills
(d) All of the above

80 Mark the incorrect option for the phylum–Arthropoda.
(a) Sensory organs like antennae present
(b) Only compound eyes present
(c) Body with head, thorax and abdomen
(d) The presence of Malpighian tubules for excretion

81 Which of the following groups includes only arthropods?
(a) Prawn, *Neopilina* and *Pila*
(b) Cockroach, scorpion and prawn
(c) Chiton, *Neopilina* and scorpion
(d) Chiton, prawn and cockroach

82 Which one of the following animals is called a living fossil?
(a) King locust (b) *Limulus*
(c) *Bombyx* (d) *Balanoglossus*

83 Which one of the following insects is not of any economic benefit?
(a) Silkworm (b) Lac insect
(c) Locust (d) Honeybee

84 The second largest number of species containing phylum after phylum–Arthropoda in the animal kingdom is
(a) Annelida (b) Cnidaria
(c) Mollusca (d) Chordata

85 What is true about Mollusca?
(a) The presence of metameric segmentation
(b) The presence of mantle cavity and coelom cavity
(c) The presence of tissue level of organisation
(d) The presence of chitinous exoskeleton

86 The animal's body belonging to phylum–Mollusca is divided into
(a) head, thorax and abdomen
(b) head, muscular foot and abdomen
(c) head, thorax and visceral hump
(d) head, muscular foot and visceral hump

87 The feeding organ in phylum–Mollusca is
(a) ctenedia (b) undulating membrane
(c) sucker (d) radula

88 Radula is a part of which animal? ***JIPMER 2019***
(a) *Loligo* (b) *Merceneria*
(c) Oyesters (d) *Angopecten*

89 Choose the incorrect option for phylum–Mollusca.
(a) Body is covered by a calcareous shell and unsegmented
(b) Feather-like gills present for excretion and respiration
(c) The anterior head region has sensory tentacles
(d) Mostly terrestrial, triploblastic and acoelomates

90 Which of the following is incorrect match?
(a) *Dentalium* – Tusk shell (b) *Sepia* – Cuttle fish
(c) Chiton – *Pila* (d) *Loligo* – Squid

91 Development of Mollusca is similar to annelids. This can be concluded as both have
(a) larvae named trochophore
(b) direct development without larval stages
(c) larval stage called glochidium only
(d) larval stage called wriggler

92 Most advanced invertebrates are ***JIPMER 2019***
(a) arthropods (b) annelids
(c) molluscs (d) cephalopods

93 Which of the following phyla has no freshwater forms?
(a) Echinodermata (b) Mollusca
(c) Chordata (d) Porifera

94 Excretory organs in echinoderms is
(a) nephridia (b) green glands
(c) flame cells (d) None of these

95 Characteristic feature of phylum–Echinodermata is
(a) radial symmetry (b) water vascular system
(c) mantle cavity (d) All of these

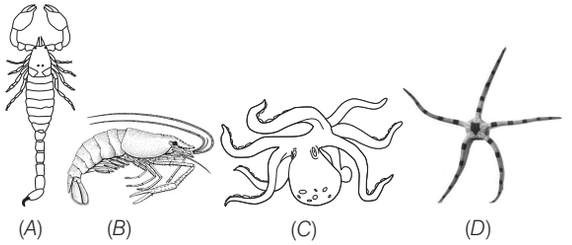
96 Which of the following is/are function(s) of water vascular system in echinoderms?
(a) Locomotion
(b) Respiration
(c) Capture and transport of food
(d) All of the above

97 Scientific name of starfish is
(a) *Echinus* (b) *Limulus* (c) Echidna (d) *Asterias*

98 Choose the animals that belongs to phylum–Echinodermata from the options.
(a) Sea urchin, cuttlefish and sea lily
(b) *Echinus*, sea hare and sea cucumber
(c) *Antedon*, *Ophiura* and *Echinus*
(d) *Ophiura*, *Chaetopleura* and *Echinus*

99 Find the odd one.
(a) Sea lily (*Antedon*) (b) Sea hare (*Aplysia*)
(c) Sea cucumber (*Cucumaria*) (d) Sea urchin (*Echinus*)

100 Choose the correct names for the following.



	A	B	C	D
(a)	Scorpion	Prawn	*Loligo*	*Asterias*
(b)	Scorpion	Prawn	*Octopus*	*Ophiura*
(c)	Locust	Butterfly	*Loligo*	*Asterias*
(d)	Locust	Prawn	Squid	*Ophiura*

101 Which one of the following animals does not undergo metamorphosis? ***NEET 2018***

(a) Moth (b) Tunicate
(c) Earthworm (d) Starfish

102 In which one of the following, the genus name, its two characters and its phylum are not correctly matched, whereas the remaining three are correct? ***CBSE-AIPMT 2012***

Genus Name	Two Characters	Phylum
(a) *Pila*	(i) Body segmented	Mollusca
	(ii) Mouth with radula	
(b) *Asterias*	(i) Spiny skinned	Echinodermata
	(ii) Water vascular system	
(c) *Sycon*	(i) Pore bearing	Porifera
	(ii) Canal system	
(d) *Periplaneta*	(i) Jointed appendages	Arthropoda
	(ii) Chitinous exoskeleton	

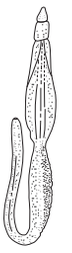
103 An important characteristic that hemichordates share with chordates is ***NEET 2017***

(a) absence of notochord (b) ventral tubular nerve cord
(c) pharynx with gill slits (d) pharynx without gill slits

104 Excretory organ in phylum–Hemichordata is

(a) proboscis gland (b) gills
(c) collar cells (d) None of these

105 The correct classification of given animal is



(a) Chordata – Vertebrata – Craniata
(b) Chordata – Craniata
(c) Chordata – Acraniata
(d) Non-chordata – Hemichordata

106 The body of *Balanoglossus* is divisible into

(a) proboscis, tunic and trunk
(b) collar, trunk and tunic
(c) proboscis, collar and trunk
(d) proboscis, stomochord and trunk

107 Select the feature(s) which is/are present in hemichordates.

(a) Stomochord (b) Worm-like body
(c) Gills (d) All of these

TOPIC 4 ~ *Classification of Animals–Chordata*

108 Which of the following is not found in the phylum–Chordata?

(a) A dorsal hollow nerve cord
(b) Lateral paired gill slits during development
(c) A notochord at some stage of development
(d) An external skeleton

109 All chordates have the following characteristics.

(a) Bilaterally symmetrical, presence of coelom, triploblastic, open circulatory system
(b) Bilaterally symmetrical, presence of coelom, diploblastic or triploblastic
(c) Open circulatory system, diploblastic or triploblastic, coelom and bilaterally symmetrical
(d) Bilaterally symmetrical, coelom present, triploblastic with closed circulatory system

110 Phylum–Chordata is divided into subphyla namely

(a) Vertebrata, Protochordata and Urochordata
(b) Urochordata, Gnathochordata and Vertebrata
(c) Urochordata, Tunicata and Vertebrata
(d) Tunicata, Cephalochordata and Vertebrata

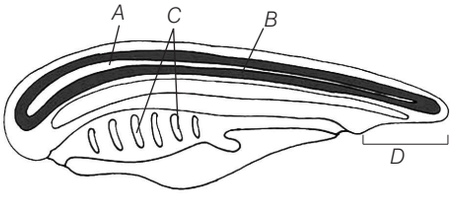
111 The members of which of the following are often referred as protochordates?

(a) Urochordata (b) Cephalochordata
(c) Both (a) and (b) (d) None of these

112 Which animals belong to subphylum–Urochordata?

(a) *Branchiostoma* and *Lancelet*
(b) *Salpa* and *Lancelet*
(c) *Ascidia* and *Doliolum*
(d) *Salpa* and *Amphioxus*

113 Animals belonging to phylum–Chordata are fundamentally characterised by the presence of structure noted as *A, B, C* and *D*. Identify *A, B, C* and *D*.



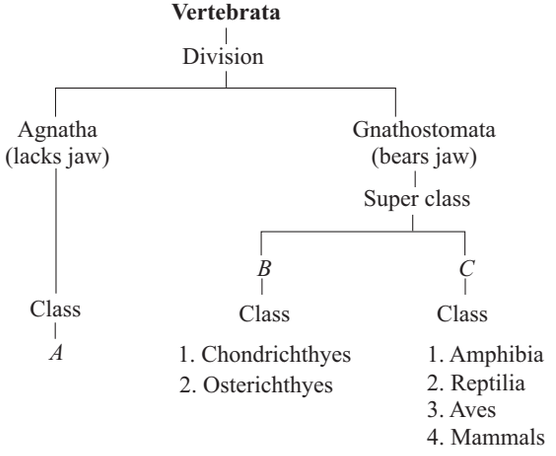
(a) A–Notochord, B–Nerve cord, C–Gill slits, D–Post-anal part
(b) A–Nerve cord, B–Notochord, C–Gill slits, D–Post-anal part
(c) A–Nerve cord, B–Notochord, C–Post-anal part, D–Gill slits
(d) A–Nerve cord, B–Gill slits, C–Notochord, D–Post-anal part

114 Select the correct difference between the notochord in the following.

	Urochordata		Cephalochordata
(a)	Present only in larval tail	–	Extend from head to tail throughout life
(b)	Present only in adult	–	Present only in larval tail
(c)	Persistent throughout their life	–	Present only in adult
(d)	Extend from head to tail throughout life	–	Present only in larval tail

115 Choose the incorrect vertebrate character.
(a) Ventral muscular heart
(b) Kidneys for excretion and osmoregulation
(c) Paired appendages which may be fins or limbs
(d) None of the above

116 The following is the flow chart depicting the divisions of the subphylum–Vertebrata. Fill in the parts *A, B, C* and *D* and choose the correct option.



	A	B	C
(a)	Ostracodermi	Pisces	Tetrapoda
(b)	Cyclostomata	Pisces	Tetrapoda
(c)	Ostracodermi	Cyclostomata	Pisces
(d)	Pisces	Tetrapoda	Cyclostomata

117 Which of the following options about the class–Cyclostomata is incorrect?
(a) Cranium and vertebral column are cartilaginous
(b) Elongated body bearing scales and paired fins
(c) Gill slits for respiration
(d) Sucking and circular mouth

118 *Myxine* (Hagfish) has
(a) 6-15 pairs of gill slits
(b) closed type circulation
(c) jaws
(d) Both (a) and (b)

119 A jawless fish, which lays eggs (spawning) in freshwater and whose ammocoetes larvae after metamorphosis return to the ocean is
CBSE-AIPMT 2015
(a) *Eptatretus* (b) *Myxine*
(c) *Neomyxine* (d) *Petromyzon*

120 Match the name of the animal (Column I) with one characteristic (Column II) and the phylum/class (Column III) to which it belongs. ***NEET 2013***

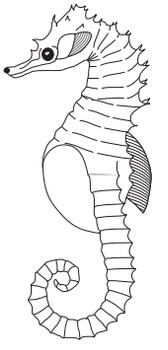
	Column I	Column II	Column III
(a)	*Petromyzon*	Ectoparasite	Cyclostomata
(b)	*Ichthyophis*	Terrestrial	Reptilia
(c)	*Limulus*	Body covered by chitinous exoskeleton	Pisces
(d)	*Adamsia*	Radially symmetrical	Porifera

121 Chondrichthyes is characterised by tooth shaped
(a) placoid scale with dorsal mouth
(b) ctenoid scale with dorsal mouth
(c) ctenoid scale with ventral mouth
(d) placoid scale with ventral mouth

122 Which one is not cartilaginous fish?
(a) *Carcharodon* (Great white shark), *Trygon* (sting ray)
(b) *Exocoetus* (flying fish), *Catla* (katla), *Clarias* (magur)
(c) *Scoliodon* (dog fish)
(d) *Pristis* (saw fish)

123 Which of the following is not a characteristic feature of class–Chondrichthyes?
(a) Gill slits are separate and without operculum
(b) Predaceous with powerful jaws
(c) Notochord is persistent throughout life
(d) Air bladder present

124 Choose the incorrect option for the given figure.



(a) Operculum present (b) Bony fish
(c) Poisonous sting at tail (d) Sexes separate

125 Following are few examples of bony fishes. Choose the odd one out as marine bony fish.
(a) Flying fish
(b) *Hippocampus* (Sea horse)
(c) Both (a) and (b)
(d) *Labeo* (Rohu), *Catla*, *Clarias*

126 Bony fishes
(a) have external fertilisation
(b) are mostly oviparous
(c) show direct development
(d) All of the above

127 Bony fishes can stay at any particular depth in water without spending energy due to
(a) operculum (b) neuromuscles
(c) pneumatic bones (d) swim bladder

128 The number of gills present in Osteichthyes is
(a) 2 pairs (b) 6 pairs
(c) 5 pairs (d) 4 pairs

129 Air bladder occurs in
(a) *Torpedo* (b) *Clarias*
(c) *Scoliodon* (d) *Elasmobranch*

130 Choose the incorrect option for the following animal.

(a) Cloaca present
(b) Dioecious, external fertilisation, oviparous, indirect development
(c) Body divisible into head and trunk
(d) Eyes are without eyelids

131 Which features are common to the animals belonging to class–Amphibia and class–Reptilia?
(a) The presence of scales with internal fertilisation and usually four-chambered heart
(b) The presence of tympanum, poikilotherms and usually three-chambered heart
(c) The presence of cloaca, oviparous and external fertilisation
(d) Skin is moist

132 Reptiles are different from amphibians in
(a) the skin (b) structure of the heart
(c) development stages (d) All of these

133 The presence of which structure is common to frog and snake with respect to respiration?
(a) Diaphragm (b) Skin
(c) Buccal cavity (d) Lungs

134 Dry skin with scales or scutes without gland is a characteristic of
(a) Fishes (b) Reptilia
(c) Amphibia (d) Aves

135 The class name–Reptilia refers to
(a) presence of scales or scutes on their body
(b) presence of dry and cornified skin
(c) their creeping or crawling mode of locomotion
(d) None of the above

136 Syndactyly, prehensile tail and long protrusible tongue are the unique features of
(a) rhesus monkey (b) *Archaeopteryx*
(c) horsefish (d) *Chameleon*

137 In which of the following reptiles four-chambered heart is present?
(a) Lizard (b) Snake
(c) Scorpion (d) Crocodile

138 Which one of the following animals have both exoskeletal and endoskeletal structures?
(a) Freshwater mussel (b) Tortoise
(c) Frog (d) Jellyfish

139 Choose the correct option for the given figures.

(*A*) (*B*)

(a) Animal A is *Salamandra* and B is *Chameleon*
(b) Both A and B belong to class–Reptilia
(c) Fertilisation is external in both
(d) Animal A has 2-chambered heart and B has 3-chambered heart

140 Which one of the following pairs of animals are similar to each other pertaining to the feature stated against them?
(a) *Pteropus* and *Ornithorhynchus* – viviparity
(b) Garden lizard and crocodile – three-chambered heart
(c) *Ascaris* and *Ancylostoma* – metameric segmentation
(d) Sea horse and flying fish – cold-blooded (poikilothermal)

141 Which one of the following is incorrect for Aves?
(a) Heart is four-chambered and animals are oviparous
(b) The presence of air cavities in bones and the presence of feathers on the body
(c) Digestive tract has additional chambers and animals are homeothermous
(d) The forelimbs are not modified into wings

142 Which of the following sets of derivatives of integumentary structures characterise birds, as glorified reptiles?
(a) Scales and claws
(b) Syrinx and uropygial gland
(c) Claws and uropygial gland
(d) Syrinx and scales

143 Which of the following groups of animals shares similarly regarding maintenance of constant body temperature with mammals?
(a) Reptiles (b) Amphibians
(c) Aves (d) Fishes

144 Pneumatic bones are expected to be found in
(a) house lizard
(b) flying fish
(c) pigeon
(d) tadpole of frog

145 Which of the following is/are flightless bird?
(a) Ostrich (b) Emu
(c) Kiwi (d) All of these

146 The character of birds without exception is
(a) deuterostome development
(b) flying wings
(c) beak without teeth
(d) lay eggs with calcareous shell

147 Identify the vertebrate group of animals characterised by crop and gizzard in its digestive system. ***NEET 2018***
(a) Aves
(b) Reptilia
(c) Amphibia
(d) Osteichthyes

148 Phenomenon seen in certain amphibians, but not in mammals is
(a) ability to undergo transformation
(b) ability to change according to season
(c) ability to change colour
(d) ability to stay still for long periods of time

149 Which of the following is a correct sequence of decreasing order of number of species?
(a) Aves, pisces, reptiles, amphibians, mammals
(b) Pisces, aves, reptiles, mammals, amphibians
(c) Pisces, mammals, reptiles amphibians, aves
(d) Amphibians, aves, pisces, mammals, reptiles

150 The unique character of animals belonging to class–Mammalia is
(a) bipedal locomotion
(b) completely four-chambered heart
(c) the presence of mammary glands
(d) fertilisation is internal

151 Which of the following animals is not viviparous? ***CBSE-AIPMT 2015***
(a) Flying fox (bat) (b) Elephant
(c) Platypus (d) Whale

152 Select the correct set of animals of true mammals.
(a) Lion, *Hippopotamus*, penguin, bat
(b) Lion, bat, whale, ostrich
(c) *Hippopotamus*, penguin, whale, *Chelone*
(d) Whale, flying fox, kangaroo, *Hippopotamus*

153 Vivipary is characteristically found in
(a) Coelenterata (b) Protozoa
(c) Rabbit (d) Pisces

154 Which one of the following is an exclusive character of class–Mammalia?
(a) Homeothermy
(b) Internal fertilisation
(c) The presence of a four-chambered heart
(d) The presence of a muscular diaphragm

155 Which one of the following is not a mammalian character without exception?
(a) The presence of milk producing gland
(b) They have two pairs of limbs
(c) Skin is unique in possessing hairs
(d) Heterodont type of dentition

156 Which animals have well-developed echolocation system like that of bats?
(a) Wild cats (b) Beavers only
(c) Primates (d) Dolphins

157 Choose the odd pair amongst the following.
(a) *Ornithorhynchus*–Platypus
(b) *Pteropus*–Flying fox
(c) *Neophron*–Vulture
(d) *Delphinus*–Common dolphin

158 Which one of these animals is not a homeotherm? ***NEET 2018***
(a) *Camelus* (b) *Chelone*
(c) *Macropus* (d) *Psittacula*

159 Which of the following represents order of 'Horse'? ***NEET 2017***
(a) Equidae (b) Perissodactyla
(c) Caballus (d) Ferus

160 Which among these is the correct combination of aquatic mammals?
(a) Seals, Dolphins, Sharks
(b) Dolphins, Seals, *Trygon*
(c) Whales, Dolphins, Seals
(d) *Trygon*, Whales, Seals

NEET

SPECIAL TYPES QUESTIONS

I. Assertion and Reason

■ **Direction** (Q. 161-168) *In each of the following questions, a statement of Assertion (A) is given by corresponding statement of Reason (R). Of the statements, mark the correct answers as*

(a) If both A and R are true and R is the correct explanation of A
(b) If both A and R are true, but R is not the correct explanation of A
(c) If A is true, but R is false
(d) If A is false, but R is true

161 **Assertion** (A) Radial symmetry in animals is advantageous in detecting food and danger.
Reason (R) It allows the animal to be able to respond to stimulus from any direction.

162 **Assertion** (A) Tapeworm, roundworm and pinworm are endoparasites of human intestine.
Reason (R) Contaminated food is the main cause of intestinal infections by Aschelminthes.

163 **Assertion** (A) *Taenia solium* and *Dugesia* belong to Platyhelminthes. ***AIIMS 2018***
Reason (R) Platyhelminthes are coelomates.

164 **Assertion** (A) In many gastropods, the anus and the mantle cavity are placed anteriorly above the head.
Reason (R) During embryonic development in many gastropods, one side of the visceral mass grows faster than the other side. This uneven growth rotates the visceral organs up to 180° in many gastropods.

165 **Assertion** (A) Amphibians cannot survive in sea water.
Reason (R) Amphibians have lungs for breathing on land which would collapse under the water pressure of the sea.

166 **Assertion** (A) Animals that have an exoskeleton, always lack an endoskeleton.
Reason (R) Skeleton cells in the embryonic stage migrate to produce exoskeleton and endoskeleton.

167 **Assertion** (A) Aves must feed more often than reptiles.
Reason (R) Birds are homeotherms and this consumes more energy than reptiles that are poikilotherms.

168 **Assertion** (A) Duck-bill platypus is not a true mammal.
Reason (R) True mammals are all viviparous, while platypus lays eggs.

II. Statement Based Questions

169 Which of the following statements is true?
(a) Phylum–Porifera – Presence of choanocytes and nematocysts
(b) Phylum–Coelenterata – *Meandrina* belongs to this phylum
(c) Phylum–Ctenophora – All exhibit bilateral symmetry only
(d) Phylum–Platyhelminthes – *Wuchereria* belongs to this phylum

170 Which statement is incorrect about *Pleurobrachia*?
(a) They are diploblastic
(b) They have tissue level organisation
(c) They have comb plates
(d) They show asexual and sexual reproduction

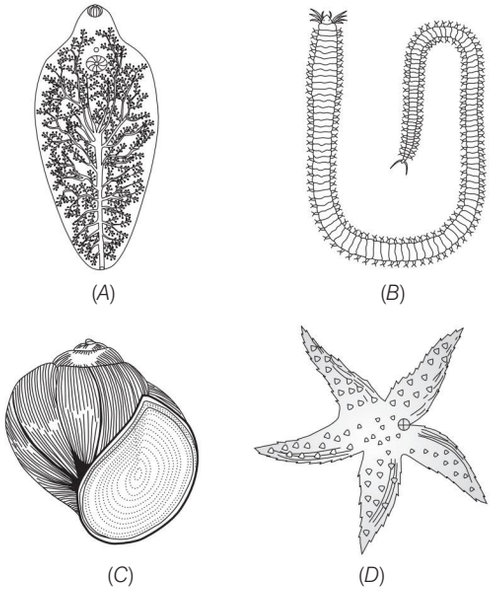
171 Which one of the following statements about certain given animals is correct?
(a) Roundworms are pseudocoelomates
(b) Molluscs are acoelomates
(c) Insects are pseudocoelomates
(d) Flatworms are coelomates

172 Mark the false statement for the phylum–Annelida.
(a) They are bilaterally symmetrical coelomate animals
(b) They have both monoecious and dioecious animal representatives
(c) Excretory system consists of flame cells
(d) They do not show asexual reproduction generally

173 Which of the following statements is false?
(a) Male roundworm is smaller than female
(b) Earthworms are hermaphrodites
(c) Echinoderms are protostomous coelomates
(d) Human teeth are anatomically comparable to scales of shark

174 Which of the following statements represents the incorrect feature of Echinodermata?
(a) They are triploblastic and coelomate animals
(b) All are marine with cellular level of organisation
(c) Endoskeleton of calcareous ossicle
(d) None of the above

175 Choose the correct statement for the following animals.



(a) All these animals are aquatic, free-living
(b) All are true coelomates
(c) 'A' has radial symmetry, but remaining have bilateral symmetry
(d) 'A' is monoecious, but remaining are dioecious

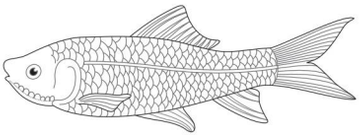
176 Which of the following is/are correct statement(s) for Hemichordata?
(a) They are bilaterally symmetrical, triploblastic and coelomate
(b) Circulation is of open type
(c) Sexes are separate, fertilisation is external and development is indirect
(d) All of the above

177 Choose the correct statement. ***NEET 2016***
(a) All mammals are viviparous
(b) All cyclostomes do not possess jaw and paired fins
(c) All reptiles have a three-chambered heart
(d) All pisces have gills covered by an operculum

178 Which statement is incorrect for animals belonging to the class–Osteichthyes?
(a) The presence of cycloid/ctenoid scales
(b) Both marine and freshwater forms with bony endoskeleton
(c) Mouth terminal and gills covered by operculum
(d) Notochord is persistent only at larval stage, after that it disappears

179 Choose the incorrect statement.
(a) Both cartilaginous and bony fishes are dioecious
(b) Cartilaginous fishes show sexual dimorphism
(c) Male cartilaginous fish have claspers
(d) Female cartilaginous fish have claspers

180 Choose the correct statement for the animals given in the figure below.



(a) Its skin is tough, containing minute placoid scales
(b) It has four pairs of gills which are covered by air bladder
(c) Fertilisation is external and is oviparous
(d) Mouth is located ventrally and jaws are very powerful

181 Which one of the following statement for animals, is correctly described with no exception in it?
(a) All reptiles possess scales, have a three-chambered heart and are cold-blooded (poikilothermal)
(b) All bony fishes have four pairs of gills and an operculum on each side
(c) All sponges are marine and have collared cells
(d) All mammals are viviparous and possess diaphragm for breathing

182 Consider the following features. ***NEET (National) 2019***
A. Organ system level of organisation
B. Bilateral symmetry
C. True coelomates with segmentation of body

Select the correct option of animal groups which possess all the above characteristics.
(a) Annelida, Arthropoda and Mollusca
(b) Arthropoda, Mollusca and Chordata
(c) Annelida, Mollusca and Chordata
(d) Annelida, Arthropoda and Chordata

183 Which of the following statements are true/false?
I. In higher phyla, cellular level of organisation is seen.
II. Phylum–Platyhelminthes have cellular level of organisation.
III. Cellular level of organisation is seen when the cells are not arranged as loose cell aggregates.
IV. Molluscs exhibit tissue level of organisation.

Choose the correct option from the following.
(a) I and II are true, but III and IV are false
(b) All statements are false
(c) All statements are true
(d) III and IV are true, but I and II are false

184 Which of the following statements are true/false?
I. Cell aggregate body plan is found in phylum–Platyhelminthes.
II. Radial symmetry is the most common symmetry found in animals.
III. Pseudocoelom is found only in phylum–Aschelminthes.
IV. All triploblastic animals have a true coelom.

V. Haemocoel is sometimes observed in animals belong to phylum–Platyhelminthes.

(a) I and V are true and II, III and IV are false
(b) II, III and V are true and I and IV are false
(c) I, II and III are true and IV and V are false
(d) I, II, IV and V are false, Only III is true

185 Some of the statements are given below.

I. Porifera to Echinodermata lack a notochord.
II. Platyhelminthes display tissue level organisation.
III. Mesoglea is present in coelenterates during development.
IV. Aschelminthes are coelomates (pseudocoelomates).

Choose the option containing the correct statements.

(a) I, II, III and IV (b) I and II
(c) I, III and IV (d) II and III

186 Which of the following is not a characteristic of phylum–Porifera?

I. Developoment is indirect (larval stage is present).
II. Mostly asymmetrical and usually marine.
III. Primitive multicellular animals with cellular level of organisation.
IV. Choanocytes lines the spongocoel and the canals.
V. Sexes are separate.

(a) I and IV (b) Only II (c) Only V (d) III and IV

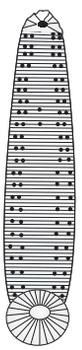
187 Which of the option is correct for the statements given below?

I. Commonly called sea walnuts or comb jellies.
II. Bioluminescence is well-marked.
III. Body bear eight external rows of ciliated comb plates.
IV. Have flame cells for osmoregulation and excretion.
V. Alimentary canal is complete with a well-developed muscular pharynx.

	Ctenophores	Platyhelminthes	Aschelminthes
(a)	I, II, III	IV	V
(b)	IV	I, II	III, V
(c)	I, II	III, IV	V
(d)	IV, V	II, III	I

188 Consider the following statements.

I. Triploblastic, bilateral symmetry.
II. Metamerically segmented and coelomate animals.
III. Dioecious
IV. Closed circulatory system.
V. Lateral appendages.
VI. Annelida



Which of the following information belongs to the given figure?

(a) I, II, IV and VI (b) I, III, IV and V
(c) I, III, IV and V (d) III, IV, V and VI

189 Choose the correct statement for starfish.

I. Sexes are separate and reproduction is sexual.
II. Development is indirect with free-swimming larva.
III. Mouth is present on the upper (dorsal) side and anus on the lower (ventral) side.
IV. Their body bears jaw-like structure which are called oral arms.

(a) I and III (b) I, II and IV
(c) I, II and III (d) III and IV

190 Choose the correct option for *Wuchereria*?

I. Triploblastic with the presence of an excretory pore.
II. The presence of a muscular pharynx.
III. Males longer than females.
IV. Cellular level of organisation.

(a) II and III (b) I and IV
(c) I and II (d) III and IV

191 Which of the following statements are true?

I. Molluscs possess cellular level of organisation.
II. Arthropods are true coelomates.
III. Platyhelminths are pseudocoelomates.
IV. Ctenophores have bilateral symmetry.

Choose the correct option.

(a) I and II (b) Only II
(c) I and IV (d) II, III and IV

192 Consider the following statements about arthropods.

I. Open circulatroy system is found in most arthropods.
II. Arthropods contain haemolymph which directly bathes the internal tissues and organs.

(a) I is true, but II is false
(b) I is false, but II is true
(c) Both I and II are true
(d) Both I and II are false

193 Consider the following statements.

I. Lancelets are jawless, primitive fish-like vertebrates.
II. In lancelets, notochord, tubular nerve cord and pharyngeal gill slits are present throughout their life.

(a) I is true, but II is false
(b) I is false, but II is true
(c) Both I and II are true
(d) Both I and II are false

194 Choose the correct option for the following statements.

I. All vertebrates are chordates.
II. Vertebrates possess notochord during embryonic period.

(a) I is true, but II is false
(b) II is true, but I is false
(c) Both I and II are true
(d) Both I and II are false

195 Which of the following statements are true/false?

I. In *Torpedo*, the electric organs are capable of generating strong electric shock to paralyse the prey.

II. Bony fishes use pectoral, pelvic, dorsal, anal and caudal fins in swimming.

III. Amphibian skin is moist and has thick scales.

IV. Birds are poikilothermous animals.

V. The most unique mammalian characteristic is the presence of milk producing mammary glands by which the young ones are nourished.

(a) I, II and III are true; IV and V are false
(b) I, II and V are true; III and IV are false
(c) I, II and III are false; IV and V are true
(d) I, II and IV are false; III, and V are true

III. Matching Type Questions

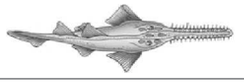
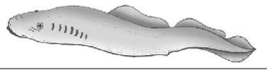
196 Match the following columns.

Column I (Level of organisation)	Column II (Animal phyla)
A. Cellular level of organisation	1. Cnidarians
B. Organ level of organisation	2. Platyhelminthes
C. Organ system level of organisation	3. Chordates
D. Tissue level of organisation	4. Porifera

Codes

	A	B	C	D		A	B	C	D
(a)	4	2	3	1	(b)	2	1	4	3
(c)	3	2	4	1	(d)	4	2	1	3

197 Match the following columns.

Column I (Animals)	Column II (Scientific names)
A. 	1. *Scoliodon*
B. 	2. *Pristis*
C. 	3. *Myxine*
D. 	4. *Catla*
	5. *Petromyzon*

Codes

	A	B	C	D
(a)	4	2	5	1
(b)	4	2	3	1
(c)	1	3	5	2
(d)	1	4	5	3

198 Match the following columns.

Column I (Mammals)	Column II (Scientific names)
A. 	1. *Ornithorhynchus*
B. 	2. *Oryctolagus cuniculus*
C. 	3. *Pteropus*
D. 	4. *Macropus*
	5. *Balaenoptera*

Codes

	A	B	C	D
(a)	3	4	5	2
(b)	3	4	5	1
(c)	1	2	5	4
(d)	5	4	3	2

199 Match the following organisms with their respective characteristics. ***NEET (National) 2019***

Column I	Column II
A. *Pila*	1. Flame cells
B. *Bombyx*	2. Comb plates
C. *Pleurobrachia*	3. Radula
D. *Taenia*	4. Malpighian tubules

Codes

	A	B	C	D		A	B	C	D
(a)	3	4	2	1	(b)	2	4	3	1
(c)	3	2	4	1	(d)	3	2	1	4

200 Match the following genera with their respective phylum ***NEET (Odisha) 2019***

Column I	Column II
A. *Ophiura*	1. Mollusca
B. *Physalia*	2. Platyhelminthes
C. *Pinctada*	3. Echinodermata
D. *Planaria*	4. Coelenterata

Codes

	A	B	C	D		A	B	C	D
(a)	4	1	3	2	(b)	3	4	1	2
(c)	1	3	4	2	(d)	3	4	2	1

201 Match the items in Column I with those in Column II and choose the correct option from the codes given below. ***NEET (Odisha) 2019***

	Column I		Column II
A.	Podocytes	1.	Crystallised oxalates
B.	Protonephridia	2.	Annelids
C.	Nephridia	3.	*Amphioxus*
D.	Renal calculi	4.	Filtration slits

Codes

	A	B	C	D		A	B	C	D
(a)	3	4	2	1	(b)	3	2	4	1
(c)	4	3	2	1	(d)	4	2	3	1

202 Match the following columns.

Column I (Specialised cell or part)		Column II (Animal phylum)
A. Choanocytes	1.	Platyhelminthes
B. Cnidoblasts	2.	Ctenophora
C. Flame cells	3.	Porifera
D. Nephridia	4.	Coelenterata
E. Comb plates	5.	Annelida

Codes

	A	B	C	D	E
(a)	2	1	4	5	3
(b)	2	4	1	5	3
(c)	5	1	3	2	4
(d)	3	4	1	5	2

203 Match the following columns.

Column I (Cnidarian)		Column II (Common names)
A. *Pennatula*	1.	Brain coral
B. *Meandrina*	2.	Sea fan
C. *Gorgonia*	3.	Sea pen
D. *Adamsia*	4.	Sea anemone

Codes

	A	B	C	D		A	B	C	D
(a)	3	1	2	4	(b)	1	3	2	4
(c)	2	4	1	3	(d)	2	3	4	1

204 Match the following columns.

Column I (Scientific names)		Column II (Common names)
A. *Physalia*	1.	Liver fluke
B. *Taenia*	2.	*Scypha*
C. *Fasciola*	3.	Tapeworm
D. *Sycon*	4.	Portuguese man of war

Codes

	A	B	C	D		A	B	C	D
(a)	2	1	3	4	(b)	4	3	1	2
(c)	1	3	2	4	(d)	1	2	3	4

205 Match the following columns.

Column I (Common name of arthropodes)		Column II (Scientific names)
A. Honeybee	1.	*Aedes*
B. Mosquito	2.	*Apis*
C. Lac insect	3.	*Laccifer*
D. Silkworm	4.	*Bombyx*

Codes

	A	B	C	D		A	B	C	D
(a)	1	2	3	4	(b)	3	1	2	4
(c)	2	1	3	4	(d)	4	1	3	2

206 Match the following columns.

Column I (Scientific names)		Column II (Common names)
A. *Ancylostoma*	1.	Hookworm
B. *Wuchereria*	2.	Filaria worm
C. *Ascaris*	3.	Roundworm
D. *Fasciola*	4.	Liver fluke
	5.	Flatworms

Codes

	A	B	C	D		A	B	C	D
(a)	1	4	3	5	(b)	2	5	1	3
(c)	4	1	5	3	(d)	1	2	3	4

207 Match the following columns.

Column I (Scientific names)		Column II (Common names)
A. *Branchiostoma*	1.	Hagfish
B. *Petromyzon*	2.	Lamprey
C. *Trygon*	3.	Sting ray
D. *Myxine*	4.	Ascidia
	5.	*Amphioxus*

Codes

	A	B	C	D		A	B	C	D
(a)	1	5	2	4	(b)	3	1	2	5
(c)	5	4	1	2	(d)	5	2	3	1

208 Match the following columns.

Column I (Parts/organs)		Column II (Functions)
A. Statocysts	1.	Radiating plates
B. Radula	2.	Respiratory function
C. Gills	3.	Organs of balance
D. Tentacles	4.	Sensory organs
	5.	Organs of feeding
	6.	Organs of locomotion

Codes

	A	B	C	D		A	B	C	D
(a)	4	1	3	6	(b)	3	5	2	4
(c)	4	1	5	6	(d)	2	3	5	4

209 Match the following columns.

	Column I (Animals)		Column II (Common names)
A.	*Loligo*	1.	Cuttlefish
B.	*Aplysia*	2.	Chiton
C.	*Sepia*	3.	Pearl oyster
D.	*Chaetopleura*	4.	Tusk shell
E.	*Pinctada*	5.	Squid
		6.	Sea hare

Codes

	A	B	C	D	E
(a)	6	3	1	4	5
(b)	5	4	6	2	3
(c)	4	5	3	1	6
(d)	5	6	1	2	3

210 Match the following columns.

	Column I (Features)		Column II (Animals)
A.	These possess electric organs	1.	*Trygon*
B.	Animals of this class are poikilothermous	2.	Cyclostomata
C.	These possess poison sting	3.	*Torpedo*
D.	These migrate for spawning to freshwater	4.	Chondrichthyes
		5.	Lamprey
		6.	*Exocoetus*

Codes

	A	B	C	D
(a)	6	1	3	2
(b)	1	4	6	5
(c)	3	4	1	5
(d)	3	4	6	2

211 Match the following columns.

	Column I (Animals)		Column II (Common names)
A.	*Chelone*	1.	Wall lizard
B.	*Bungarus*	2.	Viper
C.	*Calotes*	3.	Krait
D.	*Hemidactylus*	4.	Garden lizard
		5.	Turtle
		6.	Tortoise

Codes

	A	B	C	D		A	B	C	D
(a)	3	2	1	6	(b)	5	3	4	1
(c)	5	4	1	6	(d)	2	5	1	6

212. Match the following columns.

	Column I (Animals)		Column II (Common names)
A.	*Hippocampus*	1.	Fighting fish
B.	*Betta*	2.	Great white shark
C.	*Clarias*	3.	Sea horse
D.	*Labeo*	4.	Angelfish
		5.	Rohu
		6.	Magur

Codes

	A	B	C	D		A	B	C	D
(a)	3	1	6	5	(b)	6	2	4	1
(c)	3	2	6	4	(d)	4	1	6	5

213 Match the following columns.

	Column I (Parts/cells)		Column II (Features)
A.	Thesocytes	1.	Spongin fibres
B.	Gemmules	2.	Food storing cells
C.	Osculum	3.	Involved in reproduction
D.	Spicules	4.	Collar cells
		5.	Water exits the spongocoel through this structure

Codes

	A	B	C	D
(a)	1	2	3	4
(b)	3	1	4	5
(c)	2	3	4	1
(d)	2	3	5	1

214 Match the following columns.

	Column I (Characteristics)		Column II (Animals)
A.	Diploblastic, radial symmetry and tissue level organisation	1.	*Wuchereria*
B.	Triploblastic, pseudocoelomates and complete digestive system	2.	*Dugesia*
C.	Bilateral symmetry, incomplete digestive system, organ and organ system level of organisation	3.	*Cucumaria*
D.	Triploblastic, coelomate, radial symmetry	4.	*Balanoglossus*
		5.	*Hydra*

Codes

	A	B	C	D
(a)	2	1	4	5
(b)	3	2	1	5
(c)	4	3	2	5
(d)	5	1	2	3

215 Match the following columns.

Column I (Animal phyla)	**Column II** (Development)	**Column II** (Fertilisation)
A. Porifera	(i) Direct	(1) External
B. Ctenophora	(ii) Indirect	(2) Internal
C. Aschelminthes	(iii) Both direct and indirect	(3) Both external and internal
D. Arthropoda		
E. Echinodermata		
F. Hemichordata		

Codes

	A	B	C	D	E	F
(a)	ii, 2	ii, 1	iii, 2	iii, 2	ii, 1	ii, 1
(b)	i, 1	ii, 2	iii, 2	iii, 2	iii, 1	iii, 1
(c)	ii, 1	ii, 1	iii, 2	iii, 2	ii, 1	ii, 1
(d)	iii, 1	ii, 2	ii, 3	iii, 2	i, 2	i, 2

216 Match the following columns.

	Column I (Parts)		**Column II** (Description)
A.	Hypostome or manubrium	1.	The oral tip surrounded by tentacles in *Hydra*
B.	Muscular pharynx	2.	Present in Aschelminthes to ingest food.
C.	Radula	3.	Rasping organ for feeding in *Pinctada*
D.	Malpighian tubules	4.	Excretory organ in cockroach

Codes

	A	B	C	D
(a)	1	2	3	4
(b)	4	3	2	1
(c)	2	1	4	3
(d)	3	4	2	1

NCERT Exemplar

MULTIPLE CHOICE QUESTIONS

217 In some animal groups, the body is found divided into compartments with at least some organs. This characteristic feature is called

(a) segmentation (b) metamerism
(c) metagenesis (d) metamorphosis

218 Given below are types of cells present in some animals. Which of the following cells can differentiate to perform different functions?

(a) Choanocytes
(b) Interstitial cells
(c) Gastrodermal cells
(d) Nematocysts

219 Which one of the following sets of animals share a four-chambered heart?

(a) Amphibian, reptiles, birds
(b) Crocodiles, birds, mammals
(c) Crocodiles, lizards, turtles
(d) Lizards, mammals, birds

220 Which of the following pairs of animals has non-glandular skin?

(a) Snake and frog
(b) *Chameleon* and turtle
(c) Frog and pigeon
(d) Crocodile and tiger

221 Birds and mammals share one of the following characteristics as a common feature.

(a) Pigmented skin
(b) Pneumatic bones
(c) Viviparity
(d) Warm-blooded body

222 Which one of the following sets of animals belongs to a single taxonomic group?

(a) Cuttlefish, jellyfish, silverfish, dogfish, starfish
(b) Bat, pigeon, butterfly
(c) Monkey, chimpanzee, man
(d) Silkworm, tapeworm, earthworm

223 Which one of the following statements is incorrect?

(a) Mesoglea is present in between ectoderm and endoderm in *Obelia*
(b) *Asterias* exhibits radial symmetry
(c) *Fasciola* is a pseudocoelomate animal
(d) *Taenia* is a triploblastic animal

224 Which one of the following statements is incorrect?

(a) In cockroaches and prawns, excretion of waste material occurs through Malpighian tubules
(b) In ctenophores, locomotion is mediated by comb plates
(c) In *Fasciola* flame cells take part in excretion
(d) Earthworms are hermaphrodites and yet cross fertilisation takes place among them

225 Which one of the following is not a poisonous snake?
(a) Cobra (b) Viper
(c) *Python* (d) Krait

226 Match the following list of animals with their level of organisation.

	Level of Organisation		Animal
A.	Organ level	1.	*Pheretima*
B.	Cellular aggregate level	2.	*Fasciola*
C.	Tissue level	3.	*Spongilla*
D.	Organ system level	4.	*Obelia*

Codes

	A	B	C	D		A	B	C	D
(a)	2	3	4	1	(b)	2	4	3	1
(c)	4	1	2	3	(d)	1	4	3	2

227 Body cavity is the cavity present between body wall and gut wall. In some animals the body cavity is not lined by mesoderm. Such animals are called
(a) acoelomate (b) pseudocoelomate
(c) coelomate (d) haemocoelomate

228 Match the following columns.

	Column I (Phylum)		Column II (Characteristic features)
A.	Porifera	1.	Canal system
B.	Aschelminthes	2.	Water vascular system
C.	Annelida	3.	Muscular pharynx
D.	Arthropoda	4.	Jointed appendages
E.	Echinodermata	5.	Metameres

Codes

	A	B	C	D	E
(a)	2	3	5	4	1
(b)	2	5	3	4	1
(c)	1	3	5	4	2
(d)	1	5	3	4	2

229 Which one of the following is oviparous?
(a) Platypus
(b) Flying fox (bat)
(c) Elephant
(d) Whale

Answers

› *Mastering NCERT with MCQs*

1 (d)	**2** (c)	**3** (d)	**4** (c)	**5** (d)	**6** (c)	**7** (b)	**8** (b)	**9** (c)	**10** (c)	**11** (a)	**12** (b)	**13** (b)	**14** (a)	**15** (c)
16 (c)	**17** (c)	**18** (b)	**19** (d)	**20** (d)	**21** (b)	**22** (d)	**23** (a)	**24** (d)	**25** (d)	**26** (c)	**27** (a)	**28** (c)	**29** (c)	**30** (d)
31 (a)	**32** (a)	**33** (c)	**34** (c)	**35** (b)	**36** (b)	**37** (b)	**38** (c)	**39** (b)	**40** (c)	**41** (d)	**42** (d)	**43** (b)	**44** (b)	**45** (c)
46 (c)	**47** (b)	**48** (c)	**49** (d)	**50** (a)	**51** (a)	**52** (b)	**53** (a)	**54** (b)	**55** (d)	**56** (c)	**57** (c)	**58** (a)	**59** (b)	**60** (a)
61 (c)	**62** (a)	**63** (c)	**64** (b)	**65** (b)	**66** (b)	**67** (c)	**68** (d)	**69** (d)	**70** (b)	**71** (d)	**72** (d)	**73** (d)	**74** (c)	**75** (b)
76 (b)	**77** (c)	**78** (b)	**79** (d)	**80** (b)	**81** (b)	**82** (b)	**83** (c)	**84** (c)	**85** (b)	**86** (d)	**87** (d)	**88** (a)	**89** (d)	**90** (c)
91 (a)	**92** (d)	**93** (a)	**94** (d)	**95** (b)	**96** (d)	**97** (d)	**98** (c)	**99** (b)	**100** (b)	**101** (c)	**102** (a)	**103** (c)	**104** (a)	**105** (d)
106 (c)	**107** (d)	**108** (d)	**109** (d)	**110** (d)	**111** (c)	**112** (c)	**113** (b)	**114** (a)	**115** (d)	**116** (b)	**117** (b)	**118** (d)	**119** (d)	**120** (a)
121 (d)	**122** (b)	**123** (d)	**124** (c)	**125** (c)	**126** (d)	**127** (d)	**128** (d)	**129** (b)	**130** (d)	**131** (b)	**132** (d)	**133** (d)	**134** (b)	**135** (c)
136 (d)	**137** (d)	**138** (b)	**139** (a)	**140** (d)	**141** (d)	**142** (a)	**143** (c)	**144** (c)	**145** (d)	**146** (c)	**147** (a)	**148** (c)	**149** (b)	**150** (c)
151 (c)	**152** (d)	**153** (c)	**154** (d)	**155** (c)	**156** (d)	**157** (c)	**158** (b)	**159** (b)	**160** (c)					

› *NEET Special Types Questions*

161 (a)	**162** (b)	**163** (c)	**164** (a)	**165** (c)	**166** (d)	**167** (a)	**168** (a)	**169** (b)	**170** (d)	**171** (a)	**172** (c)	**173** (c)	**174** (d)	**175** (d)
176 (d)	**177** (b)	**178** (d)	**179** (d)	**180** (c)	**181** (b)	**182** (d)	**183** (b)	**184** (d)	**185** (c)	**186** (c)	**187** (a)	**188** (a)	**189** (b)	**190** (c)
191 (b)	**192** (c)	**193** (c)	**194** (c)	**195** (b)	**196** (a)	**197** (a)	**198** (b)	**199** (a)	**200** (b)	**201** (c)	**202** (d)	**203** (a)	**204** (b)	**205** (c)
206 (d)	**207** (d)	**208** (b)	**209** (d)	**210** (c)	**211** (b)	**212** (a)	**213** (d)	**214** (d)	**215** (a)	**216** (a)				

› *NCERT Exemplar Questions*

217 (b)	**218** (b)	**219** (b)	**220** (b)	**221** (d)	**222** (c)	**223** (c)	**224** (a)	**225** (c)	**226** (a)	**227** (b)	**228** (c)	**229** (a)

Answers & Explanations

2 (*c*) In order to attain complexity, the cells performing the same function are arranged into groups, knows as tissues. This leads to the formation of tissue level of organisation, e.g. ctenophores and cnidarians.

4 (*c*) Option (c) is incorrect and it can be corrected as

Open type of circulatory system is the one in which the blood is pumped out of the heart and the cells and tissues are directly bathed in it.

5 (*d*) Phylum–Coelenterata, Echinodermata and Ctenophora are the only phyla, which exhibit radial symmetry. However, one must remember that echinoderms look like radially symmetrical, but their original symmetry is bilateral. This type of symmetry is called pentamerous symmetry.

7 (*b*) In bilaterally symmetrical animals, the response to external stimulus is quicker and more precise.

10 (*c*) Poriferans, coelenterates and ctenophores are diploblastic animals, while all animals included in phylum–Platyhelminthes to phylum–Chordata are triploblastic animals. Protozoans are single-celled animals and do not form any germ layers.

11 (*a*) Echinoderms include triploblastic animals, i.e. those animals which form three germ layers during embryonic development.

12 (*b*) Ectoderm, endoderm and mesoderm are the differentiated embryonic layers in animals. Mesoglea is the undifferentiated layer present in between the ectoderm and endoderm in sponges.

13 (*b*) Body cavity lined by mesoderm is referred to as coelom. It is absent in acoelomate animals. When the mesoderm is present as scattered pouches in between ectoderm and endoderm, such animals are called pseudocoelomates.

15 (*c*) Aschelminthes are pseudocoelomate (false coelom derived from embryonic blastocoel), triploblastic, bilaterally symmetrical and unsegmented organisms.

16 (*c*) The given cross-section is of *Planaria* an acoelomate flatworm. Flatworms are devoid of cavities in between the alimentary canal and body wall and hence are called acoelomate.

18 (*b*) Notochord is derived from mesoderm and is formed on the dorsal side of chordate animals during their embryonic development.

20 (*d*) *Euspongia*, *Fasciola* and *Hydra* belongs to phylum–Porifera, Platyhelminthes and Coelenterata, respectively. These do not contain the tube-within-tube body plan.

Tube-within-tube is a body plan in which digestive canal is present inside the body cavity have appears tube with in a tube. All animals from the phylum–Aschelminthes to Chordata have tube-within-tube body plan and may be either protostomous or deuterostomous.

22 (*d*) The match in option (d) is false. It can be corrected as

Annelids are coelomates.
Rest of the matches are correct.

25 (*d*) Echinoderms are triploblastic animals with organ system level of organisation in which, the larval forms exhibit bilateral symmetry, while the adults show radial pentamerous symmetry.

26 (*c*) The option (c) is incorrect. It can be corrected as

Notochord is formed during embryonic development. But it does not persist throughout life in human as it gets replaced by the vertebral column in adult stage.

28 (*c*) Choanocytes are the flagellated cells lining the spongocoel (central cavity) in poriferans or sponges. The function of a choanocyte is to create water flow through the body of a sponge. This allow nutrients to filter through and feed the sponge.

29 (*c*) Water exits the spongocoel (central cavity) in sponges through the osculum. Ostia are the minute pores on the body, through which water enters the spongocoel. Ommatidia are present in insect eye. Choanocytes are flagellated cells in sponges.

30 (*d*) The body wall of a common sponge consists of three layers, i.e. pinacoderm, choanoderm and mesophyll layer. Choanoderm is the inner cellular layer which consists of choanocytes.

31 (*a*) The ascon type is the simplest type of canal system found in asconoid sponges like *Leucosolenia*. The course of water current is ascon type of canal system looks like

$$\text{Ingressing water} \xrightarrow[\text{Ostia}]{\text{Through}} \text{Spongocoel} \xrightarrow{\text{Through osculum}} \text{Exterior}$$

32 (*a*) Bodies of the animals belonging to the phylum–Porifera are made up of spicules or spongin fibres.

33 (*c*) Asexual reproduction in sponges takes place by fragmentation. Encystment occurs in cnidarians. Multiple fission and binary fission occurs in protozoans.

35 (*b*) In Porifera (sponges), bodies are asymmetrical. Body lacks tissue or organs, but forms a meshwork of cells surrounding channels that open to the outside through pores and that expand into internal cavities lined with food filtering flagellated cells (choanocytes).

Development is indirect having a larval stage which is morphologically distinct from adult.

36 (*b*) *Spirulina* is an alga and not a poriferan which serves as a food source for protein used by astronaut. Rest three animals belong to Porifera.

37 (*b*) Option (b) is not correct for coelenterates as the Phylum–Coelenterata or Cnidaria have tissue level of organisation. Cellular level of organisation is only present in phylum–Porifera. Rest options are correct.

38 (*c*) Phylum–Coelenterata or Cnidaria are divided into class–Scyphozoa, Anthozoa and Hydrozoa. Actinozoa is another name for class–Anthozoa.
Class–Desmospongia belongs to phylum–Porifera.

39 (*b*) *Leucosolenia* never performs locomotion, because they are sessile. *Ascaris* is a parasite. *Hydra* locomotes by contracting its body muscles.

42 (*d*) Cnidarians exhibit two basic body forms called medusa (A) and polyp (B). Polyp is sessile form and medusa is a free-swimming umbrella-shaped forms. Polyp (B) produce medusa (A) asexually and medusa (A) form the polyp (B) sexually.

44 (*b*) The medusa of *Obelia* shows radial symmetry. It is a free-swimming, umbrella-like sexual generation. It is formed by blastostyle. It brings about sexual reproduction and dispersal of species.

45 (*c*) Metagenesis is seen in those forms of phylum–Coelenterata that exist in both body forms, i.e. polyp and medusa, e.g. *Obelia*.

46 (*c*) Skeleton of corals is composed of calcium carbonate. Siliceous spicules and calcareous spicules are present in phylum–Porifera.

47 (*b*) In *Hydra*, the asexual reproduction mainly occurs through external budding in the middle and basal part of the body. The bud initially seen as a protuberance, which gradually grows as a diverticulum. Soon, it develops gastrovascular cavity, tentacles, hypostome and mouth. The cavity of bud later on separates off from the parent body. Thus, forming a young *Hydra*.

48 (*c*) The figure represents cnidoblast or cnidocyte, found in animals of the phylum–Coelenterata.
Cnidoblasts contain stinging capsule, which releases the toxin, thus used in the defence mechanism by the animals belonging to phylum–Coelenterata.

49 (*d*) Cnidarian members are found both in freshwater and marine environments, while members of Ctenophora, Cephalochordata and Echinodermata are found exclusively in marine environment.

50 (*a*) The members of the phylum – Ctenophora appear like jellies and have eight external rows of ciliated comb plates.

51 (*a*) Phylum–Ctenophora shows similarities (affinities) with phylum–Cnidaria. The similarities are lack of coelom, presence of radial symmetry, diploblastic body wall, absence of organ systems, presence of statocyst, presence of tentacles, etc.

52 (*b*) *Ctenoplana* belongs to phylum–Ctenophora. Reproduction in all the animals belonging to phylum–Ctenophora takes place by sexual reproduction only.

53 (*a*) Animals of phylum–Platyhelminthes have hooks and suckers and are endoparasite of other animals.
These are triploblastic, bilaterally symmetrical, acoelomate animals with blind sac body plan. They live as endoparasites in intestine of other animals. For this purpose, they bear hooks or suckers near their mouth region which help them to cling on the intestinal walls of the host and obtain nutrition.

55 (*d*) *Fasciola* belong to Phylum–Platyhelminthes. Animals of these phyla have flame cells which helps in excretion.

57 (*c*) *Fasciola* or liverfluke, *Planaria* and *Taenia* or tapeworm are examples of animals that belong to phylum–Platyhelminthes. *Ascaris* or round worm is an example of phylum–Aschelminthes.

58 (*a*) Option (a) is correct for Platyhelminthes. Rest are incorrect and can be corrected as
- These are mostly endoparasites found in animals (including humans).
- These contain an incomplete digestive system.
- Polyembryony is the development of two or more embryos from a single fertilised egg. This phenomenon occurs commonly in vertebrates, invertebrates and plants (not in Platyhelminthes).

59 (*b*) If a living *Hydra* and *Planaria* is cut into two, three or more pieces, every piece develops into a new individual as *Hydra* and *Planaria* reproduces asexually by regeneration.

60 (*a*) Trichocyst and nematocyst release toxins, which is used to kill prey and thus used in defence mechanism by the organism.

61 (*c*) Members of the phylum – Aschelminthes have both mouth and anus. Thus, this phylum is said to be the first to have a complete digestive system (alimentary canal).

62 (*a*) Aschelminthes are dioecious with separate sexes and females are usually longer than males.

63 (*c*) *Trichinella spiralis* shows viviparity. It is a parasitic nematode which copulate in human intestine, after which male dies and female produces larvae, which enter into the human blood circulation to reach the muscles. The production of larvae indicates vivipary.

65 (*b*) Hookworm or *Ancyclostomata* belongs to phylum–Aschelminthes. It is a triploblastic pseudocoelomate, bilaterally symmetrical human parasite, which is oviparous and causes an ancylostomiasis disease through contaminated soil.

66 (*b*) *Ascaris* is characterised by the presence of neither true coelom nor metamerism. Body of *Ascaris* is elongated, cylindrical gradually tapering at both ends. There is no metameric segmentation. The cavity between body wall and visceral organs is a spacious fluid filled cavity.
This cavity is not true coelom as it is not lined by coelomate epithelium, has no relation with reproductive and excretory organs and develops from blastocoel.

68 (*d*) Phylum–Annelida is named, so because the animals belonging to this phylum has the body, which is marked into distinct segments or metameres.

69 (*d*) Annelids are true coelomates with bilateral symmetry. Platyhelminthes are acoelomates, Aschelminthes are pseudocoelomates and adult echinoderms show radial symmetry.

70 (*b*) Longitudinal and circular muscles are useful in locomotion in animals of the phylum–Annelida.

Nephridia are the part of the excretory and osmoregulatory system. Organs of bursa are copulatory organs present in male hookworms. Spicules are present in animals belonging to phylum–Porifera.

71 (*d*) Metamerism first appeared in members of phylum – Annelida. Metamerism refers to the phenomenon in which there is a serial repetition of atleast some organs with external and internal division of the body.

73 (*d*) Earthworm, tapeworm, leech and sponge are all hermaphrodite animals. These animals do not have separate sexes. But animals like housefly, frog, sea horse and roundworm (*Ascaris*) are dioecious, i.e. male and female sexes are present in distinct organism.

74 (*c*) *Pheretima* (earthworm), *Tubifex* and *Nereis* belong to phylum–Annelida. *Aphrodite, Pila, Dentalium* and *Aplysia* belong to Mollusca. *Wuchereria* belongs to Aschelminthes and *Hirudinaria* is also an annelid.

76 (*b*) Parapodia are present in aquatic annelids like *Nereis*, which help them in swimming. Other three features, i.e. metameric segmentation, jointed appendages and chitinous exoskeleton are present in phylum–Arthropoda. Out of these, metameric segmentation is visible as tagmetisation.

77 (*c*) Exoskeleton of insects is primarily made up of proteins and chitin (N-acetyl glucosamine) interwoven and linked together to form strong flexible bundles. The rigid and strong nature of exoskeleton allows insects to become complex and diversity with regards to size, shape, colour and show adaptable modifications.

80 (*b*) Option (b) is incorrect becasue arthropods can have simple or compound eyes.

81 (*b*) Cockroach, scorpion and prawn belong to phylum–Arthropoda. *Schistosoma* and *Planaria* belongs to Platyhelminthes. *Chiton* and *Neopilina* belongs to Mollusca.

83 (*c*) Locust are of no economic importance, instead are gregarious pests that may even completely destroy crops.

84 (*c*) Phylum–Mollusca is the second largest phylum containing more than 1,00,000 species and probably the most sophisticated of all invertebrates. Phylum–Arthropoda is the first largest phylum, having most successful invertebrates, in terms of number of species (about 9,00,000).

85 (*b*) Option (b) is correct. Other options can be corrected as

Phylum–Mollusca do not have metameric segmentation, they have a calcareous exoskeleton with organ system level of organisation, but shows the presence of mantle cavity and coelomic cavity during development.

86 (*d*) The body of animals belonging to phylum–Mollusca are divided into head, muscular foot and visceral hump, while animals belonging to phylum–Arthropoda is divided into head, thorax and abdomen.

87 (*d*) Radula is present in animals belonging to phylum–Mollusca. It is a rasping organ of molluscs situated in a sac on the underside of buccal cavity. It is used for tearing plant material by rubbing it against the hardened surface of the mouth. Suckers are present in parasitic platyhelminthes to enable them to absorb nutrients from the host.

Undulating membrane and sucktorial organs are present in ciliated protozoans. Ctenidia are the gills of aquatic molluscs.

88 (*a*) Out of the given options, radula, the rasping organ used for feed is found in *Loligo* (squid).

Merceneria, Argopecten and oysters do not possess radula.

89 (*d*) Option (d) is incorrect. It can be corrected as

Molluscs are terrestrial or aquatic (marine or freshwater) having an organ system level of organisation. They are bilaterally symmetrical, triploblastic and coelomate, e.g. *Pila*.

90 (*c*) Option (c) is incorrect match. It can be corrected as *Pila* is apple snail. Chiton is *Chaetopleura*. Rest all are correct.

91 (*a*) Development of Mollusca is similar to annelids in a way that their indirect development is with trochopore larvae. Molluscs also show direct development in some forms.

92 (*d*) Cephalopods such as *Octopus*, cuttlefish and squid (coleoids) are the most advanced invertebrates among the given options. They belong to class–Cephalopoda of phylum–Mollusca.

These organisms have a prominent head and a set arms or tentacles. They are widely regarded as the most intelligent of invertebrates and have well-developed senses and larger brains. Their nervous system is the most complex of all invertebrates.

93 (*a*) Echinoderms are exclusively marine and have no freshwater forms. The animals of this phylum are largely bottom dwellers, enterocoelous coelomate and triploblastic.

94 (*d*) Echinoderms are ammonotelic and nitrogenous wastes are excreted *via* gills, bursae, respiratory trees and tube feet.

98 (*c*) Option (c) is correct. *Antedon* or sea lily, *Cucumaria* or sea cucumber, *Echinus* or sea urchins and *Ophiura* or brittle star belong to phylum–Echinodermata. Cuttlefish or *Sepia*, *Chaetopleura* or chiton and *Aplysea* or sea hare belong to phylum–Mollusca.

99 (*b*) Sea hare belongs to phylum–Mollusca, sea cucumber (*Cucumaria*), sea urchin (*Echinus*) and sea lily (*Antedon*) belong to phylum–Echinodermata.

101 (*c*) All the given animals except **earthworm** undergoes metamorphosis. Earthworm exhibits direct development where no larval stage is involved.

Metamorphosis is usually seen in animals exhibiting indirect development, involving a larval stage which later transformed into an adult.

Larval form of **moth** is caterpillar and that of **tunicates** is tadpole. In **starfish**, bipinneria larva occurs.

102 (*a*) Option (a) is incorrectly matched and can be corrected as

Pila has unsegmented body. It is a mollusc animal.

Rest options are correct.

103 (*c*) The important characteristic that hemichordates share with chordates is pharynx with gill slits. These gill slits are narrow openings in the pharynx. The position of these pharyngeal gill slits is lateral in chordates, while dorsal in hemichordates.

106 (*c*) The body of *Balanoglossus* is cylindrical and composed of an anterior proboscis, a collar and a long trunk.

107 (*d*) Hemichordates have a rudimentary structure in the collar region called stomochord, a structure similar to notochord. They are worm-like marine animals. Respiration takes place through gills. Thus, option (d) is correct.

114 (*a*) Option (a) contains the correct pair of difference between notochord in Urochordata and Cephalochordata. In Urochordata, notochord is present only in larval tail, while in Cephalochordata, it extends from head to tail region and is persistent throughout their life.

117 (*b*) Option (b) is incorrect about the class–Cyclostomata. It can be corrected as

Cyclostomata have elongated body devoid of scales and paired fins.

118 (*d*) *Myxine* is a member of the class–Cyclostomata that has 6-15 pairs of gill slits and a closed circulatory system. They do not have jaws.

119 (*d*) *Petromyzon* (the lamprey) belongs to the section Agnatha of class–Cyclostomata of the subphylum–Vertebrata. They lay eggs in freshwater, but their ammocoete larvae (lower) after metamorphosis return to the ocean.

120 (*a*) Option (a) is correctly matched as *Petromyzon* (lamprey) is an ectoparasite on fishes, which belongs to Cyclostomata. Other options can be corrected as

Ichthyophis is a limbless amphibian. *Limulus* (king crab) is a living fossil, which belongs to Arthropoda.

Adamsia having polyp body form is a coelenterates.

121 (*d*) Chondrichthyes is one of the class of superclass–Pisces, subphylum–Vertebrata and phylum–Chordata. The mouth of the members of class–Chondrichthyes is located ventrally and the teeth are modified placoid scales, which are in backward direction.

123 (*d*) Chondrichthyes are devoid of air bladder and thus they have to swim constantly to avoid sinking. Hence, the presence of air bladder is not a characteristic feature of Chondrichthyes.

124 (*c*) The given figure is that of *Hippocampus* (sea horse) which is a bony fish. It does not have a poisonous sting at tail and this feature is present in *Trygon*.

125 (*c*) Out of the given examples of bony fishes, *Hippocampus* (sea horse) and *Exocoetus* (flying fish) are marine fishes, i.e. these are found in sea water.

Clarias, Catla and *Labeo* are freshwater fishes, i.e. these are found in rivers, lakes, etc.

127 (*d*) Swim bladder/Air bladder in bony fishes regulates buoyancy. This helps them to stay at any particular depth in water without spending energy.

129 (*b*) *Clarias*, a bony fish contains an air/swim bladder.

Torpedo, Scolidon and *Elasmobranch* come under the class–Chondrichthyes and hence do not possess an air bladder.

130 (*d*) The given figure is of a frog which is an amphibian. Amphibians have a eyes with eyelids.

131 (*b*) Option (b) is correct as

Class–Amphibia and class–Reptilia share the following features.

The presence of tympanum is seen in both classes, which represents the ear.

Animals of both classes are cold-blooded or poikilotherms and usually have a three-chambered heart (except crocodile).

132 (*d*) Option (d) is correct. Reptiles are different from amphibians have a smooth moist skin, while the reptilian skin is scaly, rough and dry, and is periodically shed off by a process of moulting.

The amphibian heart is three-chambered, while the reptilian heart is four-chambered.

The amphibian larva usually undergoes metamorphosis unlike the reptilian young one.

133 (*d*) Both snakes and frogs (adults) respire through lungs. Frog tadpoles breathe through gills under water, but adult frogs breathe through lungs and moist skin.

Diaphragm is absent in both frogs and snakes. Only frogs utilise their buccal cavity to carry out buccopharyngeal respiration.

135 (*c*) The class name Reptilia refers to their creeping or crawling mode of locomotion (Latin, *repere* or reptum to creep or crawl).

136 (*d*) *Chameleon* belongs to suborder–Zacertilia includes lizards of order–Squamata. Syndactyly (refers to a condition where two or more digits are fused together); prehensile tail and long protrusible tongue are the unique features of *Chameleon.*

139 (*a*) Option (a) is correct as Animal 'A' is *Salamandra* and 'B' is *Chameleon. Salamandra* is an amphibian, with 3-chambered heart and shows external fertilisation. *Chameleon* on the other hand is a reptile with 3-chambered heart and shows internal fertilisation.

140 (*d*) Option (d) is correct. Other options are incorrect and can be corrected as

- *Pteropus* (flying fox) shows viviparity but not *Ornithorhynchus* (platypus).
- Garden lizard have 3-chambered heart, but crocodile have 4-chambered heart.
- *Ancylostoma* shows metamerism, but not *Ascaris.*

141 (*d*) Option (d) is incorrect for Aves and can be corrected as

The forelimbs of Aves are modified into wings and have powerful flight muscles. Rest options are correct.

143 (*c*) Birds and mammals maintain constant body temperature and hence are called homiothermous.

144 (*c*) Aves (e.g. pigeon) contain pneumatic bones. Pneumatic bones contain air cavities to reduce body weight and thus aid which in flying. Other options are not example of Aves.

146 (*c*) Beak or bill of birds is formed due to prolonged growth in jaw bones. Beak of birds never bears teeths, rest three options may be exception in birds.

147 (*a*) Crop and gizzard are found in the digestive tract of birds (Aves). Crop helps in storage and softening of food particles whereas gizzard (muscular stomach) helps in crushing and churning of food.

148 (*c*) Certain amphibians like the *Chameleon* are able to change colour, this is known as metachrosis.

150 (*c*) Mammalia is the only class in which members contains mammary glands and hence is an unique characteristic among the members of this class.

153 (*c*) The group of animals in which females give birth to young ones are called viviparous and this phenomenon as vivipary, e.g. rabbit, dog, humans, etc.

154 (*d*) The presence of muscular diaphragm is an exclusive character of mammals. A complete muscular partition separates the thoracic cavity housing the heart and the lungs from the abdominal cavity containing all other viscera. This is called the diaphragm. Its function is to increase the efficiency of breathing.

155 (*c*) The character mentioned in option (c) is not a mammalian character without exception.

Mammals such as doplhins, whales, elephants, mole, rats, etc., have little to no body hair.

Rest of the options contain characters that are present in all the mammals without exception.

157 (*c*) Option (c) is odd as

Neophron–Vulture is a bird. Rest of the animals are all mammals.

158 (*b*) Among the given animals *Chelone* is not a homeotherm. It is green sea turtle belonging to class–Reptilia which are ectotherms or cold-blooded and their internal body temperature varies according to the ambient environment. Rest all are homotherms.

160 (*c*) Among the given options, option (c) contains all aquatic mammals. Whales are inhabitants of the open sea, while seal (*Phoca*) is a marine carnivore. Dolphins are found in rivers.

Trygon and sharks are fishes, which belong to class–Chondrichthyes of superclass–Pisces.

161 (*a*) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.

Radial symmetry is advantageous as it allows the animal to respond to stimulus from any direction, allowing it to detect food and danger easily.

162 (*b*) Both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

Tapeworm (*Taenia solium*) belongs to Platyhelminthes and roundworm (*Ascaris*), pinworm (*Enterobius*) belong to Aschelminthes. All of these are endoparasites and cause intestinal infection.

The main cause of the intestinal infection is improperly cooked food. However, tapeworm infection occurs by eating improperly cooked food, *Ascaris* is transmitted by contaminated food and water and *Enterobius vermicularis* or pinworm may be transmitted through food or improper sanitary conditions.

163 (*c*) Assertion is true, but Reason is false. Reason can be corrected as

Taenia and *Dugesia* both belong to Platyhelminthes. Platyhelminthes are acoelomate animals.

164 (*a*) Both Assertion and Reason are true and Reason is correct explanation of Assertion.

In gastropods, the skin of visceral mass forms a thin delicate covering called mantle over the head.

The hindgut of alimentary canal is composed of rectum and anus. The anus is located at anterior end. Due to torsion during the developmental stages in most gastropods, the visceral mass and the shell of embryo become spirally coiled (due to unequal growth).

165 (*c*) Assertion is true, but Reason is false. Reason can be corrected as

Amphibians cannot live in the sea water because their body will lose water due to high salinity of sea water by exosmosis as their body lacks scales or an impermeable exoskeleton.

166 (*d*) Assertion is false and Reason is true. Assertion can be corrected as

Many animals have both an endoskeleton and an exoskeleton such as *Chelon* (turtle) or *Testudo*-(tortoise). During embryonic stage, skeleton cells migrate to produce both exoskeleton and endoskeleton.

167 (*a*) Both the Assertion and Reason are true and Reason is the correct explanation for Assertion.

Aves feed more often than reptiles because Aves are endothermic (homeotherms) and need to produce heat through various metabolic activities in order to constantly maintain body temperature. Whereas amphibians are poikilotherms thus do need more energy because their body temperature changes with respect to surrounding.

169 (*b*) The statement in option (b) is correct. Rest of the statement are incorrect and can be corrected as Phylum–Porifera have choanocyte cells, but nematocyst is present in cnidoblasts cells and is seen in animals that belong to phylum–Coelenterata. All ctenophoras exhibit radial symmetry. *Wuchereria* belongs to phylum–Aschelminthes.

170 (*d*) Option (d) is incorrect and can be corrected as *Pleurobrachia* belongs to phylum–Ctenophora. There reproduction is only by sexual means. Ctenophora are diploblastic, with tissue level of organisation and have of comb plates. Comb plates are characteristic feature of phylum–Ctenophora.

171 (*a*) The statement in option (a) is correct. Rest of the statements are incorrect and can be corrected as

Molluscs are coelomates, flatworms are acoelomates and insects are coelomates.

172 (*c*) The statement in option (c) is incorrect and can be corrected as

The excretory system in Annelida consists of nephridia. Flame cells are part of the excretory system of animals belonging to phylum–Platyhelminthes. Rest statements are correct.

173 (*c*) The statement in option (c) is incorrect and can be corrected as

Echinoderms are deuterostomous coelomates. These are animals in which blastopore of gastrula becomes the anus in the adult, e.g. Echinodermata and Chordata.

Rest all statements are correct.

175 (*d*) Option (d) is the correct statement.

Animal A – Liver fluke (*Fasciola*), bilaterally symmetrical, acoelomate, endoparasite, monoecious.

Animal B – *Nereis*, free-living, aquatic, bilateral symmetry, coelomate, dioecious.

Animal C – *Pila*, aquatic, bilateral symmetry, coelomate, dioecious.

Animal D – *Asterias*, aquatic, radial symmatry, coelomate, dioecious.

177 (*b*) Option (b) is correct. Other statements can be corrected as

- Mammals can be oviparous or viviparous.
- Reptiles are with 3-chambered heart except crocodiles which are with 4-chambered heart.
- Pisces have gills covered by operculum in Osteichythes and without it in Chondrichthyes.

178 (*d*) The statement in option (d) is incorrect and can be corrected as

Notochord is persistent throughout life in Osteichthyes as vertebral column.

179 (*d*) The statement given in option (d) is incorrect. It can be corrected as

Female cartilaginous fishes do not have claspers. Claspers are the special copulatory organs that are possessed only by the male cartilaginous fishes.

180 (*c*) The statement given in option (c) is correct for the figure of *Catla* given. Rest of the statements are incorrect and can be corrected as

- Its skin is covered with cycloid/ctenoid scales.
- Bony fishes have four pairs of gills covered by an operculum on each side.
- Mouth is mostly terminal and jaws are not as powerful as that of cartilaginous fishes.

181 (*b*) Option (b) is correct without exception. Other options can be correctly described as

- All reptiles have 3-chambered heart except crocodiles.
- Sponges are mostly marine, but freshwater forms also exist.
- Mammals can be oviparous or viviparous.

183 (*b*) All statements are false.

The corrected form of the statements are

- In higher phyla, organ and organ system level of organisation is seen.
- Phylum–Platyhelminthes have organ level of body organisation.
- Cellular level of organisation is seen when the cells are arranged as loose cell aggregates.
- Molluscs exhibit organ level of body organisation.

184 (*d*) Only the statement III is correct. Rest of the statements are incorrect and can be corrected as

- Cell aggregate body plan is only found in phylum–Porifera.
- Bilateral symmetry is the most common symmetry found in animals.
- Triploblastic animals like Platyhelminthes lack a coelom. Haemocoel is present in Mollusca and Arthropoda.

185 (*c*) Statements I, III and IV are correct. The incorrect statement II can be corrected as

Platyhelminthes exhibits organ level of organisation.

186 (*c*) Statement V is incorrect for sponges. It can be corrected as

Sexes are not separate in sponges. They are hermaphrodite, i.e. eggs and sperms are produced by the same individual.

Rest statements are correct.

188 (*a*) The animal given is *Hirudinaria* belonging to the phylum–Annelida. It is a triploblastic, bilaterally symmetrical coelomate. It shows metameric segmentation. It is monoecious animal without lateral appendages. It possesses closed circulatory system. Lateral appendages are possessed by *Nereis*.

189 (*b*) Statements I, II and IV are correct for starfish (*Asterias*) which belongs to the phylum–Echinodermata. Statement III is incorrect and can be corrected as

In starfish, digestive system is complete with mouth on the lower (ventral) side and anus on the upper (dorsal) side.

190 (*c*) Statements I and II are true for *Wuchereria* (Filarialworm) and statements III and IV are false. The correct form of the wrong statements are

In *Wuchereria*, as well as for all animals belonging to phylum–Aschelminthes, females are longer than males and they have an organ system level of organisation.

191 (*b*) Only statement II is correct. Rest of the statements are incorrect and can be corrected as

- Mollusca bear organ system level of organisation.
- Platyhelminthes are acoelomates.
- Ctenophores have radial symmetry.

192 (*c*) Both statements are true. Most arthropods, certain molluscs and tunicates have open circulatory system.

In them, a fluid bathes the internal-tissue and organs directly. It oozes through spaces or cavities that surround the organs. This fluid is usually referred to as haemolymph.

193 (*c*) Both statement I and II are true. Lancelet or *Branchiostoma* or *Amphioxus* (a jawless fish) is a protochordate. It belongs to group-Cephalochordata. The general characters of protochordates are the presence of dorsal tubular nerve cord, notochord and pharyngeal gill slits throughout their life.

194 (*c*) Both statement I and II are true. The members of sub-phylum–Vertebrata possess notochord during the embryonic period. The notochord is replaced by a cartilaginous or bony vertebral column in adults. Thus, all vertebrates are chordates, but all chordates are not vertebrates.

195 (*b*) Statements I, II and V are correct but III and IV are incorrect. The correct form of the false statements are

- Skin of amphibians is moist, but naked, i.e. scales are absent. Glands are present on their skin which keep it moist. This moist skin aids in respiration besides protection.
- Birds (Aves) are warm-blooded or homeothermic or endothermal tetrapods as the temperature of the body remains constant as compared to that of surrounding.

215 (*a*) The correct option is a

- **Porifera** – Fertilisation is internal with indirect development.
- **Ctenophora** – Fertilisation is external with indirect development.
- **Aschelminthes** – Fertilisation is internal with direct or indirect development.
- **Arthropoda** – Fertilisation is usually internal with direct or indirect development.
- **Echinodermata** – Fertilisation is usually external with indirect development.
- **Hemichordata** – Fertilisation external with indirect development.

217 (*b*) Metamerism is the pattern of segmentation in which the animal body is divided both externally and internally into segments with a serial repetition of at least some organs, e.g. in annelids (earthworm).

218 (*b*) Interstitial cells are the totipotent cells present in the body of cnidarians that are capable of giving rise to different kinds of specialised cells which perform different functions.

219 (*b*) Crocodiles, birds, mammals have a four-chambered heart. Heart is usually three-chambered in reptiles with the exception of crocodiles, which possess four-chambered heart. The division in their heart is due to the incomplete interventricular septum, in ventricles.

220 (*b*) *Chameleon* and turtle belong to the class–Reptilia and possess dry and non-glandular skin with scales.

221 (*d*) Warm-blooded body is the common characteristic feature in birds and mammals. Warm-blooded animals can maintain constant body temperature, irrespective of the surrounding environment, i.e. their body temperature is fixed.

222 (*c*) Monkey, chimpanzee and man belong to a single taxonomic group, i.e. mammals because all of them possess the following characters

(i) Milk producing mammary glands.
(ii) Two pairs of limbs.
(iii) The presence of external ears.
(iv) Viviparity.
(v) Skin possessing hairs.

223 (*c*) The statement, *Fasciola* is a pseudocoelomate animal, is incorrect as it does not possess body cavity and hence, is an acoelomate.

224 (*a*) The statement (a) is incorrect because Malpighian tubules are excretory structures in most of the insects, including cockroach, but green glands perform excretory functions in crustaceans like prawns.

225 (*c*) Except *Python*, all other mentioned snakes are highly poisonous in nature. *Python* is large in size and kills its prey by wrapping and constricting its body around its prey.

227 (*b*) When body cavity is not completely lined by the mesoderm and instead is present in the form of scattered pouches, in between ectoderm and endoderm, then this type of body cavity is called pseudocoelomate, e.g. roundworm.

229 (*a*) Platypus is a primitive mammal and shows many characters of its reptilian descent, such as oviparity, i.e. it lays eggs.

Rest all the three animals, i.e. flying fox, elephant and whale are viviparous mammals and give birth to young ones.