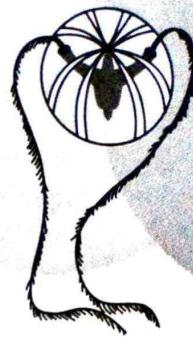


4 Animal Kingdom



4.1. Basis of Classification

1. Which of the following pairs is an incorrect match?

- Annelids and arthropods - Bilateral symmetry
- Sponges - Acoelomates
- Coelenterates and Ctenophores - Radial symmetry
- Platyhelminthes - Diploblastic organisation

[Re-NEET 2024]

2. Consider the following statements:

- Annelids are true coelomates.
- Poriferans are pseudocoelomates.
- Aschelminthes are acoelomates.
- Platyhelminthes are pseudocoelomates.

Choose the correct answer from the options given below:

- (I) only
- (III) only
- (IV) only
- (II) only

[NEET 2024]

3. The following are the statements about non-chordates:

- Pharynx is perforated by gill slits.
- Notochord is absent.
- Central nervous system is dorsal.
- Heart is dorsal if present.
- Post anal tail is absent.

Choose the most appropriate answer from the options given below:

- (I), (II) and (IV) only
- (II), (IV) and (V) only
- (II), (III) and (IV) only
- (I) and (III) only

[NEET 2024]

4. Consider the following features:

- Organ system level of organisation
- Bilateral symmetry
- True coelomates with segmentation of body

Select the correct option of animal groups which possess all the above characteristics.

- Annelida, Arthropoda and Mollusca
- Arthropoda, Mollusca and Chordata
- Annelida, Mollusca and Chordata
- Annelida, Arthropoda and Chordata

[NEET 2019]

5. Which of the following animals are true coelomates with bilateral symmetry?

- Adult Echinoderms
- Aschelminthes
- Platyhelminthes
- Annelids

[NEET Odisha 2019]

6. Which one of the following kinds of animals are triploblastic?

- Flatworms
- Sponges
- Ctenophores
- Corals

[AIPMT Screening 2010]

7. Which one of the following statements about certain given animals is correct?

- Roundworms (Aschelminthes) are pseudocoelomates.
- Molluscs are acoelomates.
- Insects are pseudocoelomates.
- Flatworms (Platyhelminthes) are coelomates.

[AIPMT Screening 2010]

8. Which one of the following groups of animals is bilaterally symmetrical and triploblastic?

- Coelenterates (cnidarians)
- Aschelminthes (roundworms)
- Ctenophores
- Sponges

[AIPMT Screening 2009]

9. Metameric segmentation is the characteristic of:

- mollusca and chordata
- platyhelminthes and arthropoda
- echinodermata and annelida
- annelida and arthropoda.

[AIPMT 2006]

10. The animals with bilateral symmetry in young stage, and radial pentamerous symmetry in the adult stage, belong to the phylum:

- Annelida
- Mollusca
- Cnidaria
- Echinodermata.

[AIPMT 2004]

11. Which of the following animals have scattered cells with cell-tissue grade organisation?

- Sponge
- Hydra
- Liver fluke
- Ascaris

[AIPMT 2000]

12. Coelom is found between:

- (A) body wall and ectoderm
- (B) ectoderm and endoderm
- (C) mesoderm and body wall (endoderm)
- (D) mesoderm and ectoderm

[AIPMT 1996]

Choose the correct answer from the options given below:

- (a) (b) (c) (d)
- (A) (ii) (i) (iv) (iii)
- (B) (iii) (iv) (i) (ii)
- (C) (iv) (iii) (ii) (i)
- (D) (i) (ii) (iii) (iv)

[NEET 2024]

4.2. Classification of Animals

13. Match List-I with List-II:

List-I	List-II
(a) Chondrichthyes	(i) <i>Clarias</i>
(b) Cyclostomata	(ii) <i>Carcharodon</i>
(c) Osteichthyes	(iii) <i>Myxine</i>
(d) Amphibia	(iv) <i>Ichthyophis</i>

Choose the correct answer from the options given below:

- (a) (b) (c) (d)
- (A) (ii) (iv) (i) (iii)
- (B) (i) (iii) (ii) (iv)
- (C) (ii) (iii) (i) (iv)
- (D) (i) (ii) (iii) (iv)

[Re-NEET 2024]

14. Open Circulatory system is present in:

- (A) *Palaemon, Nereis, Balanoglossus*
- (B) *Hirudinaria, Bombyx, Salpa*
- (C) *Anopheles, Limax, Limulus*
- (D) *Pheretima, Musca, Pila*

[Re-NEET 2024]

15. Given below are two statements: One is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A): Members of subphylum vertebrata possess notochord during the embryonic period. The notochord is replaced by a cartilaginous or bony vertebral column in the adult.

Reason (R): Thus all chordates are vertebrates but not all vertebrates are chordates.

In the light of the above statements, choose the correct answer from the options given below.

- (A) A is true but R is false.
- (B) A is false but R is true
- (C) Both A and R are true and R is the correct explanation of A.
- (D) Both A and R true but R is NOT the correct explanation of A.

[Re-NEET 2024]

17. Match List I with List II:

List I	List II
(a) <i>Pterophyllum</i>	(i) Hag fish
(b) <i>Myxine</i>	(ii) Saw fish
(c) <i>Pristis</i>	(iii) Angel fish
(d) <i>Exocoetus</i>	(iv) Flying fish

Choose the correct answer from the options given below:

- (a) (b) (c) (d)
- (A) (iii) (i) (ii) (iv)
- (B) (iv) (i) (ii) (iii)
- (C) (iii) (ii) (i) (iv)
- (D) (ii) (i) (iii) (iv)

[NEET 2024]

18. Radial symmetry is not found in adults of phylum

- (A) Coelenterata
- (B) Echinodermata
- (C) Ctenophora
- (D) Hemichordata

[NEET 2023]

19. Match List I with List II.

List I	List II
(a) <i>Taenia</i>	(i) Nephridia
(b) <i>Paramoecium</i>	(ii) Contractile vacuole
(c) <i>Periplaneta</i>	(iii) Flame cells
(d) <i>Pheretima</i>	(iv) Uricose gland

Choose the correct answer from the options given below:

- (a) (b) (c) (d)
- (A) (iii) (ii) (iv) (i)
- (B) (ii) (i) (iv) (iii)
- (C) (i) (ii) (iii) (iv)
- (D) (i) (ii) (iv) (iii)

[NEET 2023]

20. Select the correct statements with reference to chordates.

- (I) Presence of a mid-dorsal, solid and double nerve cord.
- (II) Presence of closed circulatory system.
- (III) Presence of paired pharyngeal gill slits.
- (IV) Presence of dorsal heart.
- (V) Triploblastic pseudocoelomate animals.

Choose the correct answer from the options given below:

- (A) (II), (IV) and (V) only
- (B) (III), (IV) and (V) only
- (C) (I), (III) and (IV) only
- (D) (II) and (III) only

[NEET 2023]

16. Match List I with List II:

List I	List II
(a) <i>Pleurobrachia</i>	(i) Mollusca
(b) <i>Radula</i>	(ii) Ctenophora
(c) <i>Stomochord</i>	(iii) Osteichthyes
(d) Air bladder	(iv) Hemichordata

21. Match List-I with List-II.

List-I		List-II	
(a)	Metamerism	(i)	Coelenterata
(b)	Canal system	(ii)	Ctenophora
(c)	Comb plates	(iii)	Annelida
(d)	Cnidoblasts	(iv)	Porifera

Choose the correct answer from the options given below.

(a) (b) (c) (d)
 (A) (iv) (iii) (i) (ii)
 (B) (iii) (iv) (i) (ii)
 (C) (iii) (iv) (ii) (i)
 (D) (iv) (i) (ii) (iii)

[NEET 2021]

22. Which one of the following organism bears hollow and pneumatic long bones?

(A) *Neophron* (B) *Hemidactylus*
 (C) *Macropus* (D) *Ornithorhynchus*

[NEET 2021]

23. Match List-I with List-II.

List-I		List-II	
(a)	<i>Physalia</i>	(i)	Pearl oyster
(b)	<i>Limulus</i>	(ii)	Portuguese Man of War
(c)	<i>Ancylostoma</i>	(iii)	Living fossil
(d)	<i>Pinctada</i>	(iv)	Hookworm

Choose the correct answer from the options given below.

(a) (b) (c) (d)
 (A) (ii) (iii) (i) (iv)
 (B) (iv) (i) (iii) (ii)
 (C) (ii) (iii) (iv) (i)
 (D) (i) (iv) (iii) (ii)

[NEET 2021]

24. Read the following statements.

(I) Metagenesis is observed in helminthes.
 (II) Echinoderms are triploblastic and coelomate animals.
 (III) Round worms have organ-system level of body organisation.
 (IV) Comb plates present in ctenophores help in digestion.
 (V) Water vascular system is characteristic of Echinoderms.

Choose the correct answer from the options given below.

(A) (III), (IV) and (V) are correct
 (B) (I), (II) and (III) are correct
 (C) (I), (IV) and (V) are correct
 (D) (II), (III) and (V) are correct

[NEET 2021]

25. Match the following columns and select the correct option from the codes given below.

Column I	Column II
(a) <i>Aptenodytes</i>	(i) Flying fox
(b) <i>Pteropus</i>	(ii) Angel fish
(c) <i>Pterophyllum</i>	(iii) Lamprey
(d) <i>Petromyzon</i>	(iv) Penguin

Select the correct option.

(a) (b) (c) (d)
 (A) (iii) (iv) (ii) (i)
 (B) (iii) (iv) (i) (ii)
 (C) (iv) (i) (ii) (iii)
 (D) (ii) (i) (iv) (iii)

[NEET Oct. 2020]

26. All vertebrates are chordates, but all chordates are not vertebrates, why?

(A) Notochord is replaced by vertebral column in adult of some chordates.
 (B) Ventral hollow nerve cord remains throughout life in some chordates.
 (C) All chordates possess vertebral column.
 (D) All chordates possess notochord throughout their life.

[NEET Oct. 2020]

27. Match the following columns and select the correct option.

Column I	Column II
(a) 6-15 pairs of gill slits	(i) <i>Trygon</i>
(b) Heterocercal caudal fin	(ii) Cyclostomes
(c) Air bladder	(iii) Chondrichthyes
(d) Poison sting	(iv) Osteichthyes

Select the correct option.

(a) (b) (c) (d)
 (A) (iii) (iv) (i) (ii)
 (B) (iv) (ii) (iii) (i)
 (C) (i) (iv) (iii) (ii)
 (D) (ii) (iii) (iv) (i)

[NEET Sept. 2020]

28. Match the following columns and select the correct option.

Column I	Column II
(a) Gregarious, polyphagous pest	(i) <i>Asterias</i>
(b) Adult with radial symmetry and larva with bilateral symmetry	(ii) Scorpion

(c) Book lungs	(iii) <i>Ctenoplana</i>
(d) Bioluminescence	(iv) <i>Locusta</i>

Select the correct option.

(a) (b) (c) (d)
 (A) (iv) (i) (ii) (iii)
 (B) (iii) (ii) (i) (iv)
 (C) (ii) (i) (iii) (iv)
 (D) (i) (iii) (ii) (iv)

[NEET Sept. 2020]

29. Match the following organisms with their respective characteristics.

Column I	Column II
(a) <i>Pila</i>	(i) Flame cells
(b) <i>Bombyx</i>	(ii) Comb plates
(c) <i>Pleurobrachia</i>	(iii) Radula
(d) <i>Taenia</i>	(iv) Malpighian tubules

Select the correct option from the following.

(a) (b) (c) (d)
 (A) (iii) (iv) (ii) (i)
 (B) (ii) (iv) (iii) (i)
 (C) (iii) (ii) (iv) (i)
 (D) (iii) (i) (i) (iv)

[NEET National 2019]

30. Match the following genera with their respective phylum.

Column I	Column II
(a) <i>Ophiura</i>	(i) Mollusca
(b) <i>Physalia</i>	(ii) Platyhelminthes
(c) <i>Pinctada</i>	(iii) Echinodermata
(d) <i>Planaria</i>	(iv) Coelenterata

Select the correct option from the following.

(a) (b) (c) (d)
 (A) (iv) (i) (iii) (ii)
 (B) (iii) (iv) (i) (ii)
 (C) (i) (iii) (iv) (ii)
 (D) (iii) (iv) (ii) (i)

[NEET Odisha 2019]

31. Identify the vertebrate group of animals characterised by crop and gizzard in its digestive system.

(A) Aves (B) Reptilia
 (C) Amphibia (D) Osteichthyes

[NEET 2018]

32. Which one of these animals is not a homeotherm?

(A) *Camelus* (B) *Chelone*
 (C) *Macropus* (D) *Psittacula*

[NEET 2018]

33. Which one of the following animals does not undergo metamorphosis?

(A) Moth (B) Tunicate
 (C) Earthworm (D) Starfish

[NEET 2018]

34. An important characteristic that hemichordates share with chordates is:

(A) absence of notochord
 (B) ventral tubular nerve cord
 (C) pharynx with gill slits
 (D) pharynx without gill slits.

[NEET 2017]

35. 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 2017]

36. In case of poriferans, the spongocoel is lined with flagellated cells called:

(A) ostia (B) oscula
 (C) choanocytes (D) mesenchymal cells.

[NEET 2017]

37. Which of the following characteristic features always holds true for the corresponding group of animals?

(A) Viviparous	Mammalia
(B) Possess a mouth with an upper and a lower jaw	Chordata
(C) 3-chambered heart with one incompletely divided ventricle	Reptilia
(D) Cartilaginous endoskeleton	Chondrichthyes

[NEET Phase-I 2016]

38. Which one of the following characteristics is not shared by birds and mammals?

(A) Breathing using lungs
 (B) Viviparity
 (C) Warm blooded nature
 (D) Ossified endoskeleton

[NEET Phase-I 2016]

39. Which of the following features is not present in the Phylum Arthropoda?

(A) Metameric segmentation
 (B) Parapodia
 (C) Jointed appendages
 (D) Chitinous exoskeleton

[NEET Phase-I 2016]

40. A jawless fish, which lays eggs in fresh water and whose ammocoete larvae after metamorphosis return to the ocean is:

(A) *Eptatretus* (B) *Myxine*
 (C) *Neomyxine* (D) *Petromyzon*.

[AIPMT Latest July 2015]

41. Body having meshwork of cells, internal cavities lined with food filtering flagellated cells and indirect development are the characteristics of Phylum:

(A) Coelenterata (B) Porifera
(C) Mollusca (D) Protozoa

[AIPMT Latest July 2015]

42. Which of the following characteristics is mainly responsible for diversification of insects on land?

(A) Segmentation (B) Bilateral symmetry
(C) Exoskeleton (D) Eyes

[AIPMT Cancelled 2015]

43. Which of the following represents the correct combination without any exception?

Characteristic	Class
(A) Mammary gland, hair on body; pinnae; two pairs of limbs	(I) Mammalia
(B) Mouth ventral, gills without operculum, skin with placoid scales; persistent notochord	(II) Chondrichthyes
(C) Sucking and circular mouth, jaws absent integument without scales, paired appendages	(III) Cyclostomata
(D) Body covered with feathers; skin moist and glandular; lungs with air sacs forelimbs form wings	(IV) Aves

[AIPMT Cancelled 2015]

44. Which of the following animals is not viviparous?

(A) Flying fox (bat) (B) Elephant
(C) Platypus (D) Whale

[AIPMT Cancelled 2015]

45. Select the taxon mentioned that represents both marine and freshwater species:

(A) Echinoderms (B) Ctenophora
(C) Cephalochordata (D) Cnidaria [AIPMT 2014]

46. Which one of the following living organisms completely lacks a cell wall?

(A) Cyanobacteria (B) Sea-fan (*Gorgonia*)
(C) *Saccharomyces* (D) Blue-green algae

[AIPMT 2014]

47. *Planaria* possess high capacity of:

(A) metamorphosis
(B) regeneration
(C) alternation of generation
(D) bioluminescence. [AIPMT 2014]

48. A marine cartilaginous fish that can produce electric current is:

(A) *Pristis* (B) *Torpedo*
(C) *Trygon* (D) *Scoliodon*. [AIPMT 2014]

49. Identify the animal which is correctly marked (Column I) with one characteristics (Column II) and the phylum/ class (Column III) to which it belongs.

	Column I	Column II	Column III
(A)	<i>Petromyzon</i>	Ectoparasite	Cyclostomata
(B)	<i>Ichthyophis</i>	Terrestrial	Reptilia
(C)	<i>Limulus</i>	Body covered by chitinous exoskeleton	Pisces
(D)	<i>Adamsia</i>	Radially symmetrical	Porifera

[NEET 2013]

50. Which of the following are correctly matched with respect to their taxonomic classification?

(A) Flying fish, cuttlefish, silverfish-Pisces
(B) Centipede, millipede, spider, scorpion-Insecta
(C) Housefly, butterfly, tse-tse fly, silverfish-Insecta
(D) Spiny anteater, sea urchin, sea cucumber-Echinodermata

[NEET 2013]

51. Which group of animals belong to the same phylum?

(A) Malarial parasite, *Amoeba*, mosquito
(B) Earthworm, pinworm, tapeworm
(C) Prawn, scorpion, *Locusta*
(D) Sponge, sea anemone, starfish

[NEET 2013]

52. One of the representative of Phylum Arthropoda is:

(A) cuttlefish (B) silverfish
(C) pufferfish (D) flying fish [NEET 2013]

53. Which one of the following groups of animals reproduces only by sexual means?

(A) Cnidaria (B) Porifera
(C) Protozoa (D) Ctenophora

[NEET Karnataka 2013]

54. Which one of the following animals is correctly matched with its one characteristic and the taxon?

	Animal	Characteristic	Taxon
(A)	Millipede	Ventral nerve cord	Arachnida
(B)	Sea anemone	Triploblastic	Cnidaria
(C)	Silverfish	Pectoral and pelvic fins	Chordata
(D)	Duckbilled platypus	Oviparous	Mammalia

[NEET Karnataka 2013]

55. Sharks and dogfishes differ from skates and rays because:
 (A) gill slits are ventrally placed
 (B) head and trunk are widened considerably
 (C) distinct demarcation between body and tail
 (D) their pectoral fins distinctly marked off from cylindrical bodies. [NEET Karnataka 2013]

56. 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?

	Genus Name	Two characters	Phylum
(A)	<i>Pila</i>	(i) Body segmented (ii) Mouth with Radula	Mollusca
(B)	<i>Asterias</i>	(i) Spiny skinned (ii) Water vascular system	Echinodermata
(C)	<i>Sycon</i>	(i) Pore bearing (ii) Canal system	Porifera
(D)	<i>Periplaneta</i>	(i) Jointed appendages (ii) Chitinous exoskeleton	Arthropoda

[AIPMT Screening 2012]

57. 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) [AIPMT Mains 2012]

58. Which one of the following categories of animals, is correctly described with no single 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. [AIPMT Mains 2012]

59. What will you look for to identify the sex of the following?
 (A) Male frog - a copulatory pad on the first digit of the hind limb
 (B) Female cockroach - anal cerci
 (C) Male shark - claspers borne on pelvic fins
 (D) Female *Ascaris* - sharply curved posterior end. [AIPMT Screening 2011]

60. Which one of the following statements is totally wrong about the occurrence of notochord, while the other three are correct?
 (A) It is present only in larval tail in Ascidiants.
 (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*. [AIPMT Mains 2011]

61. Which one of the following statements about all the four of *Spongilla*, leech, dolphin and penguin is correct?
 (A) Penguin is homiothermic while the remaining three are poikilothermic.
 (B) Leech is a fresh water form while all others are marine.
 (C) *Spongilla* has special collared cells called choanocytes, not found in the remaining three.
 (D) All are bilaterally symmetrical. [AIPMT Screening 2010]

62. In which one of the following organism, its excretory organs are correctly stated?
 (A) Humans — Kidneys, sebaceous glands and tear glands
 (B) Earthworm — Pharyngeal, integumentary and septal nephridia
 (C) Cockroach — Malpighian tubules and enteric caeca
 (D) Frog — Kidneys, skin and buccal epithelium [AIPMT Mains 2010]

63. Which one of the following in birds, indicates their reptilian ancestry?
 (A) Scales on their hind limbs
 (B) Four chambered heart
 (C) Two special chambers crop and gizzard in their digestive tract
 (D) Eggs with a calcareous shell [AIPMT Screening 2008]

64. Which one of the following is not a characteristic of phylum Annelida?
 (A) Closed circulatory system
 (B) Segmentation
 (C) Pseudocoelom
 (D) Ventral nerve cord [AIPMT Screening 2008]

65. Which one of the following phyla is correctly matched with its two general characteristics?
 (A) Arthropoda — Body divided into head, thorax and abdomen and respiration by tracheae

- (B) Chordata — Notochord at some stage and separate anal and urinary openings to the outside
- (C) Echinodermata — Pentamerous radial symmetry and mostly internal fertilisation
- (D) Mollusca — Normally oviparous and development through a trophophore or veliger larva

[AIPMT Screening 2008]

66. What is common between parrot, platypus and kangaroo?

- (A) Toothless jaws (B) Functional post-anal tail
- (C) Oviparity (D) Homeothermy

[AIPMT 2007]

67. Which one of the following is a matching pair of a body feature and the animal possessing it?

- (A) Ventral central nervous system — Leech
- (B) Pharyngeal gill slits — *Chameleon* absent in embryo
- (C) Ventral heart — Scorpion
- (D) Post-anal tail — *Octopus*

[AIPMT 2007]

68. Which of the following pairs are correctly matched?

Animals	Morphological features
(I) Crocodile	— 4-chambered heart
(II) Sea urchin	— Parapodia
(III) <i>Obelia</i>	— Metagenesis
(IV) Lemur	— Thecodont
Options:	
(A) (II), (III) and (IV)	(B) Only (I) and (IV)
(C) Only (I) and (II)	(D) (I), (III) and (IV)

[AIPMT 2007]

69. Which one of the following is a matching set of a phylum and its three examples?

- (A) Porifera- *Spongilla, Euplectella, Pennatula*
- (B) Cnidaria - *Bonellia, Physalia, Aurelia*
- (C) Platyhelminthes - *Planaria, Schistosoma, Enterobius*
- (D) Mollusca - *Loligo, Teredo, Octopus*

[AIPMT 2006]

70. In which one of the following sets of animals do all the four give birth to young ones?

- (A) Kangaroo, hedgehog, dolphin, *Loris*
- (B) Lion, bat, whale, ostrich
- (C) Platypus, penguin, bat, hippopotamus
- (D) Shrew, bat, cat, kiwi

[AIPMT 2006]

71. Two common characters found in centipede, cockroach and crab are:

- (A) book lungs and antennae
- (B) compound eyes and anal cerci
- (C) jointed legs and chitinous exoskeleton
- (D) green gland and tracheae.

[AIPMT 2006]

72. Biradial symmetry and lack of cnidoblasts are the characteristics of:

- (A) *Hydra* and starfish
- (B) Starfish and sea anemone
- (C) *Ctenoplana* and *Beroe*
- (D) *Aurelia* and *Paramecium*

[AIPMT 2006]

73. Which one of the following characters is not typical of the Class Mammalia?

- (A) Thecodont dentition
- (B) Alveolar lungs
- (C) Ten pairs of cranial nerves
- (D) Seven cervical vertebrae

[AIPMT 2005]

74. In contrast to Annelids, the Platyhelminthes show:

- (A) absence of body cavity
- (B) bilateral symmetry
- (C) radial symmetry
- (D) presence of pseudocoel.

[AIPMT 2005]

75. Which one of the following is a very unique feature of the mammalian body?

- (A) Homeothermy
- (B) Presence of diaphragm
- (C) Four chambered heart
- (D) Rib cage

[AIPMT 2004]

76. In arthropoda, head and thorax are often used to form cephalothorax, but in which one of the following classes, is the body divided into head, thorax and abdomen?

- (A) Insecta
- (B) Myriapoda
- (C) Crustacea
- (D) Arachnida and crustacea.

[AIPMT 2004]

77. Presence of gills in the tadpole of frog indicates that:

- (A) fishes were amphibious in the past
- (B) fishes evolved from frog-like ancestors
- (C) frogs will have gills in future
- (D) frogs evolved from gilled ancestors.

[AIPMT 2004]

78. Given below are four matchings of an animal and its kind of respiratory organ.

(I) Silver fish	— Trachea
(II) Scorpion	— Book lung
(III) Sea squirt	— Pharyngeal gills
(IV) Dolphin	— Skin

The correct matchings are:

- (A) (I) and (II)
- (B) (I), (II) and (III)
- (C) (II) and (IV)
- (D) (III) and (IV)

[AIPMT 2003]

79. Which one of the following is a matching pair of an animal and a certain phenomenon it exhibits?

- (A) *Pheretima* — Sexual dimorphism
- (B) *Musca* — Complete metamorphosis

(C) *Chameleon* — Mimicry
 (D) *Taenia* — Polymorphism [AIPMT 2003]

80. During the life-cycle, *Fasciola hepatica* (liver fluke) infects its intermediate host and primary host at the following larval stage respectively:
 (A) redia and miracidium
 (B) cercaria and redia
 (C) metacercaria and cercaria
 (D) miracidium and metacercaria. [AIPMT 2003]

81. *Sycon* belongs to a group of animals, which are best described as:
 (A) unicellular or acellular
 (B) multicellular without any tissue organization
 (C) multicellular with a gastrovascular system
 (D) multicellular having tissue organization, but no body cavity. [AIPMT 2003]

82. In which of the following animals post anal tail is found?
 (A) Earthworm (B) Lower invertebrates
 (C) Scorpion (D) Snake [AIPMT 2001]

83. Similarity in *Ascaris lumbricoides* and *Anopheles stephensi* is:
 (A) sexual dimorphism (B) metamerism
 (C) anaerobic respiration (D) endoparasitism [AIPMT 2000]

84. The organisms attached to the substratum, generally, possess:
 (A) one single opening of the digestive canal
 (B) cilia on the surface to create water current
 (C) radial symmetry
 (D) asymmetrical body. [AIPMT 1995]

85. Aristotle's lantern occurs in Class:
 (A) Echinoidea (B) Asteroidea
 (C) Holothuroidea (D) Ophiuroidea

86. Eye of the molluscan group that resembles vertebrate eye is:
 (A) bivalvia (B) gastropoda
 (C) pelecypoda (D) cephalopoda [AIPMT 1992]

87. An insect regarded as greatest mechanical carrier of diseases is:
 (A) *Pediculus* (B) *Cimex*
 (C) *Musca* (D) *Xenopsylla*. [AIPMT 1991]

88. Bladderworm/cysticercus is the larval stage of:
 (A) tapeworm (B) roundworm
 (C) pinworm (D) liver fluke. [AIPMT 1991]

89. *Taenia saginata* differs from *Taenia solium* in:
 (A) absence of scolex hooks
 (B) absence of scolex hooks and uterine branching
 (C) absence of scolex hooks and presence of both male and female reproductive organs
 (D) presence of scolex hooks. [AIPMT 1990]

90. Wish bone of birds is from:
 (A) pelvic girdle (B) skull
 (C) hind limbs (D) pectoral girdle/clavicles. [AIPMT 1989]

91. Transfer of *Taenia* to secondary host occurs as:
 (A) oncosphere (B) cysticercus
 (C) morula (D) egg. [AIPMT 1989]

92. Both male and female pigeons secrete milk through:
 (A) salivary glands (B) modified sweat gland
 (C) crop (D) gizzard [AIPMT 1988]

93. Hair occur in all mammals excepts those:
 (A) Rodentia (B) Chiroptera
 (C) Primata (D) Cetacea. [AIPMT 1988]

SOLUTIONS

1. (D) Annelids and arthropods exhibit bilateral symmetry. Sponges are acelomates (lacking a true coelom). Coelenterates and ctenophores exhibit radial symmetry. Platyhelminthes have a triploblastic organisation (three germ layers: ectoderm, mesoderm, and endoderm), not diploblastic.

2. (A) Annelids are coelomate animals in which body cavity is lined by mesoderm called coelom. Aschelminthes are pseudocoelomate animals in which body cavity is not lined by mesoderm, instead, the mesoderm is present as scattered pouches in between the ectoderm and endoderm.

Poriferans and platyhelminthes are acelomate animals in which the body cavity is absent.

3. (B) In non-chordates, the notochord is absent. The central nervous system (CNS) is ventral, solid and double. Gill slits are absent in non-chordates, and the heart is located on the dorsal side (if present). Post-anal tail is also absent in these organisms.

4. (D) Phylum Annelida, Arthropoda and Chordata show characteristics of organ system level of organisation, bilateral symmetry and true coelom with segmented body. Mollusca are bilaterally symmetrical, true coelomates with organ system level of organisation but do not possess segmented body.



Caution

→ Students might get confused with option (A) as *Mollusca* bears all the characteristics except segmentation.

5. (D) Annelids are segmented, true coelomates, with bilateral symmetry. Adult echinoderms are true coelomates, with radial symmetry. Platyhelminthes are acoelomates with bilateral symmetry. Aschelminthes are segmented, pseudocoelomates with bilateral symmetry.



Caution

→ Students should know that larval echinoderms have bilateral symmetry, while adult echinoderms have radial symmetry.

6. (A) Flatworms are triploblastic and acoelomate. Whereas, sponges have a cell-aggregate type of body plan, ctenophores and corals are diploblastic.

7. (A) Roundworms (Aschelminthes) are pseudocoelomate. Whereas flatworms are acoelomate, molluscs and insects are coelomate.

8. (B) Aschelminthes are bilaterally symmetrical and triploblastic animals, e.g., *Ascaris*. Coelenterates are radially symmetrical and diploblastic animals, e.g., *Obelia*. Ctenophores are biradially symmetrical and diploblastic animals, e.g., *Ctenoplana*. Sponges are asymmetrical or radially symmetrical and diploblastic animals, e.g., *Sycon*.

9. (D) Metameric segmentation is the characteristic of phylum Annelida and Arthropoda. It is true segmentation in which external segmentation corresponds to the internal segmentation and the body is divided into a number of segments.

10. (D) In echinoderms, larval forms possess bilateral symmetry, while adults have radial symmetry. Molluscs possess bilateral symmetry. Cnidarians have bilateral and radial symmetry. Annelids have bilateral symmetry.



Related Theory

→ Class Gastropods (*Mollusca*) are characterised by their asymmetric body plan, which develops through a process called torsion (rotation of visceral organs in anticlockwise direction through an angle of 180° on the rest of the body during larval development).

11. (B) Sponges have cellular level of organisation, while liver fluke and *Ascaris* have organ-system level of organisation. *Hydra* has tissue level of organisation. It also has the cells that occur in two distinct layers or tissue of specialised cells.

12. (C) Coelom is a body cavity that arises in the embryonic mesoderm. It is the space between body wall (endoderm) and the mesoderm. The animals which possess true coelom are called eucoelomates.

13. (C) *Myxine* (Hagfish), a class of cartilaginous fishes belongs to Class Cyclostomata. *Carcharodon* (Great white shark), a class of cartilaginous fishes

belongs to Class Chondrichthyes. *Clarias* (Magur), class of bony fishes belongs to Class Osteichthyes, *Ichthyophis* (Limbless amphibia) belongs to Class Amphibia.

14. (C) The open circulatory system is found in certain invertebrates, where blood is not entirely contained within vessels. *Palaemon*, *Bombyx*, *Anopheles*, *Limulus*, *Musca* (Phylum Arthropoda) has an open circulatory system. *Nereis*, *Hirudinaria*, *Pheretima* (Phylum Annelida) has a closed circulatory system. *Balanoglossus* (Phylum Hemichordata) has an open circulatory system. *Salpa* (Phylum Chordata, Subphyla Urochordata) has a closed circulatory system. *Limax*, *Pila* (Phylum Mollusca) has an open circulatory system.

15. (A) In members of subphylum vertebrata, the notochord present during the embryonic stage is replaced by the vertebral column in the adult. Therefore, while all vertebrates are chordates, not every chordate is a vertebrate.

16. (A) *Pleurobrachia* belongs to phylum Ctenophora. The mouth of molluscs contains a rasping organ for feeding, called radula. Hemichordates have a rudimentary structure in the collar region called stomochord, a structure similar to notochord. Air bladder is present in animals belonging to class Osteichthyes of subphylum Vertebrata, which regulates buoyancy.

17. (A) *Pterophyllum* is the scientific name for angel fish. *Myxine* is the scientific name for hag fish. *Pristis* is the scientific name for saw fish. *Exocoetus* is the scientific name for flying fish.

18. (D) Radial symmetry is found in the adults of phyla Coelenterata (Cnidaria), Ctenophora, and Echinodermata, but not in Hemichordata. Hemichordata exhibits bilateral symmetry.



Mnemonics

→ Symmetry in Hemichordata can be memorised as:

Hemoglo Bin

↓ L → Bilateral symmetry
Hemichordata

19. (A) *Taenia* is a tapeworm, which is a parasitic flatworm lacking a digestive system. Flame cells are excretory structures in flatworms that help in osmoregulation and removal of metabolic waste. *Taenia* being a flatworm has flame cells for excretion.

Paramoecium is a unicellular eukaryotic organism that lives in fresh water. It has a contractile vacuole that helps in osmoregulation and removal of excess water from the cell.

Periplaneta is a cockroach that has uricose gland for excretion of nitrogenous waste. Uricose glands are found in insects and other arthropods.

Pheretima is an earthworm that has nephridia for excretion of nitrogenous waste. Nephridia are excretory structures in annelids that help in osmoregulation and removal of metabolic waste.

20. (D) Chordates have a mid-dorsal, hollow and single nerve cord.

They have a ventral heart, but not all chordates have a heart (e.g., tunicates) and are triploblastic coelomate animals.

21. (C) Metamerism is a body type exhibited by members of the phylum Annelida.

Canal system is the water circulatory system, which is the characteristic feature of the phylum Porifera.

Comb plates are large ciliary structures seen in Ctenophora and helps in locomotion.

Cnidoblasts are the distinctive feature of the phylum Coelenthrata.

22. (A) Pneumatic bones are those bones, which contain an air filled cavity within them. These bones are hollow and are found in the members of the class Aves. For example, *Neophron* (Egyptian vulture).

Related Theory

→ A hollow medullary cavity is found in the center of long bones and serves as a storage area for bone marrow.

23. (C) *Physalia* – Portuguese Man of War

Limulus – Living fossil

Ancylostoma – Hookworm

Pinctada – Pearl oyster

24. (D) Metagenesis is seen in *Obelia*. The tentacles of Ctenophores have transversely arranged meridional bands, i.e., comb-like eight ciliary plates (comb plates) on their body for locomotion.

Related Theory

→ Acoelomates are *Porifera*, *Coelenterata* and *Flatworms* (*Platyhelminthes*); Pseudocoelomates are *Roundworms* (*Aschelminthes*); Coelomates includes phylum *Annelida* to *Chordata*.

25. (C) *Aptenodytes* is a penguin. *Pteropus* is a flying fox. *Pterophyllum* is an angel fish. *Petromyzon* is a lamprey.

26. (A) All chordates have a notochord. Chordates include protochordates and vertebrates. In vertebrates, notochord is replaced by a vertebral column (backbone) during adult stage, however vertebral column is not present in protochordates. Therefore, all vertebrates are chordates, but all chordates are not vertebrates.

Related Theory

→ Chordates are the animals that possess notochord (a stiff, supporting rod like structure present on the dorsal side) at some stage of their lives. Phylum Chordata is divided into three Subphyla:

Urochordata or *Tunicata*, *Cephalochordata* and *Vertebrata*. Subphyla *Urochordata* and *Cephalochordata* are often referred to as protochordates and are exclusively marine. In *Urochordata*, notochord is present only in tail of larva and disappears in adults, while in *Cephalochordata*, it extends from head to tail region and persists throughout the life.

→ The members of Subphylum *Vertebrata* possess a notochord during the embryonic period which is replaced by a cartilaginous or bony vertebral column in the adult. Thus, all vertebrates are chordates but all chordates are not vertebrates.

27. (D) Cyclostomes have an elongated body bearing 6-15 pairs of gills slits for respiration. Air bladder is present in bony fishes belonging to the class Osteichthyes, which regulates buoyancy. *Trygon* is a cartilaginous fish possessing poison sting. Heterocercal caudal fin is present in the members of class Chondrichthyes.

28. (A) *Locusta* is a gregarious pest. In Echinoderms (*Asterias*), adults are radially symmetrical but larva are biradially symmetrical. Scorpion respire through book lungs. Bioluminescence is well marked in ctenophores (*Ctenoplana*).

29. (A) *Pila* or apple snail contains file-like rasping organ called radula for feeding. *Bombyx* or silkworm is an arthropod in which excretion occurs through Malpighian tubules. The body of *Pleurobrachia* bears eight rows of ciliated comb plates, which help in locomotion. In *Taenia*, excretion occurs through specialised cells called flame cells, which contain a protonephridia.

30. (B) *Ophiura* (brittle star) is a member of Echinodermata. *Physalia* (Portuguese Man of War) is a member of Coelenterata. *Pinctada* (Pearl oyster) is a mollusc. *Planaria* (Flatworm) is a Platyhelminthes.

31. (A) Crop and gizzard are found in the digestive tract of birds. Crop helps in the storage and softening of food, while gizzard helps in crushing and churning.

Related Theory

→ Birds mouth do not have teeth and so their digestive system process unmasticated food. The stomach of birds has two chambers: the proventriculus, where gastric juices are produced to digest the food before it enters the stomach, and the gizzard, where the food is stored, soaked, and mechanically ground. Some birds swallow stones or grit, which are stored in the gizzard, to aid the grinding process. The undigested material forms food pellets that are sometimes regurgitated. Most of the chemical digestion and absorption happens in the intestine and the waste is excreted through the cloaca.

32. (B) *Chelone* is a green sea turtle, which is reptilian. All reptilians are ectotherms or cold-blooded animals, i.e., their internal body temperature varies with the surroundings. *Camelus* (camel), and *Macropus* (kangaroo) are mammals, while *Psittacula* (parrot) is a bird, which is homeotherm, i.e., it can maintain its body temperature irrespective to surroundings.



Caution

→ Students choose wrong options as they cannot remember the scientific and common names of animals.

33. (C) Earthworm exhibit direct development, where no larval stage is involved. Moths, tunicates and starfish show metamorphosis. Larva of moth is caterpillar, larva of tunicate is tadpole, and larva of starfish is bipinnaria larva.



Related Theory

→ Metamorphosis is a rapid and complete transformation from an immature larval stage to a sexually adult form involving morphology, function and habitat changes. Ecdysis or moulting is the periodic shedding off the old exoskeleton. The duration of the period between two successive moults of a developing insect is called stadium. The form of the developing insect between two moults is called instar. A larva is a motile, immature feeding stage, which is morphologically different from the adult stage. The larvae of hemimetabolous insects are called nymphs. The adult stage of holometabolous insects is called imago.

34. (C) The important characteristic that hemichordate share with chordates is pharynx with gill slits. These gill slits are narrow openings in pharynx and the position is lateral in chordates and dorsal in hemichordates.



Related Theory

→ Both hemichordates and chordates belong to a common ancestor, are deuterostomes, triploblastic, coelomates, possess bilateral symmetry, have a dorsal tubular nerve cord, exhibit an organ-system level of organisation and contain pharyngeal gill slits. However, hemichordates lack segmentation as opposed to chordates. The body division of hemichordates is different from that of chordates, especially in having a proboscis. Hemichordate animals possess an epidermal nervous system, while chordate animals possess a central nervous system.

35. (C) Whale (*Balaenoptera*), Dolphins (*Delphinus*), Seals (*Pinnipedia*) are all aquatic mammals. Sharks (*Carcharodon*) and Sting ray (*Trygon*) are cartilaginous fishes.

36. (C) Choanoderm is the inner cellular layer, lining the spongocoel in poriferans consisting of flagellated cells, choanocytes. Ostia are small pores that connect the outer environment to spongocoel. Oscula is the large aperture in a sponge through which water is expelled. Mesenchyme, also known as mesohyl in sponges, is a gelatinous matrix that contains skeletal elements and archaeocytes (or amoebocytes).



Related Theory

→ Sponges are filter feeders. They pump water into their body through their ostia into the spongocoel. As the water flows by, specialised collar cells, choanocytes filter out food particles such as bacteria. Collar cells have tiny hairs that trap the particles. They also have a flagellum that whips the water

and keeps it moving. Once the food is trapped, the collar cells digest it. Cells called amebocytes also help digest the food. Finally, the water flows back out of the body through an opening called the osculum.

37. (D) Chondrichthyes are fish, which have cartilaginous endoskeleton. Reptiles have three chambered heart, except crocodiles. Mammals are viviparous except prototherians. Chordates possess jaws, except protochordates and cyclostomes.



Related Theory

→ Characters of Chondrichthyes: Mostly marine, cartilaginous endoskeleton, skin with minute placoid scales, gill-slits not covered with operculum, mouth and 2 nostrils ventral and males with claspers.



Caution

→ Students might get confused in all the four options A, B, C and D as it is sometimes become difficult for them to recall exceptions.

38. (B) Mammals are viviparous, i.e., young one is developed inside the parent body, while birds are oviparous, i.e., parent lay eggs, in which young ones develop.



Related Theory

→ Differences between aves and mammals

Aves	Mammalia
The body is covered with feathers.	Their body is covered by skin with hair.
The forelimbs are modified for flight.	The forelimbs are modified for climbing or for some other purposes.
Mammary glands are absent.	Mammary glands are present. These produce milk to feed their young ones.

39. (B) Parapodia are locomotory organs present in Phylum Annelida, e.g., *Nereis*, which help in swimming. The characteristic feature of Arthropoda is presence of jointed legs. They show metameric segmentation and have chitinous exoskeleton.

40. (D) *Petromyzon* (lamprey) belongs the Class Agnatha of the Subphylum Vertebrata. They have long, greenish brown, cylindrical body with smooth scaleless slimy skin. They lay eggs in freshwater, but their larvae ammocoetes return to ocean after metamorphosis.



Related Theory

→ Some of the characteristics of Agnatha are:

- (1) Jaws are absent.
- (2) Paired fins are generally absent.
- (3) Early species had heavy bony scales and plates in their skin, but these are not present in living species.
- (4) In most cases the skeleton is cartilaginous.
- (5) The embryonic notochord persists in the adult.
- (6) Seven or more paired gill pouches are present.

41. (B) Phylum Porifera comprises sponges, which are generally, marine, sessile, radially symmetrical or asymmetrical animals. This phylum has characteristic feature of canal system. The perforation of body surface by numerous apertures for the ingress and egress of water current, collectively forms the canal system. Sponges have a central body cavity known as spongocoel, which is lined by specialised flagellated cells called choanocytes or collar cells.

Related Theory

→ All the body cavities traversed by water currents, nourishing the sponge from the time it enters by the pores until it passes out by the osculum, are collectively referred to as canal system. Asconoid Canal System is the simplest type of canal system. The route followed by the water currents is ostia, spongocoel and osculum. Syconoid Canal System is slightly complicated and advanced than asconoid. It includes the incurrent canals with epidermal lining formed between radial canals. Leuconoid Canal System is the complex type of canal system. It includes the radial canals folded to form flagellated chambers which lead into excurrent canals that either open into spongocoel or outside through osculum.

42. (C) Chitinous exoskeleton is the characteristics of insects which helps in its diversification and adaptation with respect to land habitat. Segmentation, bilateral symmetry and presence of eye are also characteristics of insects, but they are not distinguishable characteristics.

Related Theory

→ An insect's exoskeleton (integument) serves not only as a protective covering over the body, but also as a surface for muscle attachment, a water-tight barrier against desiccation, and a sensory interface with the environment. It is a multi-layered structure with four functional regions: epicuticle, procuticle, epidermis, and basement membrane.

43. (B) Cyclostomata body is devoid of scales and paired fins. Aves skin is neither moist nor glandular. Chondrichthyes members have gills without operculum. Protherian mammals lack ear pinna and aquatic mammals lack hind limbs.

44. (C) Platypus is a prototherian, i.e., oviparous in nature. Rest of the mammals are (eutherian), i.e., viviparous.

Related Theory

→ Viviparous animals give birth to young ones that have been nourished in close contact with their mothers' bodies. Viviparity has had a major role in shaping mammalian evolution as characterised by invasive placentation, maintenance of body temperature (homeothermy), milk production and enlargement of the brain (encephalization) relative to body size.

45. (D) Cnidarians (or Coelenterates) are found in both freshwater (e.g., *Hydra*) and marine waters (e.g.,

jellyfish, sea anemone), while the members of Ctenophora (e.g., sea walnuts, sea gooseberries), Cephalochordata (e.g., lancelets) and Echinodermata (e.g., sea urchin, starfish) are exclusively marine.

Related Theory

→ Coelenterates are called Cnidarians because they contain specialised cells called cnidoblasts. They possess stinging structures called nematocysts.

46. (B) Animal cells lack cell wall completely. Sea-fan (*Gorgia*) is a Cnidarian animal. Cyanobacteria is a blue green alga belonging to the Kingdom Monera. The cell wall is composed of chitin. *Saccharomyces* (yeast) is a fungus, having cell wall of chitin.

47. (B) *Planaria* is a Platyhelminthes showing high degree of regeneration capacity in tissues at the site of wound, which proliferate to form blastema, and remodelling of pre-existing tissue occurs to restore the symmetry and proportion of the cells and body with the help of neoblast cells.

Caution

→ Students should remember that regeneration is not same as reproduction because regeneration is only a type of asexual reproduction, while reproduction can be sexual or asexual. Regeneration is the process by which an animal restores a lost part of its body which include wound healing, tissue repair, and many kinds of restorative activities.

48. (B) *Torpedo* is a cartilaginous fish, which produce electric current via electric organs (modified lateral muscle plates, with cranial nerves). *Trygon* is a sting ray, which resembles electric ray but it is devoid of any electricity producing organs. *Scoliodon* is a dogfish having great sense of smell. *Pristis* is a saw fish as its sharp transverse teeth resembles a saw.

Related Theory

→ Cartilaginous fish have skeletons composed mostly of cartilage, while bony fishes have a skeleton composed mostly of bone. Cartilaginous fish are grouped under the class Chondrichthyes and all bony fishes fall under the Superclass Osteichthyes.

49. (A) *Petromyzon* (lamprey) belongs to class Cyclostomata and is an ectoparasite on fish. *Ichthyophis* is a limbless amphibian. *Limulus* (king crab) is a living fossil from Arthropoda. *Adamsia* is a coelenterate with radially symmetrical body.

50. (C) Housefly, butterfly, tse-tse fly, silverfish belong to Class Insecta of Phylum Arthropoda. Flying fish is Osteichthyes (Pisces), cuttlefish (*Sepia*) belongs to Phylum Mollusca. Sea urchin and sea cucumber are the members of Echinodermata. Spider and scorpion belong to Arachnida (Arthropoda). Centipede belongs to Class Chilopoda (Arthropoda). Millipede belongs to Class Diplopoda (Arthropoda). Spiny anteater is a mammal.

51. (C) Prawn, Scorpion, *Locusta* and Mosquito belong to Phylum Arthropoda. Malarial parasite (*Plasmodium vivax*) and *Amoeba* belong to Phylum Protozoa.

Earthworm-Phylum Annelida, Pinworm and Tapeworm-Phylum Aschelminthes, Sponges-Phylum Porifera, Sea anemone-Phylum Coelenterate, Starfish-Phylum Echinodermata.

52. (B) Silverfish is an arthropod. Cuttlefish is a Mollusc. Pufferfish and flying fish belongs to Chordata (Pisces).

53. (D) In ctenophores, asexual reproduction is absent. They are monoecious and fertilisation is external. In cnidaria, asexual reproduction by budding is seen in polyp forms, and sexual reproduction in medusae forms. In protozoan, asexual reproduction occurs by fission, budding, etc., and sexual reproduction by conjugation and syngamy. In porifera, asexual reproduction occurs by gemmule formation.

Related Theory

→ Ctenophores are free-swimming, marine, solitary, pelagic animals with no polymorphism and no attached stages were found. They have a pair of long, solid, retractile tentacles and lack nematocysts. They have special adhesive and sensory cells, i.e., colloblast or lasso cells present in tentacles, which helps in food capture. They are monoecious (hermaphrodite); gonads are endodermal situated on walls of digestive canals and development is direct with characteristic cydippid larva and lack asexual reproduction and alternation of generation. Regeneration and paedogenesis are common in them. E.g., *Pleurobrachia*, *Hormiphora*, *Ctenoplana*, and *Coeloplana*.

54. (D) Duckbilled platypus is an oviparous mammal. Millipede belongs to Class Diplopoda. Sea anemone are diploblastic. Silverfish is an insect (non-chordata) not fish (chordata).

Caution

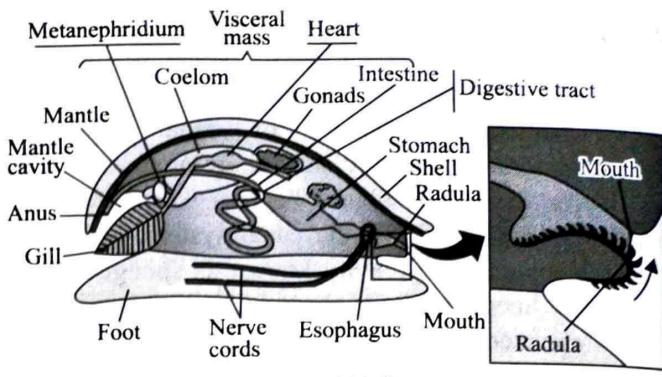
→ Students should remember that mammals are usually viviparous, but duckbilled platypus is an exception.

55. (D) Sharks and dogfishes have cylindrical body, while skates and rays have both of their pectoral fins fused. It gives a wing-like appearance and are not distinct from body.

56. (A) Molluscs are bilaterally symmetrical, triploblastic, coelomate, soft bodied animals. The soft body is covered by a calcareous shell and is unsegmented with a distinct head, muscular foot and visceral hump. E.g., *Pila* (apple snail), *Sepia* (cuttle fish), *Pinctada* (pearl oyster), etc.

Related Theory

→ The molluscs consists of a rasping "tongue" called a radula. The radula apparatus consists of two parts: the cartilaginous base (the odontophore), with the odontophore protractor muscle, the radula protractor muscle and the radula retractor muscle. The radula itself, with its longitudinal rows of chitinous and recurved teeth, the cuticula.



Anatomy of Molluscs

57. (D) Sea horse and flying fish belong to Class-Pisces and are cold-blooded animals (poikilothermic). Metameric segmentation is found in Annelida not Nematoda (*Ascaris*). Crocodile is the only reptile that has four-chambered heart. *Ornithorhynchus* (platypus) is an oviparous mammal.

Related Theory

→ Characteristics of Mammals includes:

- (1) Mammals are a class of endothermic vertebrates.
- (2) Skin of mammal is unique in possessing hair.
- (3) Sweat glands are found.
- (4) Glands specialised to produce milk, known as mammary glands. It is the most unique feature.
- (5) Three middle ear bones.
- (6) A neocortex region in the brain, which specializes in seeing and hearing.
- (7) A four-chambered heart.
- (8) Respiration is by lungs.
- (9) They are viviparous with few exceptions.

58. (B) In bony fishes, there are four pairs of gills and each is covered over by an operculum on either side. Prototherian mammals are oviparous. Sponges are aquatic, mostly marine and some freshwater and have choanocytes or collar cells, which are characteristic of porifera. All reptiles possess scales, are cold blooded but have three-chambered and four-chambered heart.

59. (C) The male sharks have a pair of intromittent organs, called claspers. Claspers are modifications of the pelvic fins and located on the inner margins of the pelvic fins. The male frogs can be distinguished by the presence of the sound producing vocal sacs and also a copulatory pad on the first digit of the forelimbs. Male and female cockroaches can be distinguished externally through anal style, which is present only in males and absent in female. Anal cerci are present in both male and female and are sensitive to wind movements and detect vibrations. Females *Ascaris* are longer than males and the posterior part of the female body is curved. Pineal setae are seen only in male *Ascaris*.

Related Theory

→ Sexual dimorphism is the systematic difference in form between individuals of different sex in the same species.

60. (C) In humans, the notochord forms in week 3 during its embryonic stage, is eventually lost during the formation of the vertebral column. Ascidians are tunicates that have a notochord during their early development, but it is lost by the time they have completed their metamorphosis. All the vertebrates, fishes, amphibians, reptiles, birds, mammals have the notochord in the developing stage, but replaced by vertebral column later. In *Amphioxus* (Cephalochordata), the notochord extends from anterior end to posterior end, throughout their life.

Related Theory

→ The notochord is an elastic rod, which extends through chordate organisms, providing rigid support. In the more derived chordates, the vertebrates, the notochord is replaced by the vertebral column, and becomes the cartilaginous substance between vertebrae.

61. (C) *Spongilla* belongs to Phylum Porifera, in which the characteristic cells are choanocytes, these are absent in leech, dolphin and penguin. Dolphin is a homeothermic, while other three are poikilothermic. *Spongilla*, leech and dolphin are freshwater and penguin is adapted to salty water. *Spongilla* is asymmetrical, while other three are bilaterally symmetrical.

Related Theory

→ *Spongilla* is classified under Phylum Porifera. They belong to the class Demospongiae, characterised by the skeleton of spongin fibres, siliceous spicules or both. They are found attached to rocks, sticks and plants. To withstand adverse weather conditions, they have a dormant stage known as gemmules. These sponges have a thin dermal layer and have a soft texture.

62. (B) In earthworm, the excretory organs occur as segmentally arranged coiled tubules called nephridia. They are of three types- septal nephridia, integumentary nephridia, and pharyngeal nephridia. In humans, organs of excretion include the skin, liver, large intestine, lungs, and kidneys. Glands do not form the part of excretory organ. Malpighian tubules are the excretory organs of cockroaches. The excretory system of a frog consists of a kidney pair, a pair of ureters, a urinary bladder, and a cloaca and skin. Buccal epithelium is not an excretory organ in frog.

Related Theory

→ A nephridium starts out as a funnel that collects excess fluid from the coelomic chamber. The funnel connects with a tubular part of the nephridium, which delivers the wastes through a pore to the surface in the body wall into the digestive tube.

63. (A) Huxley called birds "glorified reptiles", i.e., birds have evolved from same reptilian ancestor. Both birds and reptiles lay the same type of eggs, which are deposited outside water. Eggs are large and telolecithal, surrounded by albumen, an egg

membrane and a thick hard calcareous shell. Birds like mammals have completely four chambered heart with double circulation, in which there is no mixing of pure and impure bloods. All birds are covered by feathers, which are homologous to the reptilian horny scales as they have a similar origin and develop from similar germ buds, along with horny epidermal scales confined to the lower parts of their legs and feet.

64. (C) Characteristics of Phylum Annelida:

- (1) Annelids show metamerism, are bilaterally symmetrical, coelomate and triploblastic.
- (2) They exhibit organ system grade of organisation, showing organ differentiation.
- (3) They have parapodia and chitinous setae, used for locomotion.
- (4) Their body appears red due to the presence of haemoglobin.
- (5) Excretory (nephridia) and nervous systems (having ventral nerve chord) are present. The digestive system is complete and developed.
- (6) Respiration happens through the general body surface.
- (7) They have a true closed circulatory system.

65. (A) Arthropoda is divisible into head, thorax and abdomen. Head and thorax are often fused to form cephalothorax. The respiration takes place by general body surface, gills, trachea or book lungs. Chordates are sharply distinguished from non-chordates by presence of notochord, dorsal tubular central nervous system and pharyngeal gills slits. Echinoderms have a pentamerous radial symmetry derived from an original bilateral symmetry. The fertilisation is external and development is indirect through free-swimming larval forms. Molluscs are dioecious or monoecious, one or more gonads, opening into renal ducts or to exterior. The fertilisation is external or internal, development is direct or through free larval forms.

66. (D) Homeothermy occurs in birds and mammals. Parrot and platypus have toothless jaws and show oviparity. Kangaroo shows viviparity. Platypus and kangaroo have functional post anal tail.

Related Theory

→ The platypus (*Ornithorhynchus anatinus*), sometimes referred to as the duck-billed platypus, is a semiaquatic, egg-laying mammal endemic to eastern Australia. It is a monotreme, and shows oviparity (exception to mammals).

67. (A) Leech is an Annelid, and has ventral central nervous system, which consists of nerve ring, and a solid, double, mid ventral nerve cord with ganglia.

Chameleon is a reptile, possessing pharyngeal gill slits during its embryonic development, and are later replaced by lungs.

Scorpion is an Arthropoda, having dorsal heart. Octopus, a mollusc do not possess post anal tail. It is a characteristic feature of mammals.



Related Theory

→ The arthropod nervous system consists of a dorsal brain and a ventral, ganglionated longitudinal nerve cord (primitively paired) from which lateral nerves extend in each segment. The system is similar to that of annelid worms, from which arthropods may have evolved.

68. (D) Crocodile belongs to Class Reptilia has four chambered heart. Lemur teeth are embedded in the sockets of two, which is known as thecodont. In *Obelia*, polyps reproduce medusae asexually and medusae form the polyps sexually. Such alternation of sexual phases in the life cycle is called metagenesis. Parapodia are present in Annelida, while sea urchin is an Echinoderm.

69. (D) Mollusca – *Loligo, Teredo, Octopus*
 Porifera – *Spongilla, Euplectella*
 Cnidaria – *Physalia, Aurelia, Pennatula*
 Annelida – *Bonellia*
 Platyhelminthes – *Planaria, Schistosoma*
 Aschelminthes – *Enterobius*



Related Theory

→ *Loligo* is commonly called squid or sea arrow and is gregarious, fast swimmer in the open water of the sea and is carnivorous, feeding on crabs and fishes. *Octopus* (Devil fish) is found at the bottom of the sea. It is nocturnal and feeds on crabs, fishes and other molluscs. *Teredo* or shipworm is a marine bivalve, which has small anterior shell and long slender body with a small foot functioning as adhesive structure.

70. (A) Mammals show viviparity. Kangaroo, hedgehog, dolphin and *Loris* are mammals. These give birth to young ones.

Viviparous Mammals: Kangaroo, Hedgehog, Dolphin, *Loris*, Lion, Bat, Whale, Hippopotamus, Shrew, and Cat.

Birds (Oviparous): Ostrich, Penguin, and Kiwi.



Related Theory

→ Viviparous animals are present in all groups of vertebrates except birds. Fish, amphibians, reptiles, and mammals all have members that are viviparous even though none of the groups is exclusively viviparous.



Caution

→ *Echidna* and *Platypus* are two egg-laying mammals. Ovoviviparous animals are those wherein the embryos develop in the eggs and remain in the body of the mother until they are capable of hatching.

71. (C) Crab, centipede and cockroach belong to Phylum Arthropoda. These have jointed appendages and a chitinous exoskeleton.

72. (C) *Ctenoplana* and *Beroe* lack cnidoblasts and have biradial symmetry. These belong to Phylum Ctenophora. *Hydra*, sea anemone and *Aurelia* are coelenterates, which have cnidoblasts.

73. (C) In higher vertebrates (reptiles, birds, mammals) there are 12 pairs of cranial nerves, while fish and amphibian have 10 pairs of cranial nerves. Alveolar lungs, seven cervical vertebrae, and thecodont dentition are typical of Class Mammalia.

74. (A)

Platyhelminthes	Annelids
Acoelomate	Enterocoelomate
Bilaterally symmetrical	Bilaterally symmetrical
Flat worms	Segmented round worms
Metamerism absent	Metamerism present

75. (B) Diaphragm is found in mammals only. Homeothermy is found in amphibians, mammals and birds. Birds, mammals and crocodile have four-chambered hearts. Rib cage is found in most tetrapod.



Related Theory

→ Diaphragm, dome-shaped, muscular and membranous structure that separates the thoracic (chest) and abdominal cavities in mammals; it is the principal muscle of respiration. The lungs serve as the gas-exchanging organ for the process of respiration.

76. (A) In some members of the Phylum Arthropoda, the fused head and thorax is called as cephalothorax. It is found in members Myriapoda, Arachnida and in some Crustacea. Adult insect body is divided into three parts (head, thorax and abdomen), three pairs of legs and two pairs of wings.



Related Theory

Arthropod class	Examples	Characteristics
Crustacea	Prawn, Crab	Cephalothorax
Chilopoda	Centipede	Body is divided into Head + trunk
Diplopoda	Milipede	Body is divided into Head + thorax + abdomen
Insecta	Honeybee, Silkworm, Housefly	Body is divided into Head + thorax + abdomen
Onychophora	Peripatus	Unsegmented body
Merostoma	King crab (<i>Limulus</i>)	Cephalothorax
Arachnida	Spider, Scorpion	Cephalothorax

77. (D) Tadpoles are the larval forms of frog and toads. They respire through gills, whereas the adult form respire through the skin and lungs. As fishes also respire through gills, hence, presence of gills in the tadpole indicates that frogs are evolved from gilled ancestors.

Related Theory

→ "Ontogeny recapitulates phylogeny" means that the development of individual organisms (ontogeny) follows (recapitulates) the same phases of the evolution of larger ancestral groups of related organisms (phylogeny).

78. (B) Dolphins are mammals, which respire by lungs.

79. (B) Complete metamorphosis is a phenomenon by which a larva after moulting several times changes into an adult form. The life cycle of *Musca* includes four stages-egg, larva, pupa and adult.

Pheretima is bisexual, having both male and female reproductive organs.

Chameleon shows camouflage.

Taenia does not show polymorphism.

Related Theory

→ In complete metamorphosis, larva after hatching, moults several times to become a fully grown one. It later becomes a pupa within a secreted case, called the puparium. Pupa differentiates into the young adult that breaks the puparium open and emerges outside. Then it grows to a mature form.

80. (D) *Fasciola hepatica* is called as digenetic because its life cycle is completed in two hosts (sheep and invertebrate host). It is endoparasite because it lives inside the bile passage of sheep.

The larval stage of *Fasciola* that infects intermediate hosts is the miracidium and the primary host is metacercaria.

Related Theory

→ The infective stage of liverfluke is metacercariae (larval stage).

81. (B) Cellular level of organisation (loose mass of cells) – Phylum Porifera.

Tissue levels of organisation – Phylum Coelenterata. Organ level of organisation – Phylum Platyhelminthes and Aschelminthes.

Organ system level of organisation – Annelida, Arthropoda, Mollusca, Echinodermata, and Chordata.

82. (D) Snakes are limbless vertebrates belonging to Class Reptilia. They have elongated cylindrical body, covered with overlapping scales differentiated into

shields and plates. They have extended post anal tail which supports in locomotion.

Related Theory

→ A post-anal tail is among the main characteristic features of all the chordates. It is a body extension running alongside an anal opening. In certain chordates, it is extended and considered as means of locomotion, whereas in others it is reduced.

83. (A) Sexes in *Ascaris* are separate and sexual dimorphism is well defined. In *Anopheles*, the ends of manillary palps in male are club shaped, while in females they are not found.

84. (C) The organisms attached to the substratum generally possess radial symmetry. Radial symmetry is the symmetry in which every plane passing through the centre divides the body into two equal halves, such as in starfish.

85. (A) Aristotle's lantern occurs in class Echinoidea.

Related Theory

→ Echinoidea belongs to Phylum Echinodermata. The teeth in lantern is extruded to help in scrapping of algae from the rocks.

86. (D) Eye of the Cephalopoda group resembles vertebrate eye. It possesses same resemblance that of vertebrate such as cornea, iris, lens and retina.

87. (C) Housefly or *Musca* is regarded as mechanical carrier of many diseases.

88. (A) Bladderworm/cysticercus is the larval stage of tapeworm.

89. (A) *Taenia saginata* is divisible into scolex, neck and strobila. The scolex bears four adhesive suckers, but it does not have rostellum and hooks. While *Taenia solium* bears rostellum and hooks.

90. (D) Wish bone of birds is formed from pectoral girdle/clavicles.

Related Theory

→ Wishbone is a forked bone formed due to fusion of two clavicles. It is found in birds and some dinosaurs.

91. (A) Transfer of *Taenia* to secondary host occurs as oncosphere. Oncospheres pass through faces of human secondary host (pig) acquires infection by ingestion of oncospheres.

92. (C) Both male and female pigeons secrete milk through crop.

93. (D) Cetacea is an order of Class Mammalia. It includes whales, dolphins, porpoises, etc. These animals have fish-shaped bodies and broad, paddle-like forelimbs (called flippers) and are adapted to aquatic life.

