

**ANIMAL KINGDOM
SOLUTIONS**

LEVEL – 1

1. Frontal plane/coronal plane dissects body into dorsal and ventral halves whereas sagittal plane/longitudinal plane dissects into two lateral halves and horizontal/transverse plane dissects into anterior- posterior halves.
2. Metamerism or segmentation is seen only in Annelids, Arthropods and Chordates.
3. Limulus is king crab , which is also considered as living fossil. Apis- for honey and wax, Laccifer- for lac ,resin like substance, Bombyx- for silk.
4. Endoskeleton is present in echinoderms , respiratory pigments is present in annelids and mollusca , muscular heart present in arthropods , annelids , Mollusca and hemichordate.Notochord always absent and nerve cord if present is ventral.
5. True coelom are the cavity present inside the mesoderm.
6. Radial symmetry is mostly seen in exclusive marine animals like cnidaria , ctenophora and echinodermata.
7. In acoelomate, cavity are absent inside mesoderm and it is seen in phyla from porifera to Platyhelminthes.
8. Metamerism is seen in annelida , arthropoda and chordates.
9. Two germ layers are diploblastic (ectoderm and endoderm) and three germ layers are triploblastic (ectoderm , mesoderm and endoderm).
10. Aschelminthes is bilateral , triploblastic and pseudocoelomate, all others are diploblastic.
11. Locust is arthropoda and annelida both are , coelomate (schizocoelom) triploblastic with tube within tube body plan.
12. Pseudocoelom is seen in phylum Aschelminthes.
13. Insects exoskeleton is made up of chitin which protects them from harmful radiation and also checks the loss of water.
14. Cnidoblast cells are also called nematoblast or stinging cells which plays a role in offense , defence , capture food and anchorage.
15. Round worm are aschelminthes which are dioceous (sexes separate).
16. Platyhelminthes are acoelomate with organ level of organization.
17. Schistosoma (blood fluke) is among the few Platyhelminthes which are dioceous.
18. Suckers are the characteristic of Hirudinaria (leech) whereas parapodia is seen in Neries , setae and clitellum is seen is seen is earthworm.
19. All sponge contain choanoflagellates (collar cells) which contains flagella to capture food,maintain water current and plays a role in excretion and respiration.Spongilla is fresh water sponge .Sponges endoskeleton is made of either spicules of Ca or silica or spongin fibres.Sponges reproduce sexually and asexually.

20. Hydra has blind sac body plan so food enters through mouth and undigested food leaves through mouth only. It has no specialized excretory structure so waste are excreted through body surface by process called diffusion.
21. Both hydra and sponge shows asexual reproduction by budding as well inspite of sexual reproduction .Starfish and tapeworm show fragmentation.
22. Flame cells are also called as solenocytes or protonephridia which is seen in Platyhelminthes , rotifers (aschelminthes) and cephalochordate, both are organs of excretion.
23. Ctenoplana and pleurobrachia are ctenophore shows radial symmetry and do not contain cnidioblast.
24. Gastrovascular cavity is seen in cnidarians , whereas spongocoel/paragastric cavity/atrium is seen in porifera .
25. Feathers like gills are also called ctenidia present in mantle cavity.
26. (3)
27. All the echinoderms are exclusively marine .
28. Earthworm , cockroach and spider are all non chordates which shows ventral solid CNS.
29. Arthropods have open circulatory system. Annelids and Hemichordates-fertilisation is mostly external. Annelids –closed circulatory system
30. Septa are the transverse muscle present in Annelia for internal segmentation.
31. In chordata heart is ventral muscular hollow heart.
32. (2)
33. In Balanoglossus circulation is open type.
34. In all chordates post anal tail is seen at some stage of life .
35. All chordate possess dorsal solid mesodermal notochord which modifies in vertebrates to form vertebral column.
36. All chordates have notochord during embryonic life. In vertebrates, notochord is slowly replaced by vertebral column.
37. XI NCERT pg 55, 2nd para
38. Petromyzon is cyclostomata (agnatha) under class vertebrata.
39. Protochordates are the chordates in which notochord is not modified to form vertebral column in adult stage , hence protochordates are invertebrates.
40. XI NCERT pg 55, Fig.4.16
41. Scoliodon is a cartilaginous fish (chondrichthyes) whose epidermal skin bears placoid scales.
42. Scales present on osteichthyes is ganoid , ctenoid , cycloid whereas in chondichthyes it has placoid scales. Both placoid and cycloid scales are dermal as both arise from the dermis of skin. Only chondrichthyes have claspers and Osteichthyes have 4 pairs of gills. Notochord (as per NCERT) is considered to be persistent in Chondrichthyes.

43. As Bony fishes have bony endoskeleton therefore their body weight density is high so air bladder or swim bladder are present in order to prevent from sink.
44. Torpedo or electric ray which has modified muscle which produces electric field to catch prey, offence and defence.
45. (a) is Scoliodon and (b) is Pristis, both being chondrichthyes shows all the above features.
46. Petromyzon has ammocoete larvae.
47. Given diagram is of Petromyzon (cyclostomata) which has closed circulatory type and paired fins are absent.
48. Amniotes are the reptiles, birds and mammals which have amniotic membrane as an extra-embryonic membrane surrounds the foetus.
49. Pharynx is perforated by gill slits. Presence of dorsal nerve cord. Heart is ventral.
50. Exocoelous is a flying fish which has bony endoskeleton belongs to osteichthyes. Osteichthyes has 4 pairs of gill slits.
51. Dogfish (chondrichthyes, 2 chambered heart) – Salamander (amphibian, 3 chambered heart) – Alligator (reptile, 4 chambered heart) – Rabbit (mammal, perfectly 4 chambered heart).
52. Only few reptiles like snakes and lizards shed their scales as skin cast.
53. 60% respiration occurs through the skin and 40% respiration occurs through the lungs.
54. In reptiles tympanum represents the ear.
55. All are tetrapods except bony fish.
56. Sea urchin is echinoderm and parapodia is seen in aquatic annelids. Lemur being Primate mammal shows thecodont dentition.
57. Operculum is the lid covering the gill slit in bony fishes. Most sponges (except Spongilla) are marine and have collared cells. Most mammals (except Prototheria egg laying) are viviparous and possess diaphragm for breathing. All reptiles possess scales, have a three chambered heart (except crocodile) and are cold blooded (poikilothermal).
58. Mammary glands are present in all. Only c and d possess placenta. In c and d forelimbs are not absent but modified into patagium and flippers respectively.
59. Frog (amphibian) evolved from Fishes, and presence of gills in tadpole is an indication of that.
60. Sea horse and Flying fish are cold blooded animal (poikilothermal). Garden lizard (Three chambered heart) and Crocodile (four chambered heart). Ascaris and Ancylostoma (both round worms) – Metameric segmentation absent. Pteropus (Viviparity) and Ornithorhynchus (oviparous)

LEVEL - 2

1. All the radially symmetrical animals are not diploblastic, echinoderms are radially symmetrical but triploblastic. All the triploblastic animals have bilateral symmetry except echinoderms. All the diploblastic animals are not asymmetrical, Cnidaria and ctenophore are diploblastic but radially symmetrical.

2. The sequence of the following subdivisions shall be Bilateria-Coelomates-Protostomes/deuterostomes
3. Mesoderm are present as scattered pouches in pseudocoelomates (Aschelminthes) due to which cavity is not completely lined by mesoderm.
4. Mesogleia is a non-cellular matrix present in between the body wall of diploblastic organism (hydra).
5. Molluscs are coelomates . Insects are coelomates. Flat worms (Platyhelminthes) are acoelomates
6. Power of regeneration is good among the lower invertebrates especially among the porifera , cnidarian , platyhelminthes and Echinodermata.
7. Protonephridia is an excretory structure in platyhemintnes. Annelids have nephridia or metanephridia for excretion.
8. Platyhelminthes are dorso-ventrally flat, hence called flatworms.
9. The outer body wall is covered by cuticle which is made up of scleroprotein , this scleroprotein makes them resistant to acidic and alkaline digestive juice.but body wall has inly longitudinal smooth muscle and not circular muscles.
10. Flatworms are mostly parasitic but few are free living like Planaria. Only parasitic forms have suckers. They are triploblastic acoelomate and hence lack circulatory system. They respire through their body surface hence do not separately need organ for gas exchange.
11. Radiata includes Cnidaria and Ctenophora , and both lack cephalization and do not show bilateral symmetry of larval forms.They have incomplete digestive tract with a single opening ie blind sac body plan.
12. XI NCERT pg 50, 2nd para
13. Pearl is made up of calcium carbonate .
14. XI NCERT pg 50, 2nd para .Hypostome are the conical projection on the upper surface of body on which opening is present called mouth through which ingestion and egestion occurs.
15. Metagenesis is the alteration of generation shown by physalia and obelia.
16. Medusa stage which is in umbrella shaped for free swimming so in order to maintain balance and equilibrium they have specialized sensory structure called statocyst.
17. Crustacea and Arachnida- classes of Arthropods. Polychaeta and Hirudinea- classes of Annelida.Cnidaria is a phylum.
18. Nereis is dioecious ie unisexual.
19. (a) is Aurelia (cnidarian). (b) is Pleurobrachia (Ctenophora)
20. Parapodia in Nereis is mainly organ for locomotion and respiration. Excretion is done by nephridia.
21. (1)

22. Radula is absent in Bivalve molluscs like oysters , mussels and clam. Gills are absent in terrestrial gastropods like snail and distinct cephalization is seen only in class cephalopods like octopus .
23. Radula is absent in Bivalve molluscs like oysters , mussels and clam. Shell may be present or absent in molluscs. Mantle is the body covering of mollusc.
24. Pheretima is monoecious and hence Sexual dimorphism absent. Polymorphism is distinct in Planaria and not Taenia. Octopus has radula. Musca domestica (housefly) shows indirect development , its larvae is called maggots.being insect shows complete metamorphosis.
25. Nereis is dioecious annelid..
26. Echinodermata –exclusively marine,only open circulatory system (highly reduced), external fertilisation, indirect development only.
27. Closed circulatory system is seen in annelida , Mollusca – cephalopoda (like octopus).
28. Absence of nerve cells in porifera.
29. These are arthropods having jointed legs and chitinous exoskeleton.
30. Ophiura is brittle star which belongs to phylum echinodermata . The larvae of echinoderm shows bilateral symmetrical and adult is penta-radial symmetrical.
31. (2)
32. Cephalochordata are acraniata with persistant notochord. Solenocytes or flame cells as organ of excretion.They are eucoelomate. Cephalisation is not distinct.
33. Hemichordates are exclusively marine worm like animals.
34. Urochordates have body covering made up of cellulose called tunicin. The larval tail contains notochord which gets disappeared in adult.
35. Phyla echinodermata , hemichordate and chordata have enterocoelom.
36. XI NCERT pg 55, table 4.1
37. All chordates have Pharyngeal gill slits during embryonic life ,that's persistant in protochordates. But vertebrates or craniates during adulthood lack Pharyngeal gill slits.
38. Ctenophora , Echinodermata , hemichordate ,chordates - protochordates and cartilaginous fishes are exclusively marine animals.
39. Larvae of echinodermata are bilaterally symmetrical whereas adult are pentamerous symmetrical.
40. Closed circulatory system are present in phylum annelida , Mollusca – class : cephalopoda and phylum chordata.
41. XI NCERT pg 56,1st para
42. Amphibians and Mammals have dicondylic skull.
43. Fishes , Amphibians , Reptiles and Birds have nucleated , oval and biconvex RBC. Petromyzon, Pristis, Salamandra and Testudo are poikilothermic .Testudo respire through lungs.All except Salamandra show internal fertilization.

44. Bilateral symmetry started from Platyhelminthes and hence shall include all other clades. Amniotes are only reptiles , aves and mammals.
45. In chordates notochord is present in some stage of life especially embryonic and in most gets replaced by vertebral column.
46. In adult urochordata dorsal hollow nerve cord is modified to form single dorsal ganglion and notochord degenerates.
47. Chimera is considered as connecting link between chondrichthyes and osteichthyes. Like chondrichthyes it has cartilaginous endoskeleton and presence of pelvic claspers for fertilization . Like osteichthyes it shows presence of operculum and presence of anus .
48. The RBC of amphibians are largest amongst all vertebrates and are nucleated, oval and biconvex.
49. (4)
50. XI NCERT pg 55. Table 4.1. Cephalochordates lack heart. Presence of pharyngeal gill slits throughout life-only in protochordates. Notochord extends from head to tail throughout life.- only in cephalochordates.
51. As aves have the ability to fly and being homeothermic they can control their body temperature so they are present throughout the different parts of the world , so they are widely diversified among the all the tetrapods.
52. XI NCERT pg 56. Pristis is a cartilaginous fish.
53. As birds are adapted for flight , so they need to produce more ATP for that they require more oxygen and hence they require more hemoglobin as well to carry oxygen. Nucleated RBC contains less number of hemoglobin as compare to enucleated RBC.
54. Glandular skin is the only feature of amphibians and mammals .
55. Pisces bear copulatory organs (Chondrichthyes) and they are viviparous. Only eutherians Mammals are placental. Reptiles perform only pulmonary respiration.
56. All amniotes have 12 pairs of cranial nerves. Amniotes are reptiles , birds and mammals.
57. Kangaroo , hedgehog , dolphin and Loris are viviparous mammals . Ostrich, kiwi-Birds. Platypus-oviparous mammal.
58. Sea urchin (echinoderm) and Parapodia found in aquatic annelids like Nereis.
59. Ascaris unsegmented body and belongs to Aschelminthes. Pteropus is viviparous mammal. Aurelia shows tissue level of organization.
60. Thyroxine hormone plays an important role in metamorphosis in amphibians.

ASSERTION & REASON

In the following questions a statement of assertion (A) is followed by a statement of reason (R).

- (1) If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)*
- (2) If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)*
- (3) If Assertion is true statement but Reason is false, then mark (3)*
- (4) If both Assertion and Reason are false statements, then mark (4)*

1. **Assertion :** Bilateral symmetry originated in triploblastic animals
Reason : Bilateral symmetry have evolved when radial animals begin to move along a surface, probably the interface between water and substratum
(1)

2. **Assertion :** Diploblastic animals lack exoskeleton and endoskeleton
Reason : Mesodermal layer is absent in diploblastic animals
(4)
 Diploblastic animals may have exoskeleton (corals) or endoskeleton (porifera).

3. **Assertion :** The skeleton of sponges is made up of spicules.
Reason : Composition of spicules help in classification of sponges
(2)
Spicules help in making skeleton of sponges. These are made up of silica, calcium or Spongin substances. The structure of spicules also help in classification of sponges.

4. **Assertion :** Sponges belong to Porifera.
Reason : Sponges have canal system.
(2)
 Sponges belong to Porifera and they have characteristic canal system.

5. **Assertion :** Cnidoblasts are present on the tentacles and the body in cnidarians.
Reason : Cnidoblasts are used for anchorage, defence and capture of the prey.
(2)
 Cnidoblast cells are present on the tentacles and the body of cnidarians. A cnidoblast (also called nematoblast) has nematocyst known as 'stinging organ' (consisting of capsule, shaft and thread tube) used for anchorage, defense and offence.

6. **Assertion :** Animals that have an exoskeleton lacks an endoskeleton.
Reason : Skeleton cells in the embryonic stage migrate to either stage and produce exoskeleton or endoskeleton but never both.
(4)
 Many animals have an endoskeleton and exoskeleton such as Chelon-turtle or Testudo-tortoise. Exoskeleton of other animals include chitinous plate, calcareous shell, horny scales, feathers, hair, claws, nails, hoofs, horns and antlers.

7. **Assertion :** Echinoderms are the only radially symmetrical animals with true coelom.
Reason : Echinoderms have secondarily adapted to radial symmetry.
 (2)
 Assertion is true; Echinoderms are only radially symmetrical animals with true coelom.
 Reason is also true as echinoderms have secondarily adapted to radial symmetry because larval forms of echinoderm are bilaterally symmetric, but adults are radially symmetric.
 Both assertion and reason are correct. But reason is not the correct explanation for assertion.
8. **Assertion :** Hydra has a nerve net, but no brain.
Reason : All its neurons are apolar and connected.
 (1)
 Assertion is true, in hydra, nerve cells are present which join to form nerve net, but nerve cells are not organized to form brain in Hydra.
 Reason is also true as neurons in Hydra are apolar. These apolar neurons (with no axon terminals) can join to form nerve net. Hence both Assertion and Reason are correct, and reason is the correct explanation for assertion.
9. **Assertion :** Radula is rasping organ of all molluscs.
Reason : It is made up of chitin.
 (4)
 Assertion is false as radula is not present in all molluscs.
 Radula is absent in class pelecypoda (Bivalvia) of molluscs.
 Reason is also false as radula bears chitinous teeth.
 Both assertion and reason are false.
10. **Assertion :** True coelom originated for the first time in phylum annelida
Reason : It allowed the animal to have an alimentary canal longer than the body and space for other organs.
 (2)
 Assertion is true, True coelom (lined by mesoderm) on both sides for first time originated in phyla Annelida.
 Reason is true, and Annelids have longer alimentary canal than body and space for storing other organs.
 Both Assertion and Reason are correct, but Reason is not the correct explanation for Assertion.
11. **Assertion :** Chitinous exoskeleton is a characteristic feature of arthropods.
Reason : It allows diffusion of water vapour from the atmosphere to the body.
 (3)
 Assertion is true. Chitinous exoskeleton is a characteristic feature of arthropods.
 Reason is false as chitin is impermeable to water and does not allow water vapour diffusion from atmosphere to body or vice-versa.
 Assertion is true, but Reason is false.
12. **Assertion :** The duck-billed platypus and the spiny anteater are egg-laying animals yet are grouped under mammals.
Reason : Both of them have seven cervical vertebrae and mammary glands without teats.
 (1)

Assertion is correct as a duck billed platypus and spiny anteater are oviparous mammals but are grouped under mammals due to other mammalian features, such as the presence of seven cervical vertebrae in the neck and mammary gland (without teats).
Both Assertion and reason are correct. And reason is the correct explanation for assertion.

13. **Assertion :** In Balanoglossus, the proboscis is involved in excretion.
Reason : Glomerulus is present in proboscis.
(1)
Assertion is true. i.e. In Balanoglossus, the proboscis is involved in excretion.
Balanoglossus belong to phylum hemichordate where proboscis gland performs an excretory function.
Reason is also true, i.e. Glomerulus is present in proboscis responsible for or mediating the excretory function of proboscis gland. Both assertion and reason are correct, and reason is the correct explanation for assertion.
14. **Assertion :** Dicondylic skull is found in amphibians and mammals.
Reason : The number of cranial nerves in amphibians and mammals is same.
(3)
Assertion is correct as amphibian and mammals possess dicondylic skull.
Reason is false as amphibian possess 10 pairs of cranial nerves and mammals possess 12 pairs of cranial nerves.
15. **Assertion :** Piscean scales are similar to reptilian scales in origin.
Reason : Age of the animal can be deduced by lines of growth on both the scales.
(4)
Assertion is false, as scales in fishes are mesodermal in origin whereas scales in reptiles are epidermal.
Reason is true as animals age can be deduced by lines of growth on both the scales.
16. **Assertion :** The lungs of birds are provided with air sacs.
Reason : Air sacs supplement respiration.
(2)
Assertion is true as air sacs are connected to lungs in birds.
To bring fresh air to the lungs. Birds use eight or nine air sacs situated on either side of the lungs.
Reason is also true as air sacs make ventilation in birds highly efficient. Air sacs ensure air flow over the gas exchange surface in only one direction and do not allow mixing of air. Thus air sacs supplement respiration in birds.
Both assertion and reason are true, but reason is not the correct explanation for assertion.
17. **Assertion :** An anti-coagulant hirudin is present in salivary glands of leech.
Reason : It leads to blood clotting while the leech is feeding.
(3)
An anti-coagulant hirudin is present in salivary glands of leech. It prevents the blood from clotting while the leech is feeding.
18. **Assertion :** All chordates are vertebrates.
Reason : They possess hollow vertebral column that protects nerve cord or spinal nerves.
(4)
All chordates are not vertebrates : Vertebrates have vertebral column but protochordates

and agnatha have notochord that is not replaced by vertebral column.

19. **Assertion** : Annelids like Nereis can easily swim in water.
Reason : An adult Nereis develops fins.
 (3)
 Annelids like Nereis possess lateral appendages, parapodia which help in swimming.
20. **Assertion** : Frogs are poikilotherms.
Reason : They are with able to stand cold weather and high temperature.
 (3)
 Amphibians (frogs) are poikilotherms, also called cold blooded or ectothermic animals. The cold blooded animals change their body temperature according to the surroundings (do not possess a constant body temperature). Also being poikilotherms, they cannot withstand cold weather and high temperature.
21. **Assertion** : Cnidarians, Ctenophorans, and Echinodermates show radial symmetry.
Reason : Their body can be divided into two equal halves by cutting it in any plane passing through the central axis.
 (1)
 Cnidarians, ctenophorans, and echinodermates show radial symmetry because their body can be divided into two equal halves by cutting it in any plane through the central axis.
22. **Assertion** : Fishes belonging to class Osteichthyes have to swim constantly.
Reason : Air bladder is absent in these fishes.
 (4)
 Fishes belonging to class chondrichthyes have to swim constantly. It is because air bladder is absent in these fishes therefore. They have to swim constantly to avoid sinking.
23. **Assertion** : Whale is a mammal.
Reason : They respire with the help of lungs only.
 (2)
 Whale is a mammal. The hairs on its body are lost due to aquatic adaptation. They respire with the help of lungs only.
24. **Assertion** : The fishes belonging to class chondrichthyes must swim constantly.
Reason : They possess four pairs of gills which are covered by an operculum on each side.
 (3)
 The fish belonging to class Chondrichthyes have to swim constantly because air bladder is absent in these fishes therefore, they have to swim constantly to avoid sinking. In these fish, gill slits are separate and not covered by operculum.
25. **Assertion** : All chordates have kidneys as excretory organs.
Reason : Kidneys help in the removal of metabolic wastes along with regulating the osmolarity of body fluids.
 (4)
 Assertion is false, all chordates do not possess kidneys as excretory organs. e.g. Urochordata – Neural glands for excretion Cephalochordata – Protonephridia for excretion in vertebrates and other osmoregulation and excretion. Assertion is false, reason is true.

PREVIOUS YEARS QUESTIONS

1. Sponge and hydra both can reproduce sexually as well as asexually. Starfish and Tapeworm show fragmentation as asexual mode of reproduction.
2. Scoliodons are commonly called as great indian shark due to their strong sense of smell. The long snout has Ampulla of Lorenzeni having max. olfactory cells.
3. Balanoglossus belongs to phylum hemichordate which shows open type of circulating system.
4. All the mammals have mammary glands as a typical characteristic. Platypus-oviparous mammal. Aquatic mammal lack hair.
5. Cobra is a vertebrate which belongs to phylum chordate . All chordate shows post anal tail during some stage of their life.
6. Flame cells are the excretory organ in liver fluke (Platyhelminthes).
7. Cuttlefish (Sepia) and mussel are the examples of molluscs. Sea urchin, Feather star, starfish- Echinoderms.
8. In molluscs cuttlefish(sepia) , sea hare(aplysia) , chiton(chitopleura) have internal shell.
9. Sensory cells are the modified neurons present on the surface of hydra to receive stimuli and conduct throughout body parts through nerve net.
10. Foramen of panizzae is a hole that connects the right and left aorta as they leave the heart of all animals of order crocodilia.
11. Metagenesis (alternation of generation) is shown by obelia and physalia in phylum cnidaria.
12. Carmine is a natural red color dye if entered in sponge through ostia then it is released out through osculum by following the water- canal-system in which the flow of the water current is maintained by flagella of choanoflagellates from ostia to spongocoel to osculum.
13. XI NCERT pg 58
14. Water canal system is also called aquiferous system which is considered as life line of sponge.
15. Hydra have specialized sensory cells on its bodywall to detect the stimulus.
16. Ornithorhynchus (duck bill platypus) and Echidna(spiny ant-eater) are the egg laying mammals (protherians) .
17. All chordates shows post anal tail , pharyngeal gill slits at some stage of life , dorsal solid rod notochord and dorsal hollow nerve cord.
18. Pisces and amphibians are anamniotes, 4 extra embryonic membranes protecting the growing foetus is absent.
19. Sycon belongs to phylum porifera which have cellular level of organization. gastrovascular cavity is feature of Cnidarians.
20. Silverfish(lepisma) , scorpion , dragonfly and prawn belong to phylum arthropoda.
21. Ascaris belong to phylum aschelminthes which shows pseudocoelom .

Metamerism(segmentation) is seen in phylum annelida , arthropoda and chordata.

22. Endoskeleton of sponge is either comprises of spicules and sponging fibres or only sponging fibres. Spicules are secreted by sclerocytes and sponging fibres are secreted by spongocytes which are present in between the two layer of body wall.
23. Heloderma is also called beaded lizard which is considered as poisonous lizard. *Hemidactylus*-wall lizard. *Typhlops*-blind non-poisonous snake
24. Amphibians skin are soft , moist and glandular without scales. Birds are homeothermal.
25. Annelida have a true coelom called schizocoelom.
26. *Pinctada vulgaris* commonly called as pearl oysters belongs to phylum Mollusca.
27. XI NCERT pg 54
28. XI NCERT pg 57.
29. All the echinoderms are exclusively marine.
30. (3) Octopus an mollusk and (4) scorpion an arthropod have true coelom(schizocoelom).(1) taenia respire through body wall but (4) Scorpion respire through book lungs.(2) Aurelia shows radial symmetry but (3) Octopus shows bilateral symmetry. On;y (2) Aurelia has cnidoblasts.
31. Male cockroach has 3 asymmetrical chitinous copulatory organ called gonapophysis or phallic organ or phallogeres. There are 100-150 very long Malpighian tubules. Grinding of food is carried out by the mouth parts and gizzard. Nervous system is located ventrally.
32. Planaria can reproduce sexually as well as asexually (transverse binary fission and regeneration).
33. Crustaceans have gills and they show biramous appendages that is one appendages has two branches. Crustaceans head and thorax is fused as cephalothorax. They respire through gills and not book lungs.
34. Notochord is replaced by vertebral column in adults.
35. Baleen is a filter feeding system inside the mouth of whale (hence called Balaenoptera). To use baleen the whale first open its mouth under water to take in water. The whale then pushes water out and animals such as crustaceans are filtered inside the baleen.
36. Diaphragm is the typical mammalian characteristic due to which mammals can hold breath. This diaphragm helps in swimming , singing, yoga and meditation. Rib cage is found in reptiles and aves. Homeothermy and 4 chambered heart is found in aves as well.
37. In spite of scales on hindlimbs , there body is covered by feathers (made up of keratin)which is a modified scale. Thus birds are also considered as glorified reptiles. Reptiles evolved into birds.
38. Exocoetus are commonly called flying fish which have enlarged pectoral fins as an adaption to fly.
39. Aristotle lantern is a dental apparatus present in sea-urchin for mastication(chewing).
40. Vertebrate are also called as craniata in which brain are well developed and it is covered by bone called cranium.Cyclostomes , fishes and most amphibians lack neck.Many vertebrates are limbless .Amphibians lack exoskeleton.

41. Honeybee produces honey and royal jelly.
Lac (lacca insect) produces lac which is a hard resin structure used to make toys ,inks ,dyes , bangles and polishing agent. Cochineal insect is a scale insect which secretes a natural dye called carmine. Sandfly and tse-tse fly are vectors or carriers of pathogens.
42. The skin of the Mollusca is soft and glandular layer called mantle or pallium which may or may not secrete shell.
43. A male cockroach has 3 phallomeres and female has 6 gonapophysis
44. As an adaptation for terrestrial animal to survive on land they need to conserve water as water available on land is scarce.
45. Amphids , phasmids are the sensory organs present in aschelminthes.
46. Mammals, birds and reptiles are amniotes they have 12 pair of cranial nerves.
47. Aurelia is a jellyfish which shows medusa throughout its life.
48. Cnidaria and Ctenophora shows radial symmetry.
49. Periplaneta an arthropod and pila an mollusk have open circulating system , therefore their circulating fluid is called as hemolymph flows in a cavity called hemocoel. *Hydra* ,*Aurelia*,*Taenia* and *Ascaris*-true coelom is absent so no proper circulatory system. *Amphioxus* (*chordate*)- closed circulatory system.
50. Lamprey (petromyzon) and hagfish(myxine) are cyclostomes.
51. Ampulla of lorenzini is a special sensory structure present in cartilaginous fish to detect smell.
52. Echinoderms have tube feet mainly for locomotion.
53. Flatworms are acoelomate whereas roundworms are pseudocoelomate.
54. Phylum ctenophora shows radial symmetry but Ctenoplana and beroe which belongs to phylum ctenophora shows biradial symmetry.
55. Euplectella is considered as a venous flower basket which is used as a wedding gift in japan.
56. Echinoderm ,hemi-chordates and chordate are present at the deuterostomic line of an evolutionary tree.
57. Mammals have thecodont teeth
58. Above all mentioned animals are chordates which shows pharyngeal gill slits at some stage.
59. In humans notochord is only present during the embryonic stage.
60. Tunicates means Urochordates. In tunicates notochord is absent in adult stage. Thus larvae is well developed than adult in tunicates so they shows retrogressive metamorphosis.
61. XI NCERT pg 55, table 4.1.In Protochordates post anal tail is absent.
62. Neopilina has a thin dorsal shell (mollusk feature) and their body is segmented (annelida feature) is also considered as a living fossil .

63. Eutherians means truly placental mammals.
64. Sponge is asymmetrical , leech is a terrestrial annelid and dolphin is homeothermal.
65. Cuttlefish(sepia) is a mollusc which is exclusively marine contain body cavity called hemocoel and shows bilateral symmetry and formation of head (cephalization).
66. XI NCERT pg 54,3rd para
67. Panthera tigris commonly called as tiger. Cuttlefish – Mollusca, a phylum. Humans – Primata, the order. Housefly – Musca, a genus
68. Ostrich , emu , kiwi , rhea are all flightless birds in which wings are highly reduced.
69. Syrinx is a sound producing organ in which vocal cord is absent and it is present at the base of the trachea.
70. Asterias(star fish) has no specialized excretory structure even though it has tube feet for excretion but through tube feet even respiration and locomotion take place.
71. Insects body is covered by chitin which protects them from harmful environmental conditions , so their chances of survival is more and even they have a very high rate of reproductivity.
72. Birds are homeothermal as they can maintain their body temperature irrespective to surrounding environment temperature.
73. (1)
74. Frog RBCs are nucleated and human RBC is enucleated. Frog heart is 3 chambered and Human heart is 4- chambered .Frog show external fertilization .Human and frog being terrestrial shows ureotelism as an adaption to conserve water.
75. Most sponges are marine except Spongilla. Most mammals are viviparous except prototherians like platypus. All reptiles possess a three chambered heart except Crocodile.
76. Flying fish is bony fish called exocoetus
Cuttle fish is sepia which is a mollusk
Pufferfish is a bonyfish
Silverfish is also called lepisma or a bookworm which is a wingless insect.
77. Prawn, Scorpion, Locusta- all are arthropods.
78. Ascariasis spreads through faeco-oral route ie through contaminated food and water.
79. House fly, butterfly, tsetsefly, silverfish- Insecta ,all belongs to phylum arthropods. Spiny anteater-mammal. Cuttlefish-Mollusc, silverfish-Arthropod. Centipede, millipede, spider, scorpion-none of these is an insect.
80. Adamsia-Cnidarian.Ichthyophis-limbless amphibian. Limulus-Arthropod.
81. Torpedo is also called electric ray which has modified modified muscle that produces electric field.
82. Except cnidaria all are exclusively marine .
83. Sea-fan is a cnidarian which is an animal . Animal lacks cell wall whereas saccharomyces a yeast contain cell wall made up of chitin and cyanobacteria(blue green algae) has cell wall

made up of cellulose.

84. Platypus is an egg laying mammal.
85. Aves- skin is dry and non-glandular. Aquatic mammals- body hair and pinna absent.
Cyclostomata-unpaired appendages
86. Water as metabolic waste is formed in all organisms as result of cellular respiration. Terrestrial animals reuse water as they need to conserve water. Grasshopper eliminates N-waste as uric acid.
87. Herdmania belongs to subphylum urochordata ,its larvae is well developed as compare to adult as larvae contains notochord and dorsal nerve cord which in adult notochord degenerates and nervecord modified to form single dorsal ganglion.
88. Trichinella worm shows viviparity whereas all other given endoparasites shows oviparity.
89. Platypus is oviparous mammal, in cyclostomes jaw is absent , crocodilian ordered reptiles have 4 chamber heart.
90. Birds are oviparous whereas most mammals are viviparous except prototherians.
91. Parapodia is seen in Neries (aquatic annelid) as a locomotory and respiratory organ.
92. Cyclostomes belongs to superclass agnatha in which jaw ,gills , scales and paired fins are absent. All reptiles have a three-chambered heart except crocodiles. Bony fishes have gills covered by an operculum not cartilaginous fishes. Most mammals are viviparous except prototherians.
93. Choanocytes are also called choanoflagellates whose flagella maintains the water current in canal system , capture food and plays a role in respiration and excretion etc.
94. The characters share by Hemichordates with chodates are presence of pharyngeal gill slits and 1 dorsal and 1 ventral nerve cord.
95. Sharks, trygon-are not mammals .They are cartilaginous fishes.
96. Horse belongs to order perisodactyla which have odd numbers of hoofed toes.
97. Hint: XI NCERT – Moth (Insecta)- larval stage caterpillar
Starfish (Echinodermata)- Indirect- development showing free swimming larva
Tunicate (Urochordates)- Retrogressive metamorphosis in larval stage.
Earthworm –Direct Development
98. Hint: XI NCERT Pg- 58,59
Camelus&Macropus are mammals, Psittacula (Aves) are homeotherm, Chelone (Reptile)- Cold blooded.
99. Hint: XI NCERT Pg- 58
100. All the three animal groups namely Annelida, Arthropoda and Chordata possess organ system level of organisation, bilateral symmetry and true coelom with segmented body. Molluscans are also bilaterally symmetrical and show organ system grade of organisation but they do not possess segmented body.
101. Annelids are true coelomates with bilateral symmetry. These exhibit organ-system level of body organisation with true coelom. They are triploblastic, metamerically segmented and coelomate animals, e.g. earthworm.

- 102.** (A)-(iii), (B)-(iv), (C)-(ii), (D)-(i)
Pila or apple snail contains a file-like rasping organ called radula for feeding. Bombyx or silkworm is an arthropod in which excretion occurs through Malpighian tubules. The body of ctenophore Pleurobranchia 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.
- 103.** The correct matches are
- | | |
|-------------------------------------|----------------------|
| 1 Ophiura (Brittle star) | (iii) Echinodermata |
| 2. Physalia (Portuguese man of war) | (iv) Coelenterata |
| 3. Pinctada (Pearl oyster) | (ii) Mollusca |
| 4. Planaria(Flatworm) | (ii) Platyhelminthes |
- 104.** The correct option is (a). It can be explained as follows Locusta is a gregarious pest. In echinoderms, adults are radially symmetrical but larvae are bilaterally symmetrical. Scorpions respire through book lungs. Bioluminescence is well-marked in ctenophores.
- 105.** Platyhelminthes are bilaterally symmetrical, triploblastic and acoelomate animals with organ level of organisation. Aschelminthes are bilaterally symmetrical, triploblastic and pseudocoelomate with organ system grade of body organisation. Annelida are bilaterally symmetrical, triploblastic and truly schizocoelomate. Ctenophora are biradially symmetrical,triploblastic and acoelomates.
- 106.** Animals belonging to phylum-Annelida are triploblastic, bilaterally symmetrical and metamerically segmented. They exhibit organ system level of body organisation with presence of coelom. They may be aquatic (marine and freshwater)or terrestrial, free-living and sometimes parasitic.
- 107.** The members of subphylum-Vertebrata possess notochord during the embryonic period. The notochord is replaced by a cartilaginous or bony vertebral column in the adult. Thus, all vertebrates are chordates but, all chordates are not vertebrates.
- 108.** Statement I and III are correct.
Statement I and IV are incorrect and can be corrected as
In Urochordata, notochord is present only in larval tail, while in Cephalochordata, it extend from head to tail region and is persistent throughout their life. Phylum-Chordata is divided into three subphyla i.e. Urochordata or Tunicata, Cephalochordata and Vertebrata.
- 109.** The option (c) is the correct match which is as follows
Aptenodytes is penguin
Pteropus is flying fox
Pterophyllum is angel fish
Petromyzon is lamprey
- 110.** Option (4) is correct. It can be explained as follows
Cyclostomes have an elongated body bearing 6-15 pairs of gill slits for respiration. Air bladder is present in bony fishes belonging to class-Osteichthyes which regulates buoyancy.
Trygon, a cartilaginous fish, possesses poison sting. Heterocercal caudal fin is present in members of class-Chondrichthyes.
- 111.** The option (1) is the correct match which is as follows Platyhelminthes are bilaterally symmetrical with incomplete digestive

system, e.g. Taenia. Echinoderms are radially symmetrical with indirect development, e.g. star fish, sea urchin etc. Hemichordates are cylindrical bodied animal with no segmentation, e.g. Balanoglossus. Aves are warm-blooded animals with direct development like pigeon.

- 112.** Housefly belong to Muscidae family. Muscidae are a family of flies found in Superfamily-Muscoidea. The family-Muscidae is a large dipteran family comprised of more than 5000 species. Other options can be explained as: Firefly belong to Lampyridae family Grasshopper belong to Acrididae family Cockroach belong to Blattidae family.
- 113.** (A)-(2).(B)-(3), (C)-(4), (D)-(1)
 *Physalia belongs to phylum-Coelenterata (Cnidaria) and is Commonly known as Portuguese man-of-war.
 *Limulus belongs to phylum-Arthropoda and is a living fossil and commonly termed as king crab.
 *Ancylostoma belongs to phylum-Aschelminthes and is Commonly referred to as hookworm.
 *Pinctada belongs to phylum-Mollusca and is commonly called pearl oyster.
- 114.** Statements I, III and V are correct, while statements land IV are incorrect. Incorrect statement can be corrected as Comb plates are present in ctenophores which help in locomotion or swimming and not in digestion. Metagenesis is the alternation of generations between sexual and asexual reproduction. In helminths metagenesis is not observed.
- 115.** The annelid worms were through to have evolved from a coelomate worm-like ancestor which developed metameric segmentation or metamerism and the segments were termed as somites or metameres, sponges or porifera have a water transport or canal system. Water enters via minute pore(ostia) in the body wall into the central cavity spongocoel from where it goes out via osculum. The body of ctenophores bear eight external rows of ciliated comb plates which helps in locomotion.
 The name Cnidaria is derived from cnidocytes or cnidoblast that are found on the tentacles and body of the organism.
- 116.** Pneumatic bones are hollow bones found in birds, which enables them to fly. Neophron is a bird. Other options are incorrect because
 *Hemidactylus is a reptile.
 *Macropus is a mammal.
 *Ornithorhynchus is a mammal.
- 117.** The organism which eliminate their nitrogenous waste in the form of uric acid are uricotelic organism.
 To eliminate 1 gm uric acid = 10 ml H₂O is required. Therefore the waste excreted by ammonotelic organism are like thick solid paste called guano.
 Ammonotelic organism are birds, insects reptiles (terrestrial) snail etc.
- 118.** NCERT Pg. 55
 Last Paragraph, 1st line
- 119.** Crop and gizzard are additional chamber of digestive tract present in some annelids like earthworms, arthropods and some vertebrates like birds.
 Usually birds do not have teeth for chewing, thus gizzard acts as grinding chamber of food.

