4. Kingdom Animalia

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1. Choose correct option

A. Which of the following belongs to a minor phylum?

a. Comb jelly

b. Jelly fish

c. Herdmania

d. Salpa

B. Select the animal having venous heart.

a. Crocodile

b. Salamander

c. Rohu

d. Toad

C. In Ascaris_____,

a. mesoglea is present

b. endoderm is a discontinuous layer

c. mesoderm is present in patches

d. body cavity is absent

D. Which of the following is incorrect incase of birds?

a. Presence of teeth

b. Presence of scales

c. Nucleated RBCs

d. Hollow bones

E. Chitinous exoskeleton is a characteristic of _____

a. Dentalium

b. Antedon

c. Millipede

d. Sea urchin

2. Answer the following Questions:

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

Ans. Crocodile shows four-chambered heart.

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

Ans. Though Annelids are said to have closed circulatory system, it is not completely efficient closed circulation. The first phylum that can be said to have closed circulatory system is Mollusca. The molluscan cardiovascular system has evolved extensive vascular network with efficient centralized pumps (e.g., true hearts). This heart functions in integrated way with a variety of other physiological systems. The annelid circulatory system, though a low pressure system, contains contractile vessels for pumps and a highly branched vascular system. lacks an endothelial lining.
In Echinoderms the circulatory system is replaced by water vascular system. In all chordates it is closed circulatory system. Thus, Mollusca can be said to be the first phylum to have closed circulatory system.

(C) Pinna is part of external ear and it is found in mammals. Do Aves and reptiles show external ear in any form ?

Ans. Aves and reptiles do not show air pinna. But there is tympanum which represents the external ear.

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

Ans. Fish has gills. It exclusively breathes oxygen dissolved in water. It cannot breathe through skin, as the skin is covered over by exoskeleton made up of scales. Frog on the contrary does not have gills in adult condition. It breathes through skin when in water and with the lungs on land. When frog is in larval stage it has gills.

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

Ans. Bird bones are hollow within. They are also filled with air. These bones are called pneumatic bones. This helps the bird skeleton to be light. In this way the body weight is reduced.

(F) Cnidarians and Ctenophores are both diploblastic. Which other character do they have in common, which is not found in other Phyla ?
Ans. Cnidaria and Ctenophora both have blind sac body plan. Both have radially symmetrical body. Both of them show extra cellular and intra cellular digestion.

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

Ans. The protective covering of crab and snail is called exoskeleton. Crab's exoskeleton is made up of highly mineralized chitin-protein fibers. The shell of snail is largely made up of calcium carbonate with only 2 % proteins.

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

Ans. Sponge belongs to phylum Porifera. Sea star is better known as Star fish. It belongs to phylum Echinodermata. Porifera has calcareous protective material in the form of spicules and spongin fibres. The spicules are present inside the body in case of Porifera. Whereas Echinodermata have calcium carbonate in the form of calcareous ossicles which are present on the outer surface of the body. Thus they do not belong to the same phylum.

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

Ans. Fish scales are dermal i.e. they are formed differently. Fish scales are made of enamel and dentine. They can be detached individually from the skin. In most fish, the scales grow as the fish grows. The snake scales are epidermal. Reptilian scales are made of keratin, like hair, and found in an overlapping arrangement. Reptile scales can also be found in many colours to aid in camouflage or serve as warning to other organisms of their venomous nature. Snakes shed their skin in a single piece. The scales cannot be plucked out singly.

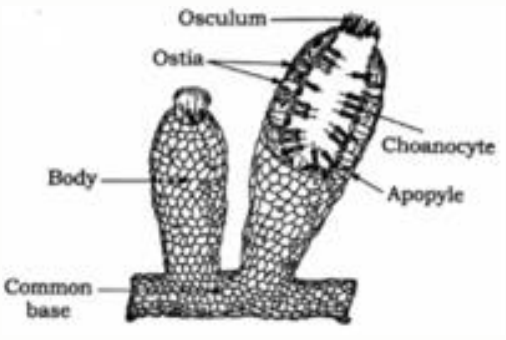
(J) Lower Phyla like Arthropods and Cnidarians show metamorphosis. Is it also found in any class of Phylum Chordata ?

Ans. The metamorphosis is distinctly seen in Amphibia which are included

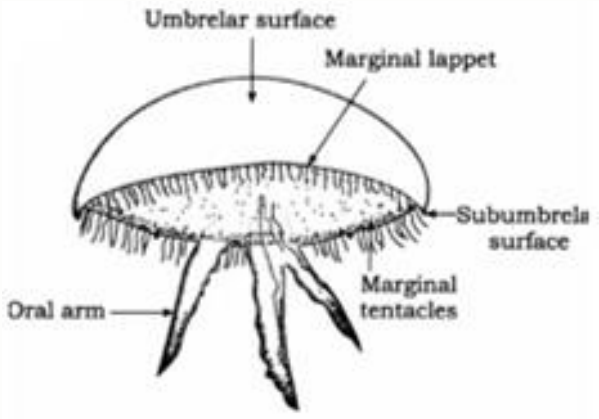
under Phylum Chordata.
Amphibia have aquatic larval stages with gills and tail, while adult amphibians is mostly terrestrial, tailless and without gills. This change in structure is possible due to metamorphosis. Metamorphosis is also seen in Urochordates when free swimming tailed larva converts itself into tailless adult with loss of notochord.

3. Draw neat labelled diagram:

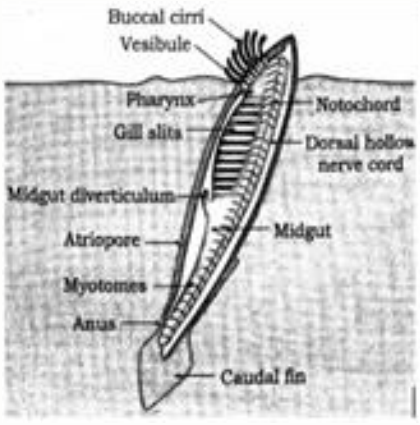
A. Sycon



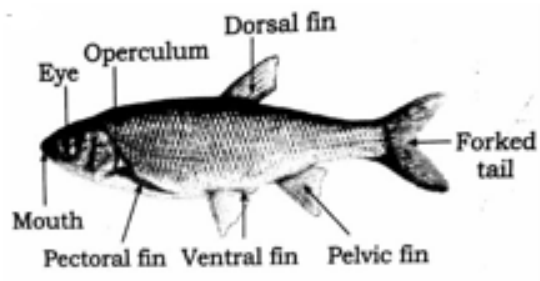
B. Aurelia



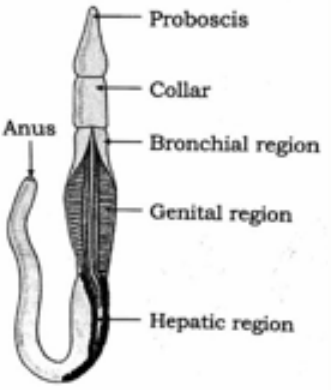
C. Amphioxus



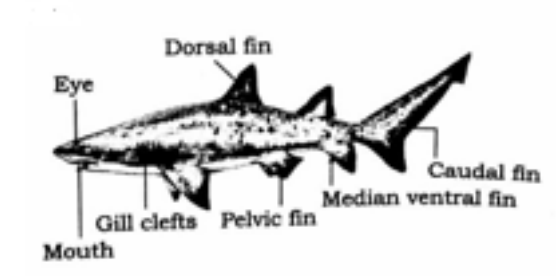
D. Catla



E. Balanoglossus



F. Scolidon



4. Match the following:

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

Ans: i. Annelida - d. Parapodia

ii. Mollusca - c. Radula

iii. Ctenophora - e. Comb plates

iv. Porifera - b. Ostia

v. Echinodermata - a. Tube feet

5. Identify the animal given in pictures and write features of its phyium/class.

(A)

Ans: This givan animal s Tomopter. It belongs to phylum Annelida.

Features:

(1) Animals belonging to phylum Annelida are worms with annuli or rings.

(2) They are bilaterally symmetrical true coelomates showing metamerically segmented soft, elongated and cylindrical body.

(3) Digestive system is complete with mouth and anus at opposite ends of the body.

(4) Locomotory organs are setae, parapodia or suckers. They have well developed layers of circular and longitudinal muscles which help in the movement of the body.

(5) Excretory organs are nephridia which is a characteristic feature of annelids.

(6) Respiration takes place through the body surface, Circulatory system is of closed type. Haemoglobin is dissolved in plasma.

(7) The nervous system is in the form of nerve ring and ganglionated nerve cord.

(8) The reproductive system well developed. Animals are mostly hermaphrodite. Few are unisexual

(9) Leech (a sanguivorous annelid), Nereis, earthworm, Aphrodite, etc. are the examples of
Annelida.

(B)

: Ans. The given animal is Eel which is a bony fish, Osteichthyes.

(1) Osteichthyes is a class under superclass Pisces.

(2) It includes bony fishes. The endoskeleton is bony and scales are of cycloid, ctenoid type.

(3) These are exclusively aquatic, seen in both fresh and marine waters.

(4) Mouth is mostly terminal in position.

(5) There are two dorsal fins and a tail fin is formed by two equal lobes. Such tail fin is called homoceral or symmetrical fin.

(6) Four pairs of gill slits covered with operculum are seen.

(7) There is air bladder which gives buoyancy to the fish during swimming.

(8) Fertilization is external therefore there are no copulatory organs such as claspers.

(9) They are oviparous. E.g. Fresh water fishes such as Rohu, Catla, Magur etc. and marine fishes such as Bombay duck, Pomfret and aquarium fishes such as Betta (fighting fish), Pterophyllum (Angel fish). Peculiar fishes are Exocoetus (flying fish), Hippocampus (sea-horse).

(C)

Ans. The given animal is Dolphin, belongs to class Mammalia and order Cetacea.

Features

(1) Mammalia are highly evolved animals having mammary glands through which the young one is nourished.

(2) They are seen in all regions and all habitats. Thus, they are called omnipresent.

(3) Majority are terrestrial, order Cetaceans are aquatic while few like bats are aerial. Monkeys and some other smaller mammals are arboreal.

(4) They have two pairs of limbs for locomotion which are used for walking, flying, climbing, burrowing, swimming, etc.

(5) Body divisions are head, neck, trunk and tail.

(6) They maintain their body temperature to a constant level and hence are called homeotherms.

(7) Exoskeleton is in the form of hair, fur, nails, hooves, horns, etc. Skin is glandular with sweat glands and sebaceous or oil glands. Mammary glands are modified sweat glands.

(8) They have external ear (pinna). They have heterodont dentition.

(9) RBCs are biconcave and enucleated. Blood is red in colour due to haemoglobin. Ventral heart which is four chambered.

(10) Respiration takes place by lungs.

(11) Brain is highly developed with cerebrum that has transverse band called corpus callosum.

(12) Most of the mammals are viviparous, i.e. they give birth to live young. E.g. Human, cat, dog, tiger, bat, dolphins, whale etc. Few are oviparous (e.g.

Duck billed platypus) while Marsupial have pouches for the completion of development of young ones. Of Kangaroo.

(D)

Ans: The given animal is Snake, belongs to class Reptilia.
Features:

(1) Animals belonging to class Reptilia are creeping animals, as their limbs are small and underdeveloped as compared to their bulky bodies, hence the name, Reptilia. Limbs have well developed pentadactyl digits and claws.

(2) They are first true terrestrial vertebrates. Some reptiles, for example, turtle, sea snake, crocodile are aquatic. They are unable to breathe in water. They breathe in aerial oxygen. Thus respiration is by lungs.

(3) They are cold blooded or poikilothermic. The skin is dry, scaly without any oil glands. The exoskeleton is of epidermal scales or plates or scutes.

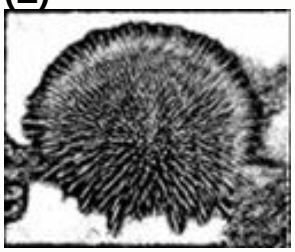
(4) External ear is absent. Olfactory lobes and cerebellum are better developed than amphibians.

(5) The heart is ventral, three-chambered with two auricles and a single ventricle, but in some, like crocodiles and tortoise the heart is four chambered. The circulatory system is of closed type.

(6) Sexes are separate with prominent sexual dimorphism and males show copulatory organs. Fertilization is internal and animals show oviparous mode. Little parental care is seen. (Viper is an exception as it shows pseudo viviparity.)

(7) Examples Snakes such as cobra, viper, etc, crocodile, turtle, wall lizard, garden lizard, etc.

(E)



Ans. The given animal is Sea urchin belongs to phylum Echinodermata.
Features:

(1) Echinodermata is the exclusively marine phylum which has solitary, sedentary or free-living and gregarious, benthic animals.

(2) Radially symmetrical with pentamerous symmetry is the most important distinguishing character. Body shows spherical, elongated shape or is star shaped.

(3) Endoskeleton of calcareous ossicles with spines present on the body, hence they are called Echinodermata.

(4) The body does not have definite body divisions, instead, there are oral and aboral sides.

(5) Presence of water vascular system in which water enters through madreporite. This system is used in locomotion, food capturing, respiration, etc.

(6) Digestive system is complete with ventral mouth on oral surface and anus on aboral surface.

(7) Respiration is carried out by peristome gills, papillae, respiratory tree, etc.
(8) Circulatory system and excretory system is absent.
(9) Nervous system is simple with a nerve ring around mouth and radial nerves in the arms.

(10) Sexes are separate, rarely bisexual, external fertilization with direct or indirect development, high regeneration power seen in some.
E.g. Star fish, brittle star, sea urchin, sea cucumber, etc.

(F)

Ans. The given animal is Flying lizard, Draco belongs to class Reptilia.
Features:

(1) Animals belonging to class Reptilia are creeping animals, as their limbs are small and underdeveloped as compared to their bulky bodies, hence the name, Reptilia. Limbs have well developed pentadactyl digits and claws.

(2) They are first true terrestrial vertebrates. Some reptiles, for example, turtle, sea snake, crocodile are aquatic. They are unable to breathe in water. They breathe in aerial oxygen. Thus respiration is by lungs.

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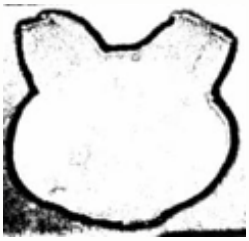


Ans. The given animal is Herdmania belongs to subphylum Urochordata

Features:

(1) Urochordata is the subphylum of phylum chordata.

(2) They are commonly known as tunicates or ascidians.

(3) The entire subphylum shows exclusively marine.

(4) Body is soft and covered by 'test' or 'tunic' which is made up of tunicine.

(5) Chordate characters such as notochord and gill slits are present.

(6) Notochord is seen only in the tail of larva, hence the name, urochordata. This is
lost during metamorphosis.

(7) Pharynx has many gill slits.

(8) Closed circulatory system is present. Development is indirect.
E.g. Herdmania, Salpa, Doliolum.

(H)

Ans: The animal give is Nautilus belongs to phylum Mollusca.
Features:

(1) Animals belonging to phylum Mollusca are soft bodied, living as free swimming or as sedentary animals.

(2) They are mostly marine, benthic (living at the bottom) or pelagic (floating in the water column) with either asymmetrical or bilaterally symmetrical body having tube within the tube plan.

(3) The body is divisible into head, foot and visceral mass. Thick muscular fold of body wall called mantle is present which encloses the entire visceral mass.

(4) Shell is hard and calcareous which is secreted by mantle. In some animals shell is internal while in majority it is external. The foot is highly modified for locomotion.

(5) The digestive system is complete with mouth and anus. The alimentary canal is U-shaped due to torsion by side. Radula with transverse rows of teeth is present in the buccal cavity.

(6) In aquatic forms, ctenidia or gills are present for performing respiration. In terrestrial forms, lungs are present.

(7) The circulatory system is open and haemocyanin is the blood pigment which makes the blood bluish.

(8) The excretion is by a pair of kidneys, also called organs of Bojanus.

(9) The nervous system has three pairs of ganglia, cerebral ganglia in head region, pedal ganglia in foot region and visceral ganglia in visceral mass. Between the ganglia there are connectives and commissures. The sense organs such as eyes for vision and osphradia for testing purity of water and tentacles for tactile sensation are present.

(10) Sexes are separate and animals are oviparous. Development is direct or indirect.

(11) Examples of Mollusca are Snail, Unio, Pila, Dentalium, Sepia, Chiton, etc.

(I)

Ans: The given animal is Amphioxus. It belongs to subphylum Cephalochordata.
Features:

(1) Cephalochordata is the subphylum under phylum Chordata.

(2) They are exclusively marine.

(3) Commonly known as lancelet, they are small fish like animals of less than 5 cm.

(4) These animals are partly burried in soft marine sediments.

(5) The chordate characters in them are

(a) Notochord that extends throughout the length of body and which persists for entire life.

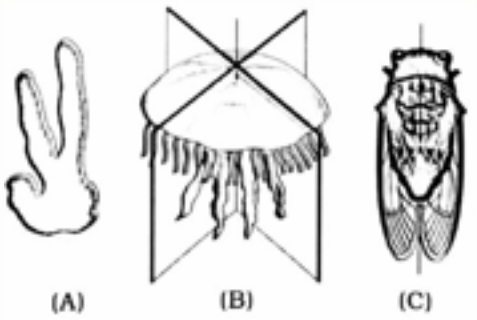
(b) Presence of pharyngeal gill slits.

(c) Post-anal tail

(6) Myotomes or muscle blocks are present which is a distinguishing character of this group.

(7) Closed circulatory system is present. (8) Blood does not have any respiratory pigment. E.g. Branchiostoma (Amphioxus or Lancelet).

8. Observe and identify body symmetry of given animals.



Ans. The body symmetry given in the above Diagram is (A) asymmetrical.(B) radially Symmetrical and (C) bilaterally symmetrical respectively.