



BIOLOGY

DIVERSITY OF ANIMAL LIFE

Protozoa to Chordate up to mammalia

Dr. SIDDARAJU M. M.Sc., P.M.D.S., Ph.D.

Selection grade lecturer in Biology

Sri Sathya Sai Loka Seva

P.U. College Alike

Bantwal Tq D.K. 574243.

Phylum Protozoa(Protista):

Unicellular, microscopic organisms with a protoplasmic grade of organization.

contractile vacuoles for osmoregulation

Locomotory organelles include flagella, pseudopodia and cilia

Elimination of wastes like ammonia by diffusion

Rhizopoda- Amoeba

Flagellata- Eugleena

Ciliata- Paramecium

Sporozoa- Plasmodium



Phylum Porifera:(Sponges)

- Multicellular, pore bearing organisms with cellular grade of organization.
- characterized by unique flagellate cells called collar cells or choanocytes, pinnacocytes, spicules, canal system
- Intracellular digestion.
- Reproduction is by budding or gemmule formation.
- larval stage called amphiblastula or parenchymula.
- Great power of regeneration

Calcarea- Sycon

Hexactinellida- Euplectlla

Demospongiae- Spogilla



Phylum- Coelenterata:

- Diploblastic (mesoglea in between ectoderm & endoderm).
- Radially symmetrical organisms with tissue grade of organization.
- The epidermis has unique cnidoblasts (Stinging cells), used in capturing food.
- They possess gastro vascular cavity (coelenteron).
- They exhibit polymorphism (Many morphological features in a single individual) & alternation of generation.



Hydrozoa- Hydra

Scyphozoa- Aurelia

Anthozoa- Fungia



Phylum Platyhelminthes (Flat worms):

- Triploblastic, dorsoventrally flattened, bilaterally symmetrical, acoelomate animals with organ grade of body organization. Hermaphrodites
- They are characterized by incomplete digestive system.
- Flame cells or solenocytes or protonephridia for excretion. Ladder like nervous system.



Turbellaria- Planaria

Trematoda- Fasciola

Cestoda- Taenia

Phylum Aschelminthes :(Round worms):

- This includes an important class Nematelminthes, which are characterized by pseudocoel, well developed digestive and nervous system.
- These are unsegmented, bilaterally symmetrical triploblastic animals.
- Unisexual, males are smaller than females.
- Eg: *Ascaris lumbricoides*(intestinal round worm),
Ancylostoma duodenale (Hook worm)
Wuchereria bancrafti (filarial worm)

Phylum Annelida:

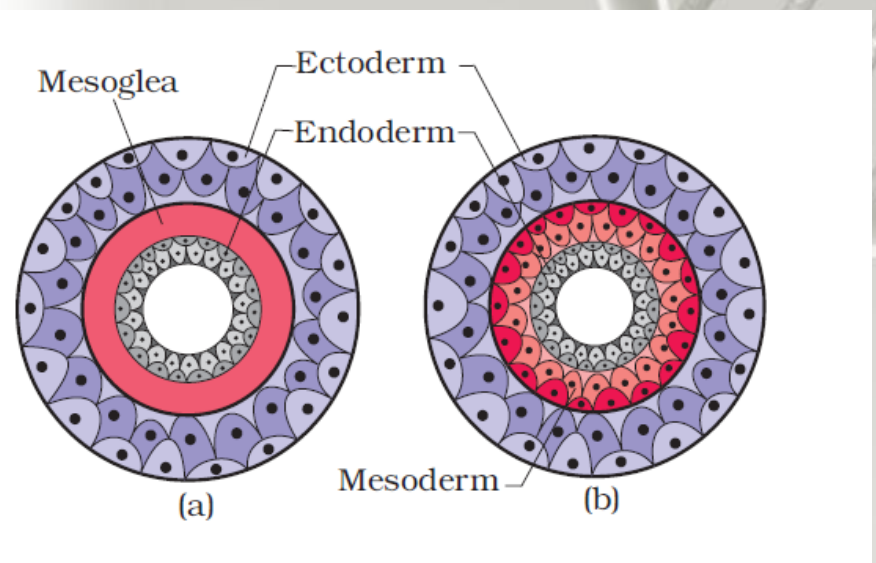
- Triploblastic, bilaterally symmetrical, metamerically segmented coelomates. They possess paired parapodia & setae for locomotion,
- Paired nephridia for excretion & closed vascular system.
- Hermaphrodites, The development may include a larval form called trochophore.

Polychaeta- Neries

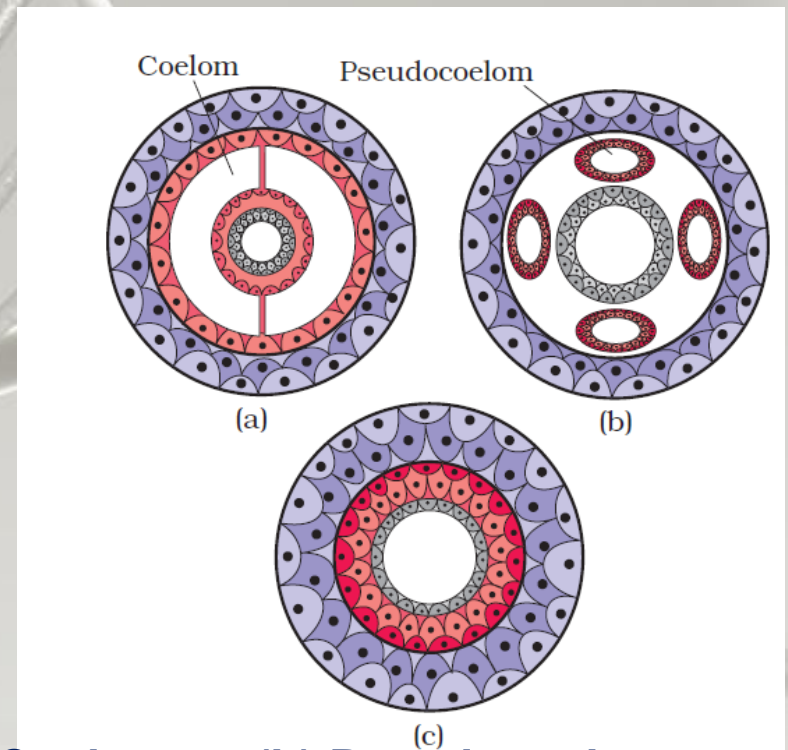
Oligochaeta- Pheritima

Hirudinea - Hirudinaria





(a) Diploblastic (b) Triploblastic



(a) Coelomate (b) Pseudocoelomate (c) Acoelomate

Phylum Arthropoda: (Largest phylum):

- **Body is divided into head, thorax & abdomen.**
- **They have chitinous exoskeleton, haemocoel, open vascular system**
- **Malphigian body or green gland or antennary glands for excretion**
- **Bilaterally symmetrical, segmented & jointed legged animals.**

**Onychophora-
Peripatus**

**Crustacea-
Penaeus**

Insecta-Musa

**Diplopoda-
Julus**

**Chilopoda-
Centipedes**

**Arachnida-
Scorpions**



Phylum Mollusca:

- They are bilaterally symmetrical, unsegmented, soft bodied animals.
- The body is covered by fleshy outgrowth called mantle.
- They have shell, muscular foot, radula (rasping organ), ctenidia for respiration, open vascular system except cephalopods.
- The development may include a ciliated larval form called trochophore and veliger.

Monoplacophora-
Neopilina

Polyplacophora-
Chitons

Scaphopoda-
Dentalium

Gastropoda- Pila

Lamellibranchiata-
Lamellidens

Cephalopoda-
Octopus

Phylum Echinodermata:

- These are radially symmetrical, larvae are bilaterally symmetrical unsegmented, spiny skinned exclusively marine forms.
- They possess a unique system of tubes called the water vascular system with bulb like structures called tube feet.
- The ambulacral system serves as a organ for locomotion, food capture & respiration.
- Some have the ability of regeneration.

Asteroidea-
Astropecten

Ophiuroidea-
Ophiothrix

Holothuroidea-
Cucumaria

Echinoidea-
Echinus

Crinoidea-
Antedon



Phylum Chordata:

- The fundamental features that occur in developmental stages of all chordates are:
- a) Notochord,
- b) Nerve cord (dorsal tubular) and
- c) Gill slits in the pharynx.

Hemichordata- Urochordata - Cephalochordata-

(Balanoglossus) (Sea squirts) (Branchiostoma)

Cephaldiscus

Ascidian

Amphioxus

Vertebrata

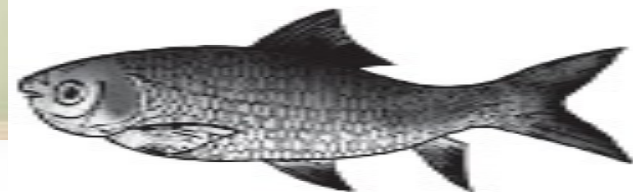
Agnatha

Gnathostomata

Jawless-Lampreys With Jaws

Super class: Pisces

- **Chondrichthyes:** (Cartilagenous) These are characterized by ventral mouth, ventral nostril, 5 to 7 exposed gills clefts, and placoid scales in skin, cloaca, internal fertilization & absence of hydrostatic organs. Exclusively marine
- **Ex:** *Scoliodon* (shark), *Trygon* (Sting ray), *Narcine* (Electric ray), *Sphryna* (Hammer headed shark)
- **Osteichthyes (Bony fishes):** These are characterized by terminal mouth, dorsal nostril, operculum, hydrostatic organ, absence of cloaca, ctenoid scales in the skin.
- **Ex:** *Echeneis* (sucker fish), *Anguilla* (eel), Hippocampus (sea horse), *Exocoetus*.



Super Class: Tetrapoda

Class Amphibia: They live in water & on land.

- They are poikilothermic tetrapods characterized by soft, glandular, slimy and moist skin without scales, 3 chambered heart. Cloaca is present
- 1. **Anura** (Tailless amphibians) - Frogs and toads
- 2. **Apoda** (limbless amphibians or caecilians) - Ichthyophis
- 3. **Urodela** (tailed amphibians) - Salamanders.



Class Reptilia:

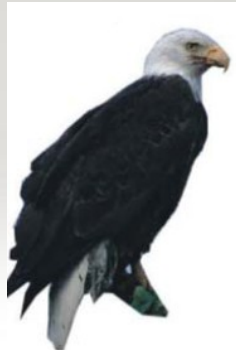
- **Cold blooded terrestrial creeping vertebrates.**
- **They possess dry scaly skin(scute), bearing an exoskeleton of horny scales, ecdysis or moulting of scales**
- **lungs for respiration, kidneys to excrete uric acid.**
- **3 chambered heart (Crocodile incompletely 4 chambered heart).**



**Turtles,
Lizards,
Snakes,
Crocodiles**

Class Aves:

- Warm blooded aerial vertebrates with spindle shaped body & toothless beak.
- They have pneumatic (Light) bones,
- syrinx or voice box, 4 chambered heart.
- Forelimbs are modified into wings.
- Body is covered by exoskeleton of feathers.



Ostrich, Rhea, Emu, Kiwi (Flightless birds) & Corvus (crow), Columba (pigeon), Pavo (peacock), Psittacula (parrot), Neophron (vulture), Flying birds.

Class Mammalia:

- Body is covered by hair.
 - Pinnae are present.
 - Presence of functional mammary glands in females which secrete milk to nourish the young ones.
 - Presence of muscular diaphragm that separates thoracic cavity and abdominal cavity.
 - 4-chambered heart & non-nucleated RBCs.(except camel)
- **Prototheria** (egg laying mammals)
Ornithorynchus (Duck billed platypus)
 - **Metatheria** (pouched mammals) Eg- kangaroo, koala bear
 - **Eutheria** (Placental mammals): It has several orders

Eutheria:

- 1) Insectivora: *Shrew.*
- 2) Chiroptera: *Bats.*
- 3) Primates: *Lemurs.*
- 4) Edentaata: *Sloths.*
- 5).Rodentia:*Rats.*
- 6) Pholidota: *Manis.*
- 7) Lagomorpha: *Rabbits.*
- 8) Cetacea: *Whales.*
- 9) Carnivora: *Dogs, Foxes.*
- 10) Serinia: *Manatees.*
- 11) Perissodactyla: *Horses.*
- 12) Artiodactyla: *Cattle.*
- 13) Proboscida: *Elephant.*
- 14) Dermoptera: *Flying lemurs.*
- 15) Tubelidentata: *Earth pig.*
- 16) Hydracoidea: *Hydranus.*



Q. 1. *Entamoeba histolytica* is a human parasite usually found in:

- 1) Liver**
- 2) Intestine**
- 3) Mouth**
- 4) Lung**



Q. 2. Which term is NOT associated with sponges?

- 1) Medusa**
- 2) Gemmules**
- 3) Choanocytes**
- 4) Spicules**

Q. 3. The portion lying between the coelom and the gut:

- 1) gastric**
- 2) coelomic**
- 3) somatic**
- 4) splanchnic**

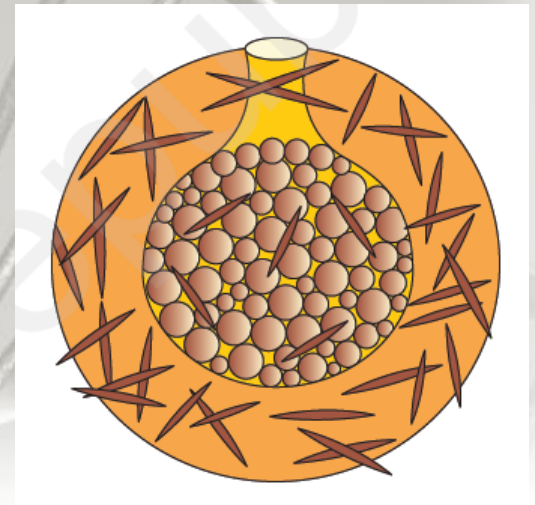
Q. 4. A cnidocil is a:

- 1) modified cilium or microvillus**
- 2) a type of nematocyst**
- 3) a marginal veil on the subumberlla**
- 4) a type of cnidae**



Q. 5. Which one of the following characteristics does not apply to the phylum Cnidaria?

- 1) Radially symmetrical**
- 2) Mesoglea**
- 3) Alternation of generations**
- 4) Spicules**



Q. 6. A parapodium is

- 1) a type of flagellum found on annelid larvae**
- 2) a lateral extension of the body wall used in locomotion**
- 3) a sensory organ found on the prostomium**
- 4) a type of protective scale covering the body of polychaetes**



Q. 7. Which of the following is a feature not shared by both Annelida and Arthropoda?

- 1) Metameric segmentation.**
- 2) Ventral nerve cord.**
- 3) Blood flows anteriorly in the dorsal blood vessel**
- 4) No backbone.**

Q. 8. Nitrogenous excretion in crustaceans involves which of the following pairings of material and organ?

- 1) Ammonia and gill or antennal gland**
- 2) Urea and gill.**
- 3) Uric acid and malphigian tubules.**
- 4) Ammonia and malphigian tubules**

Excretion of ammonia occurs primarily by diffusion across thin areas of the cuticle and gills. Green/antennal or maxillary glands depending on where they open at are paired tubular structures for excretion. crustaceans lack Malpighian tubules

Q. 9. Which of the following are wing-bearing segments in insects?

- 1) Prothorax and mesothorax.**
- 2) Mesothorax only.**
- 3) Mesothorax and metathorax.**
- 4) Prothorax, mesothorax and metathorax.**



Q. 10. The notochord is most closely associated with the

- 1) nervous system**
- 2) spinal cord**
- 3) skeletal system**
- 4) skin system**

Q. 11. Which of the following statements is false?

- 1) All vertebrates have a ventral nerve cord.**
- 2) All vertebrates have a tail at some stage in their life cycle.**
- 3) All vertebrates have a notochord at some stage in their life cycle.**
- 4) All vertebrates have pharyngeal gill slits at some stage in their life cycle.**

Q. 12. The "tunic" of tunicate refers to

- 1) a body covering**
- 2) the type of food-gathering mechanism**
- 3) muscle arrangements in the larva**
- 4) the protective cover of the brain**



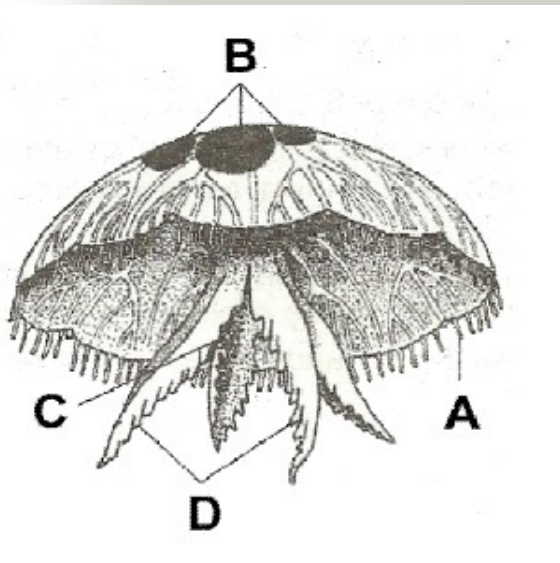


BIOLOGY

Q. 13. Sharks, rays, and skates belong to what group?

- 1) Birds**
- 2) Amphibians**
- 3) Cartilaginous fish**
- 4) Bony fish**

Q. 14. In the diagram of the *Aurelia* given below. Certain parts have been indicated by alphabets, choose the answer in which these alphabets have been correctly match with the parts which they indicate.



- 1) A=Gonads, B=Tentacle, C=Mouth, D=Oral arms
- 2) A= Tentacle, B= Gonads, C=Mouth, D=Oral arms
- 3) A= Mouth, B= Oral arms, C= Tentacle, D= Gonads
- 4) A= Oral arms, B=Mouth, C=Gonads, D= Tentacle

Q. 15. Match the following

Column I		Column II	
A	Birds	i	swim bladder for buoyancy
B	Bony fishes	ii	endothermic with feathers
C	Caecilians	iii	placental mammal
D	Humans	iv	modern-day parasitic jawless fish
E	Lampreys	vi	legless amphibian

- 1) A=ii, B=i, C=iv, D=iii, E=v.
- 2) A=ii, B=i, C=v, D=iv, E=iii.
- 3) A=ii, B=i, C=iii, D=v, E=iv.
- 4) A=ii, B=i, C=v, D=iii, E=iv.

- EXPLANATION:**
- 1) birds -- endothermic with feathers
 - 2) bony fishes -- swim bladder for buoyancy
 - 3) caecilians-- legless amphibian
 - 4) humans -- placental mammal
 - 5) lampreys -- modern-day parasitic jawless fish

Q. 16. Match the following

Column I		Column II	
A	Platypus	i	adult is called "sea squirt"
B	Salamanders	ii	limbless reptile
C	Sharks	iii	may be sexually mature but not adult
D	Snakes	1v	cartilaginous skeleton
E	Tunicates	vi	egg-laying mammal

- 1) A=v, B=iii, C=ii, D=iv, E=i.
- 2) A=v, B=iii, C=iv, D=i, E=ii.
- 3) A=v, B=iii, C=iv, D=ii, E=i.
- 4) A=iii, B=v, C=iv, D=ii, E=i.

EXPLANATION:

- 1. platypus -- egg-laying mammal
- 2. salamanders-- may be sexually mature but not adult
- 3. sharks - cartilaginous skeleton
- 4. snakes -- limbless reptile
- 5. tunicates -- adult is called "sea squirt"

Q. 17. The insects are able to survive on land in almost any environment due to;

- 1) a tough covering on the body**
- 2) impermeability to water**
- 3) presence of a chitinous cuticle**
- 4) All the above features**

Q. 18. Earthworms and Leechs are the representative of the phylum;

- 1) Cnidaria**
- 2) Platyhelminthes**
- 3) Aschelminthes**
- 4) Annelida**

Q. 19. In which of the following organisms, self fertilization observed?

- 1) Liverfluke**
- 2) Fish**
- 3) Earthworm**
- 4) Roundworm**



Q. 20. Match the column I with column II and choose the correct option

Column I		Column II	
A	Amphibia	i	Air bladder
B	Mammals	ii	Cartilagenous notochord
C	Chondrichthe s	iii	Mammary glands
D	Osteichthes	1v	Pneumatic bones
E	Cyclostomata	vi	Dual habitat
F	Aves	vii	Sucking and circular mouth without jaws

- 1) A=i, B=iii, C=ii, D=v, E=vi, F=iv.
- 2) A=v, B=iii, C=ii, D=i, E=vi, F=iv.
- 3) A=v, B=iii, C=ii, D=vi, E=i F=iv.
- 4) A=v, B=ii, C=iii, D=i, E=vi, F=iv.

EXPLANATION:

Amphibia- Dual habitat

Mammals- Mammary glands

Chondrichthes- Cartilagenous notochord

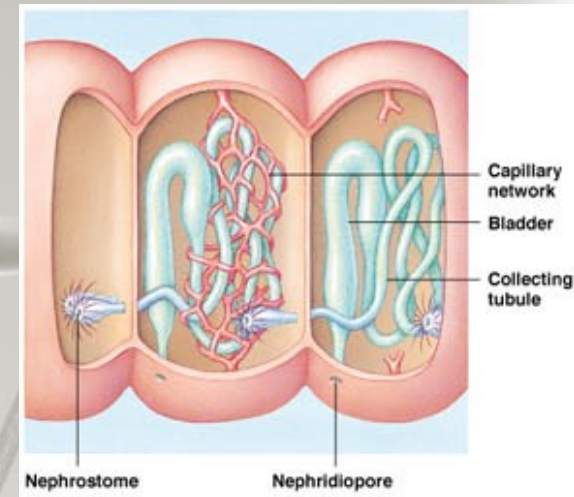
Osteichthes- Air bladder

Cyclostomata- Sucking and circular mouth without jaws

Aves- Pneumatic bones

Q. 21. Excretory organs of an earthworm are

- 1) Nephridia**
- 2) Flame cells**
- 3) Malphigian tubules**
- 4) Green glands**

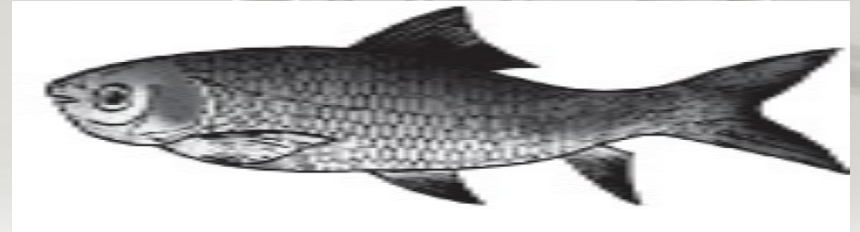
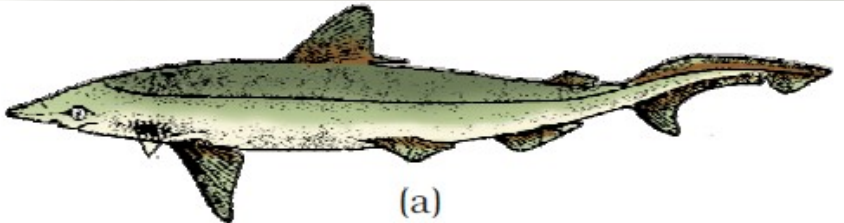


Q. 22. Cartilage fishes do not contain

- 1) fins**
- 2) gill cover**
- 3) Scales**
- 4) mouth**

Q. 23. Chondrichthyes can be differentiated from osteichthyes externally by

- 1) naked gills**
- 2) heterocercal tail**
- 3) ventral mouth**
- 4) all the above**

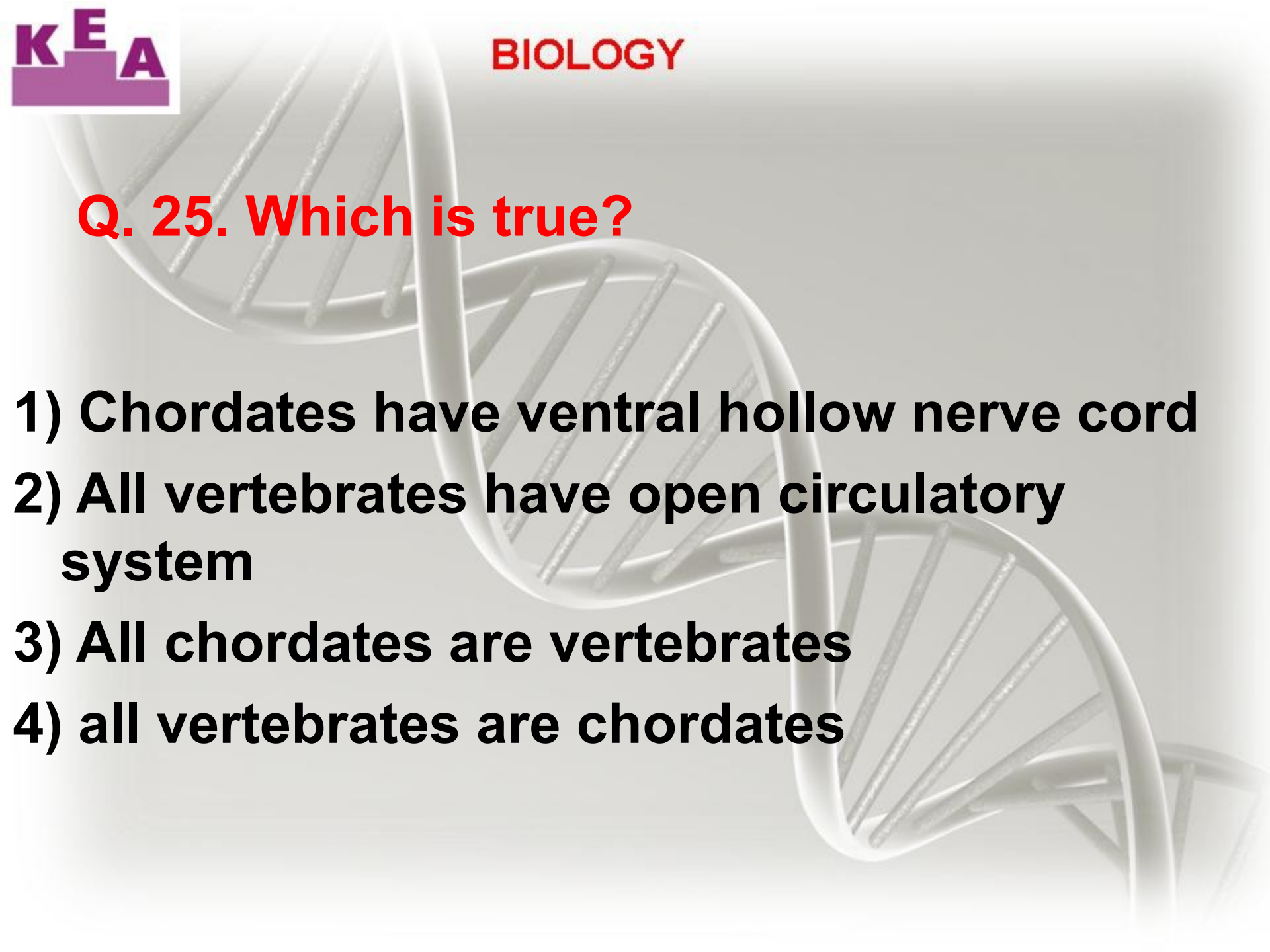


Q. 24. Heart of fishes

- 1) one chambered**
- 2) two chambered and mixed**
- 3) two chambered and venous**
- 4) three chambered and mixed**

In fishes the heart pumps out deoxygenated blood which is oxygenated by the gills and supplied to the body parts from where deoxygenated blood is returned to the heart (single circulation).

Q. 25. Which is true?

- 
- A large, semi-transparent, light grey DNA double helix is shown in the background, winding across the slide from the top left towards the bottom right. The helix is rendered with a soft glow and is slightly out of focus, serving as a decorative element for the biology-themed presentation.
- 1) Chordates have ventral hollow nerve cord**
 - 2) All vertebrates have open circulatory system**
 - 3) All chordates are vertebrates**
 - 4) all vertebrates are chordates**

Q. 26. Bats have echolocation property. The other animals with this property are

- 1) Turtles and crocodiles**
- 2) Birds and snakes**
- 3) Frogs and Salamanders**
- 4) Dolphins and Whales**

Q. 27. Animals which do not have a constant body temperature are called

- 1) Athermic**
- 2) Endothermic**
- 3) Homothermic**
- 4) Poikilothermic**

Q. 28. Which invertebrate phylum possess following features Bilateral symmetry, *triploblastic, metamerism*, open vascular system, sexual dimorphism

- 1) Annelida**
- 2) Mollusca**
- 3) Arthropoda**
- 4) Aschelminthes**

Q. 29. Which of the following possess vertebral column?

- 1) Petromyzon**
- 2) Herdmania**
- 3) Amphioxus**
- 4) Balanoglossus**

Q. 30. Choose the correct statement from the following

- 1) All triploblastic animals possess coelom**
- 2) All coelenterates are triploblastic**
- 3) All nematods possess false coelom**
- 4) All acoelomates are diploblastic**

Q.31. Amphibians are most dependent on an aquatic environment for

- 1) Respiration**
- 2) Feeding**
- 3) Reproduction**
- 4) Urination**

Q. 32. Amphibians can use which of the following for gas exchange?

- 1) gills**
- 2) lungs**
- 3) Skin**
- 4) all of the above**

Q. 33. In which group are retention of larval characteristics and sexual maturity seen in the same body?

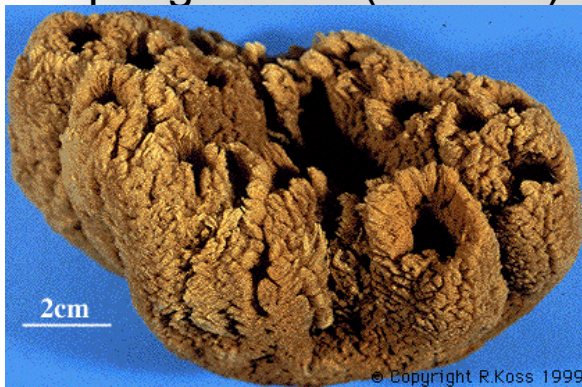
- 1) Toads**
- 2) Salamanders**
- 3) Frogs**
- 4) Caecilians**



Q. 34. Which one is bath sponge ?

- 1) Sycon**
- 2) Chaline**
- 3) Euspongia**
- 4) Spongilla**

Spongin fibres(network)



Q. 35. Which of the following is a glassy transparent sponge used for decoration purpose.

- 1) Hyalonema**
- 2) Bath sponge**
- 3) Leucosolenia**
- 4) Euplectella**



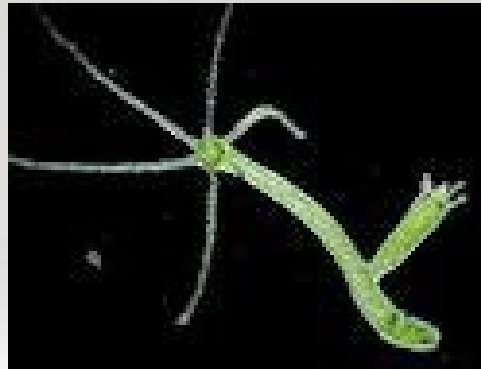
Q. 36. Corals are formed by

- 1) Molluscs**
- 2) Coelenterates**
- 3) Protozoans**
- 4) Echinoderms**



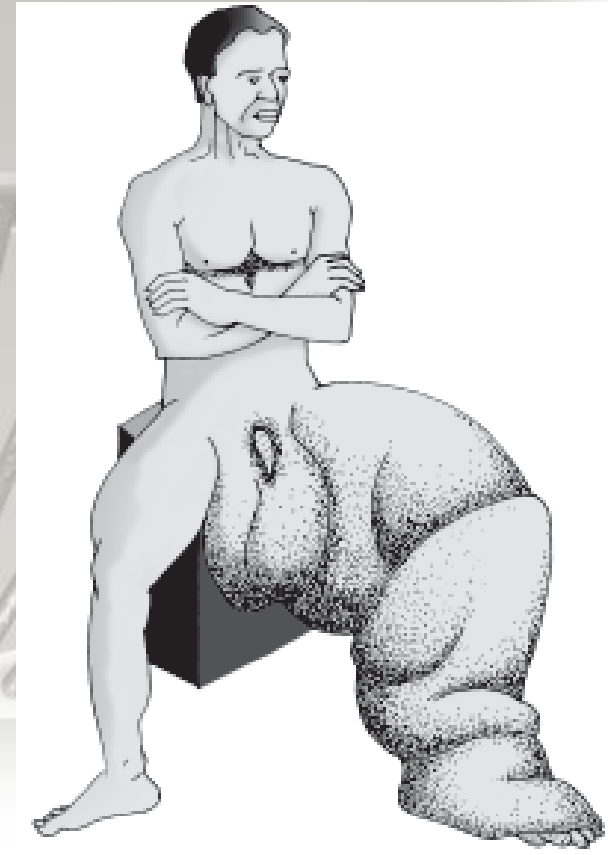
Q. 37. Hydra is

- 1) Fresh water, diploblastic & radially symmetrical
- 2) Marine, diploblastic & radially symmetrical
- 3) Marine, triploblastic & bilaterally symmetrical
- 4) Fresh water, triploblastic & radially symmetrical



Q. 38. Disease filariasis is caused by

- 1) *Fasciola***
- 2) *Wuchereria***
- 3) *Taenia***
- 4) *Ascaris***



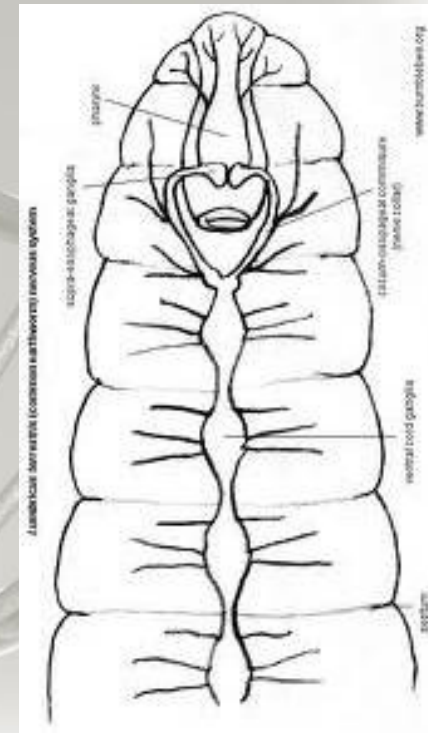
Q. 39. The posterior end of male *Ascaris* remains

- 1) Cylindrical**
- 2) Spiral**
- 3) Straight**
- 4) Curve**



Q.40. What is common between earthworm, leech & centipede

- 1) They have malphigian tubules
- 2) They are hermaphrodite
- 3) They have ventral nerve cord
- 4) They have no legs



Q. 41. Ecdysis is not found in

- 1) Insects**
- 2) Polychaetes**
- 3) Snakes**
- 4) Cockroach**

Q. 42. Pearl oyster belongs to

- 1) Gastropoda**
- 2) Cephalopoda**
- 3) Scaphapoda**
- 4) Pelecypoda**

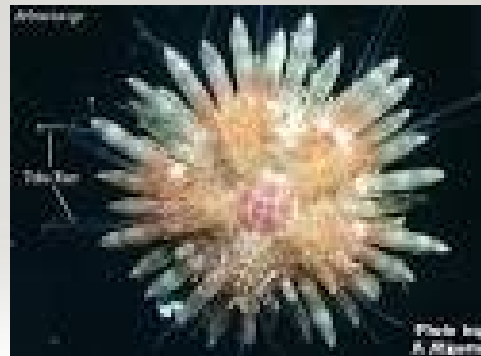


Q. 43. Shell of Mollusca is derived from

- 1) Foot**
- 2) Mantle**
- 3) Ctenidium**
- 4) Placoid**

Q. 44. The name Echinoderm literally means

- 1) Soft Skinned.**
- 2) Hard Skinned**
- 3) Spiny Skinned**
- 4) Calcarious Skinned.**



Q. 45. Which of the following group of animal found only in sea

- 1) Porifera**
- 2) Echinodermata**
- 3) Protozoa**
- 4) Cestoda**

Q. 46. All the vertebrates are

- 1) Unisexual**
- 2) Bisexual**
- 3) Both a & b**
- 4) None of these**

Hagfishes(Myxine)-
Agnatha are hermaphrodite



Q. 47. Which of the following is not Protochordate

- 1) Herdmania**
- 2) Amphioxus**
- 3) Ascidia**
- 4) Petromyzon**

EXPLANATION:

- 1) Herdmania -Urochordata
- 2) Amphioxus -Cephalochordata
- 3) Ascidia - Urochordata
- 4) Petromyzon –vertebrata(Agnatha)



Q. 48. Why *Amphioxus* considered as degenerate chordates?

- 1) Due to absence of distinct head**
- 2) Due to absence of brain**
- 3) Due to absence of kidney**
- 4) Due to all above characters**



Q. 49. Match the following**Column-I**

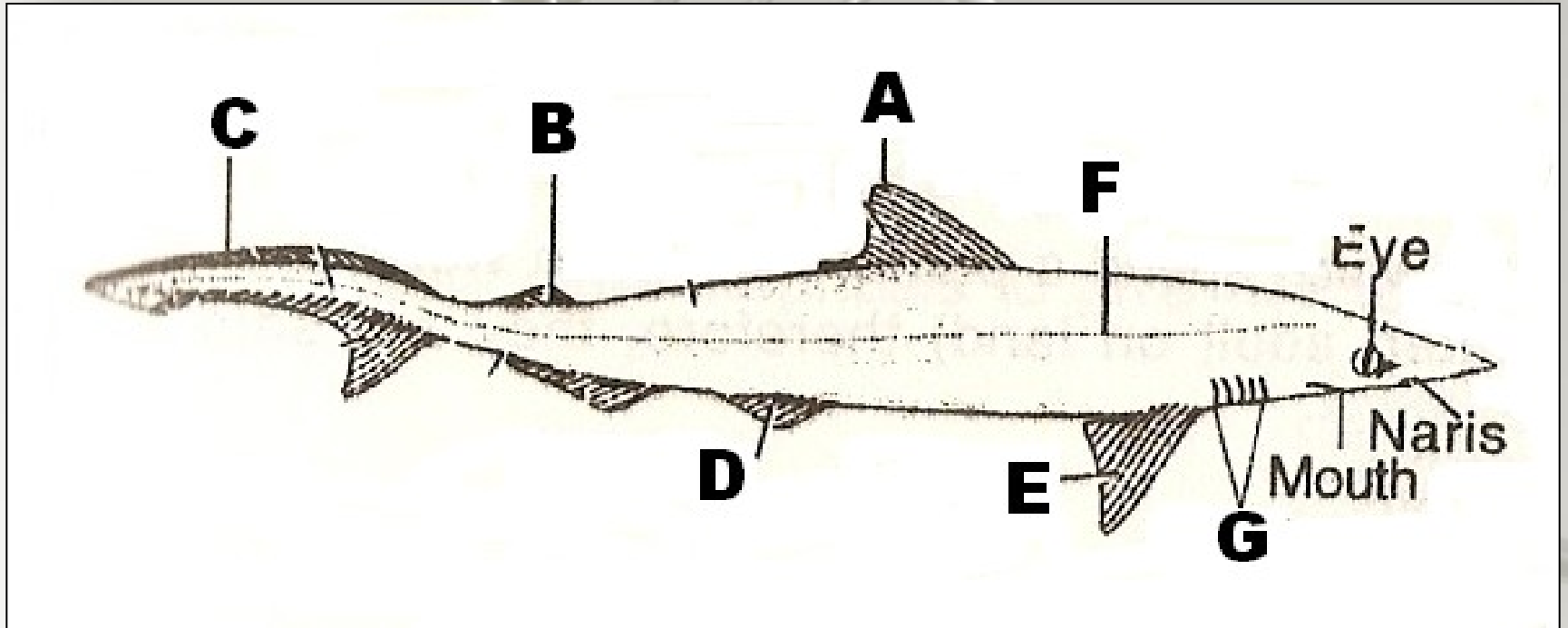
- A) Cyclostomata**
- B) Chondrichthyes**
- C) Osteichthyes**
- D) Gnathostomata**

Column-II

- p) bony fishes**
- q) Jawless vertebrates**
- r) Cartilage fishes**
- s) Jaws possessing vertebrates**

- 1) A-s, B-r, C-q, D-p**
- 2) A-s, B-q, C-p, D-r**
- 3) A-q, B-p, C-r, D-s**
- 4) A-q, B-r, C-p, D-s**

Q. 50. In the diagram of shark different parts are indicated by alphates. Choose the correct combination



- 1) A-1st dorsal fin, B-2nd dorsal fin, C-Heterocercal tail, D-Pelvic fin, E-pectoral fin, F-lateral line, G-gills**
- 2) A-1st dorsal fin, B-2nd dorsal fin, C-Heterocercal tail, D- pectoral fin,E- Pelvic fin, F-lateral line, G-gills**
- 3) A-1st dorsal fin, B-2nd dorsal fin, C- pectoral fin, D- Pelvic fin, E- Heterocercal tail, F-lateral line, G-gills**
- 4) A-2nd dorsal fin, B-1st dorsal fin, C-Heterocercal tail, D-Pelvic fin,E-pectoral fin, F-lateral line, G-gills**

Q. 51. Select the wrong statement among these given below

- 1) Pila has radula and univalved shell**
- 2) A clitellum is seen in a mature earthworm**
- 3) Sepia(Cuttle fish) and Octopus (devil fish) have internal shells**
- 4) Bivalves are mostly used in commercial pearl production**

Q. 52. Match the following**Column I**

- i). Operculum**
- ii). Parapodia**
- iii). Scales**
- iv). Radula**
- v). Choanocytes**
- vi). Hairs**

Column II

- a. Mammalia**
- b. Porifera**
- c. Mollusca**
- d. Aves**
- e. Reptelia**
- f. Annelida**
- g. Osteichthyes**

- 1) i)=a, ii)=f, iii)=e, iv)=c, v)=b, vi)=g
- 2) i)=g, ii)=f, iii)=e, iv)=c, v)=b, vi)=a
- 3) i)=g, ii)=f, iii)=d, iv)=c, v)=b, vi)=a
- 4) i)=g, ii)=f, iii)=e, iv)=d, v)=c, vi)=a

EXPLANATION:

- **Operculum** - **Osteichthyes**
- **Parapodia** - **Annelida**
- **Scales** - **Reptelia**
- **Radula** - **Mollusca**
- **Choanocytes** - **Porifera**
- **Hairs** - **Mammalia**



BIOLOGY

THANK YOU