

CHAPTER - 7

DIVERSITY IN LIVING ORGANISMS

Multiple Choice Questions (MCQs)

Question 1:

Find out incorrect sentence

- (a) Protista includes unicellular eukaryotic organisms
- (b) Whittaker considered cell structure, mode and source of nutrition for classifying the organisms in five kingdoms
- (c) Both Monera and Protista may be autotrophic and heterotrophic
- (d) Monerans have well defined nucleus

Answer:

(d) Kingdom-Monera comprises of single celled prokaryotic bacteria, filamentous actinomycetes and photosynthetic blue green algae. Since, they are prokaryotic therefore they do not have membrane bound cell organelles and a well defined nucleus. The undefined nuclear region is termed as nucleoid.

The organisms of kingdom-Protista are unicellular and eukaryotic organisms such as unicellular algae, protozoans and unicellular fungi. Some of these organism have appendages, such as cilia (e.g., Paramecium) and flagella (e.g. Euglena). Some of them are autotrophic (synthesise their own food) like unicellular algae while others are heterotrophic (dependent on other for food) like protozoans. The heterotrophic members may be saprophytic (living on dead matter) or parasitic (living on other organisms).

Robert H Whittaker (1959) proposed the five kingdom classification considering cell structure, mode and source of nutrition.

The five kingdoms he proposed are

- | | |
|---------------------|---------------------|
| 1. Kingdom-Monera | 2. Kingdom-Protista |
| 3. Kingdom-Fungi | 4. Kingdom-Plantae |
| 5. Kingdom-Animalia | |

Both Monera and Protista may be either autotrophic or heterotrophic in nature.

Question 2:

Which among the following has specialised tissue for conduction of water?

- | | | | |
|--------------------|--------------------|--------------------|------------------|
| (i) Thallophyta | (ii) Bryophyta | | |
| (iii) Pteridophyta | (iv) Gymnosperms | | |
| (a) (i) and (ii) | (b) (ii) and (iii) | (c) (iii) and (iv) | (d) (i) and (iv) |

Answer:

(c) **Pteridophyta** are the oldest vascular plants and their body is differentiated into an aerial

shoot system and an underground root system. All ferns fall under this group. They are the most developed seedless plants with few exception e.g., Selaginella. **Gymnosperms** are naked seed bearing plants. All conifers like pines, fern's, cedars and red woods are gymnosperms. They are vascular plants i.e., they have xylem and phloem for their conduction.

Thallophytes have a body which is not differentiated into stem, roots and leaves. This kind of undifferentiated body is called thallus, hence the name thallophytes is given to them.

Algae and lichens are included in thallophytes.

Bryophytes are simple terrestrial plants and are also known as amphibians of plant kingdom. They do not have proper roots and leaves. Mosses, liverworts and hornworts are three groups of bryophytes. Both thallophytes and bryophytes are non-vascular plants i.e., they do not have xylem and phloem.

Question 3:

Which among the following produce seeds?

- (a) Thallophyta (b) Bryophyta (c) Pteridophyta (d) Gymnosperms

Answer:

(d) The reproductive organs in the members of Cryptogams (seedless plants), i.e., thallophyta, bryophyta and pteridophyta are inconspicuous or hidden. They produce naked embryos after fertilisation (union of male gamete with female gamete) that are called spores. In the case of phanerogams (seed bearing plants), i.e., the gymnosperms and angiosperms, seeds are produced after fertilisation. They contain embryo along with stored food. The stored food provides nourishment to the developing embryo. Gymnosperms bear naked seeds while the angiosperm bears seeds enclosed in a fruit (the ovules are inside the ovary).

Question 4:

Which one is a true fish?

- (a) jellyfish (b) Starfish (c) Dogfish (d) Silverfish

Answer:

(c) Jellyfish or jellies are approximately cylindrical vase shaped individuals of phylum-Cnidaria. These are free swimming marine animals consisting of a gelatinous umbrella shaped bell (pulsate for locomotion) and tentacles (to capture prey). Starfish are star shaped echinoderms. These are marine invertebrates which have a central disc and five arms, (tube feet for locomotion)

Scoliodon (dog fish) belongs to the class-Chondrichythes, i.e., pisces. These fishes are known as dog fish due to their, ability to smell. Lepismasacharina commonly known as silver fish is small wingless insect belongs to phylum-Arthropoda.

Question 5:

Which among the following is exclusively marine?

- (a) Porifera (b) Echinodermata (c) Mollusca (d) Pisces

Answer:

(b) Echinodermat on the other hand are spiny skinned marine animals.

Porifera consist of sponges which are aquatic animals which remain fixed to the bottom of the sea. Most sponges are marine but few fresh water forms are also seen like Spongilla.

Mollusca are soft bodied unsegmented animals.

Molluscs are marine as well as terrestrial forms. Pisces are found in both marine water, (e.g., dog fish) and freshwater (e.g., Rohu).

Question 6:

Which among the following have open circulatory system?

- (i) Arthropoda (ii) Mollusca
(iii) Annelida (iv) Coelenterata
(a) (i) and (ii) (b) (iii) and (iv) (c) (i) and (iii) (d) (ii) and (iv)

Answer:

(a) Blood vascular system is of two types open system and closed system

Open System	Closed System
Low pressure system	High pressure system
Blood is conveyed directly to organs without formation of capillaries	Blood is conveyed directly to the organs through capillaries.
Distribution of blood is not well regulated	Distribution of blood is well regulated and controlled
Found in leeches, most arthropods and molluscs.	Found in annelidas a except leeches cephalopods and vertebrates.

Question 7:

In which group of animals, coelom is filled with blood?

- (a) Arthropoda (b) Annelida (c) Nematoda (d) Echinodermata

Answer:

(a) The true coelom is a body cavity which arises as a cavity in embryonic mesoderm. In arthropods, annelids and Mollusca, it develops by splitting up of mesoderm. It is called schizocoelom. But in the cavity of Arthropoda and non-cephalopoda molluscs a colourless blood is present and is called haemocoel.

In echinoderms and chordates, the mesoderm arises from the wall of embryonic gut or enteron as hollow outgrowths or enterocoelomic pouches.

In coelentrates body cavity is absent. In round worms the body cavity is not lined by mesoderm, instead the mesoderm is present as scattered pouches. Such body cavity is called pseudocoelom.

Question 8:

Elephantiasis is caused by

- (a) Wuchereria (b) Pinworm (c) Planarians (d) Liver flukes

Answer:

(a) Wuchereria is a human parasite. It causes elephanties and is spread by mosquito (vector) Pinworm belongs to the phylum-Nematoda. It is also known as threadworm or seatworm. It is a common intestinal parasite and causes enterobiasis.

A planarian is one of many non-parasitic flatworms. Liver flukes are flat worms that cause liver rot.

Question 9:

Which one is the most striking or (common) character of the vertebrates?

- (a) Presence of notochord (b) Presence of triploblastic condition
(c) Presence of gill pouches (d) Presence of coelom

Answer:

(a) Vertebrates are the most advanced group of animals and is also known as craniate.

The characteristic features of vertebrate is presence of notochord. It is a long rod-like support structure that runs along back of the animal separating the nervous tissue from gut.

The other feature of vertebrate are

They have a true vertebral column and internal skeleton which allows completely different distribution of muscle attachment points that help in movement.

Their body is bilaterally symmetrical, triploblastic, coelomic and segmented.

In these animals, complex differentiation of body tissues and organs is present. They are grouped in five classes

1. Pisces
2. Amphibia
3. Reptilia
4. Aves
5. Mammalia

Question 10:

Which among the following have scales?

- (i) Amphibians (ii) Pisces
(iii) Reptiles (iv) Mammals
(a) (i) and (iii) (b) (iii) and (iv) (c) (ii) and (iii) (d) (i) and (ii)

Answer:

(c) Fish, along with reptiles, have hard protective scales on their skin for protection. The outer body of many fish is covered with scales, which are part of the fish's integumentary system. The scales originate from the mesoderm (skin).

One major characteristic of reptiles is the presence of scales composed of a protein called keratin. These scales form a waterproof barrier of skin, which allows reptiles to exist away from water without the threat of dehydration.

Amphibians use their skin as secondary respiratory surfaces. Their skin is permeable to water and gases and is lined by mucous.

Question 11:

Find out the false statement

- (a) Aves are warm blooded, egg laying and have four chambered heart
(b) Aves have feather covered body, fore limbs are modified as wing and breathe through lungs
(c) Most of the mammals are viviparous
(d) *Fishes, amphibians and reptiles are oviparous*

Answer:

(a) The characteristics possessed by aves are as follows

These are warm-blooded animals having four-chambered heart. Their body is divisible into head, neck, trunk and tail. These are flying animals, having exoskeleton of feathers. They have modified forelimbs into wings and jaws are modified into horny toothless beak.

Their bones are light in weight because of air spaces (pneumatic bones) and the body is streamlined to reduce air resistance during flight.

Lungs as well as air sacs are present for double respiration.

Oviparous Animals	Viviparous Animals
Females lay fertilised/unfertilised eggs.	Females give birth to young ones.
The development of zygote takes place outside the female's body.	The development of zygote takes place inside the female's body.
Females lay number of eggs in a safe place in the environment but the chances of survival are less.	Females deliver few young ones and the chances of survival are more.
Examples All birds, most of reptiles and egg-laying mammals.	Examples Mammals except egg-laying mammals.

Question 12:

Pteridophyta do not have

- (a) root (b) stem (c) flowers (d) leaves

Answer:

(c) Pteridophytes are the oldest vascular plants. Their bodies are differentiated into an aerial shoot system and an underground root system. The reproductive organs are multicellular. The pollen produced by these plants are carried by the wind and an embryo develops after fertilisation. These plants do not produce seeds, or are seedless plants and have no flowers.

Question 13:

Identify a member of Porifera

- (a) Spongilla (b) Euglena (c) Penicillium (d) Hydra

Answer:

(a) Spongilla belongs to the phylum-Porifera members of which passers preous body and are fixed to substrate with havitats. Euglena is a protist, Penicillium belongs to kingdom Fungi and Hydra is a coelentrate.

Question 14:

Which is not an aquatic animal?

- (a) Hydra (b) Jelly fish (c) Corals (d) Filaria

Answer:

(d) Filaria is a disease caused by Wuchereria bancrofti, it is not an aquatic animal, whereas, Hydra is a coelentrate and is a freshwater organism. Jelly fish is a marine animal. Corals are cnidarians and marine invertebrates.

Question 15:

Amphibians do not have the following

- (a) Three chambered heart
(b) Gills or lungs
(c) Scales
(d) Mucous glands

Answer:

(c) Amphibians do not have scales, instead their skin has mucous secreting glands. (Also, refer to Q. 10)

Question 16:

Organisms without nucleus and cell organelles belong to

- (i) fungi (ii) protista
(iii) cyanobacteria (iv) archaebacteria
(a) (i) and (ii) (b) (iii) and (iv) (c) (i) and (iv) (d) (ii) and (iii)

Answer:

(b) Cyanobacteria and archaebacteria belong to kingdom-Monera. Monerans are organisms without nucleus and cell organelles and are called prokaryotes. (Also, refer to Q. 1)

Question 17:

Which of the following is not a criterian for classification of living organisms?

- (a) Body design of the organism
(b) Ability to produce one's own food
(c) Membrane bound nucleus and cell organelles
(d) Height of the plant

Answer:

(d) Classification deals with the arrangement of organisms or groups of organisms into categories. The living form vary in shape, size, structure and function etc. The variation in their appearance, body design and behaviours form basis of classification.

Other characters are

- (i) Whether the organism is prokaryotic or eukaryotic.
- (ii) Mode of nutrition (animals).
- (iii) Levels of organisation (animals).
- (iv) Presence/Absence of vascular tissue (plants).
- (v) Seed bearing/not bearing (plant).
- (vi) Naked seed or covered seed (plants).
- (vii) Symmetry (animals).

Question 18:

The feature that is not a characteristic of protochordata?

- (a) Presence of notochord
- (b) Bilateral symmetry and coelom
- (c) Jointed legs
- (d) Presence of circulatory system

Answer:

(c) Jointed legs are characteristics of arthropods so it is not a character of protochordates

The feature of protochordates are

They are triploblastic bilaterally symmetrical body and a coelom.

They show **notochord** (a new feature of body design) at some stages of their lives. These are mostly marine animals, e.g., Balanoglossus, Herdmania, Amphioxus or Branchiostoma and Doliolum.

Question 19:

The locomotory organs of Echinodermata are

- (a) tube feet
- (b) muscular feet
- (c) jointed legs
- (d) parapodia

Answer:

(a) Tube feet are locomotory organs of echinoderms they are spiny-skinned marine animals. They have an exoskeleton of calcareous plates from which the spines arise. The adults are radially symmetrical, while the larvae are bilaterally symmetrical. Most echinoderms are sessile as they live in groups, while others are solitary.

A unique feature of echinoderms is the water vascular system. It is a complex system of water-containing tubes and bladders which pass through pores in the skeleton. On the outside, these tubes look like feet. These tube feet are used for locomotion, exchange of gases and feeding. In most echinoderms the mouth is on the lower surface and the anus is on the upper surface.

Echinoderms reproduce sexually and the sexes are separate. Some echinoderms like starfish (Asterias) and brittle stars (e.g., Ophiura) have arms arising from a central disc.

While other sea urchins (Echinus), heart urchins (Echinocardium) and sea cucumbers (Holothuria) do not have arms. Sea cucumbers have tentacles near the mouth.

Question 20:

Corals are

- (a) poriferans attached to some solid support
- (b) cnidarians, that are solitary living
- (c) poriferans present at the sea bed
- (d) cnidarians that live in colonies

Answer:

(d) Corals are marine invertebrates of phylum-Cnidaria. They live in compact colonies of many identical individual 'polyps'. The group includes the important reef builders that inhabit tropical oceans and secrete calcium carbonate to form a hard skeleton. Although some

corals can catch small fish and plankton, using stinging cells on their tentacles, like those in sea anemone and jellyfish but most corals obtain the majority of their energy and nutrients from photosynthetic unicellular algae that live within their tissue.

Question 21:

Who introduced the system of scientific nomenclature of organisms

- (a) Robert Whittaker (b) Carolus Linnaeus
(c) Robert Hooke (d) Ernst Haeckel

Answer:

(b) Carolus Linnaeus (a Swedish botanist) is considered the father of Taxonomy. He formulated the method of naming organisms called **the binomial system of nomenclature**.

In this system, each type of organism has two Latin names i.e., one for its genus and the other for its species, e.g., all frogs have the genus name Rana and the Indian bull frog has the species name tigrina, so the Indian bull frog is called Rana tigrina.

Linnaeus also introduced a sequence of groups of organisms, or a way of classifying them. All organisms were divided into kingdoms. The kingdoms were divided into phyla (singular: phylum), the phyla into classes and the classes into **orders**. Then came family, followed by genus and species. Individuals of a species bear the closest resemblance to each other. Organism → Super kingdoms → Kingdoms → Phyla → Classes → Orders → Families
Genera → Species.

Question 22:

Two chambered heart occurs in

- (a) crocodiles (b) fish (c) aves (d) amphibians

Answer:

(b) Crocodiles have four chambered heart. Aves and amphibians have three chambered heart. Two chambered heart occurs in fishes.

Question 23:

Skeleton is made entirely of cartilage in

- (a) sharks (b) tuna (c) rohu (d) None of these

Answer:

(a) Cartilaginous fishes have endoskeleton made up of cartilage, e.g., Scoliodon (dog fish) shark Torpedo, sting ray etc.

Question 24:

One of the following is not an Annelida

- (a) Nereis (b) Earthworm (c) Leech (d) Sea urchins

Answer:

(d) Sea urchins is not an annelids. They called as sea hedgehogs are small spiny globular animals of phylum-Echinodermata. They are found in almost all the oceans. Common – colours include black, dull shades of green, olive, brown, purple, blue and red. Annelids are triploblastic animals having bilaterally symmetrical body. They bear metameric segmentation and are the first coelomates. e.g., Nereis, earthworm and leech.

Question 25:

The book systema naturae was written by

- (a) Linnaeus (b) Haeckel (c) Whittaker (d) Robert Brown

Answer:

(a) **Systema Naturae** is work of Swedish botanist, zoologist and physician Carolus Linnaeus. He described his binomial system of classification in this book.
(Also, refer to Q. 21)

Ernst Haeckel was a German biologist who gave three kingdom classification (1866).

Kingdom-Plantae

Kingdom-Protista

Kingdom-Animalia

Whittaker gave the five kingdom classification (Also, refer to Q. 1)

Question 26:

Carl von Linna was involved with which branch of science?

- (a) Morphology (b) Taxonomy (c) Physiology (d) Medicine

Answer:

(b) Carl von Linnaeus is known as Father of Taxonomy.

(Also, refer to Q. 21)

Question 27:

Real organs are absent in

- (a) Mollusca (b) Coelenterata (c) Arthropoda (d) Echinodermata

Answer:

(b) Coelenterates are multicellular, diploblastic and acoelomate animals having tissue level of organisation i.e., they lack true organs. Mollusca, Arthropoda and Echinodermata have organ level of organisation.

Question 28:

Hard calcium carbonate structures are used as skeleton by

- (a) Echinodermata (b) Protochordata (c) Arthropoda (d) Nematoda

Answer:

(a) Body wall of echinodermata is covered with spiny, hard, calcareous (calcium carbonate) plates (ossicles) that form a rigid or flexible endoskeleton.

(Also, refer to Q. 19).

Question 29:

Differentiation in segmental fashion occurs in

- (a) Leech (b) Starfish (c) Snails (d) Asca/7s

Answer:

(a) Leech (annelids) have metameric segmentation i.e., their body is divided into segments which are identical to each other and bear set of organs in each segment.

Question 30:

In taxonomic hierarchy family comes between

- (a) Class and Order (b) Order and Genus
(c) Genus and Species (d) Division and Class

Answer:

(b) The taxonomic hierarchy is

Species It is the lowest taxonomic category, e.g., *Pisum sativum* (pea)

Genus Consists of closely related species and is ranked higher than species, e.g., dog and wolf are kept in the same genus *Canis*'s.

Family Group of related genera having several common characters form a family, e.g., cat and lion belong to same family-Felidae.

Order Assemblage of a number of families having common characters is an order. Class Organisms of related order or orders having similarity are placed together in a class, e.g., rats, camels and monkeys are all included in same class-Chordata.

Phylum The classes having same specific characters which are common to all of them are placed under same phylum, e.g., Phylum-Angiospermae.

Kingdom Highest category of taxonomic studies, consisting of set of distinguishing common

characters. The organisms having same fundamental characteristics are grouped together, e.g., Kingdom-Plantae and Animalia.

Question 31:

Five kingdom classification has given by

- (a) Morgan (b) R H Whittaker (c) Linnaeus (d) Haeckel

Answer:

(b) Five kingdom classification was given by R H Whittaker.

(Also, refer to Q. 1,21 and 25)

Question 32:

Well defined nucleus is absent in

- (a) blue-green algae (b) diatoms (c) algae (d) yeast

Answer:

(a) Blue-green algae or cyanobacteria is a prokaryotic organism, i.e., it lacks well defined nucleus, whereas diatoms, algae and yeast all are eukaryotic organism, i.e., they show the presence of true nucleus and cell membrane bound organelles.

Question 33:

The 'Origin of Species' is written by

- (a) Linnaeus (b) Darwin (c) Haeckel (d) Whittaker

Answer:

(b) Charles Darwin, an English naturalist, first described the idea of evolution in his book 'The Origin of Species', published in 1859. According to him, most of the life forms present today have developed by an accumulation of changes in body design over a period of time through natural selection and are more complex than their ancestral forms.

Question 34:

Meena and Hari observed an animal in their garden, Hari called it an insect while Meena said it was an earthworm. Choose the character from the following which confirms that it is an insect.

- (a) Bilateral symmetrical body (b) Body with jointed legs
(c) Cylindrical body (d) Body with little segmentation

Answer:

(b) The most striking feature of arthropods i.e., insects is the presence of jointed appendages or presence of jointed legs.

Short Answer Type Questions

Question 35:

Write true (T) or false (F).

- (a) Whittaker proposed five kingdom classification.
(b) Monera is divided into archaeobacteria and eubacteria.
(c) Starting from class species comes before the genus.
(d) Anabaena belongs to the kingdom-Monera.
(e) Blue green algae belongs to the kingdom-Protista.
(f) All prokaryotes are classified under Monera.

Answer:

- (a) True (b) True

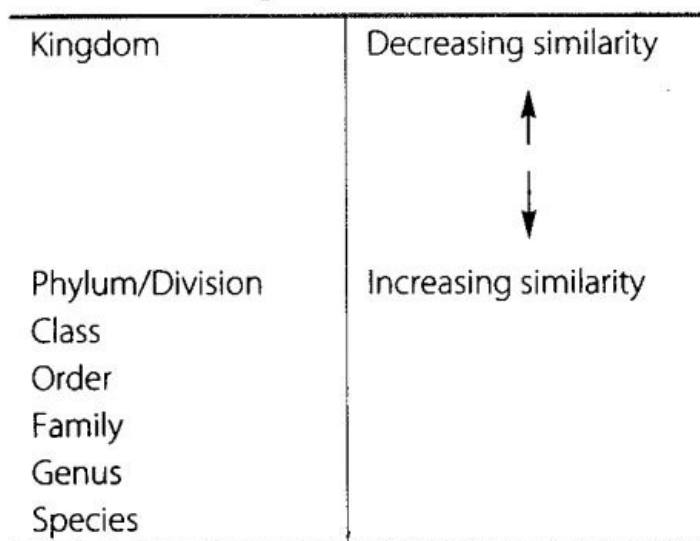
Five kingdom classification was given by Whittaker.

The kingdom-Monera is divided into two sub-kingdoms Archaeobacteria (archaea) Eubacteria (bacteria).

(c) False

Linnaeus's scheme of arranging organisms into an ascending series of groups of ever increasing inclusiveness forms the hierarchical system of classification.

The hierarchy of taxonomic categories or taxa is



(d) True

Anabaena is a genus of filamentous cyanobacteria of kingdom-Monera. It exists as plankton and is known for its nitrogen fixing abilities.

(e) False ,

Blue-green algae or cyanobacteria is a phylum of kingdom bacteria that obtain their energy through photosynthesis. They can be found in almost every terrestrial and aquatic habitat. They can occur as planktonic cells or form phototrophic biofilms.

(f) True

Five kingdom system given by Whittaker given the concept that all the prokaryotic including bacteria and blue green algae belongs to kingdom-Monera.

Question 36:

Fill in the blanks.

- Fungi shows..... mode of nutrition.
- Cell wall of fungi is made up of.....
- Association between blue green algae and fungi is called as.....
- Chemical nature of chitin is.....
- has smallest number of organisms with maximum number of similar characters.
- Plants without well differentiated stem, root and leaf are kept in
- are called as amphibians of the plant kingdom.

Answer:

(a) **Saprotrophic** Fungi are multicellular organisms whose mode of nutrition is saprotrophic, or saprobic. They absorb nutrients from dead plant and animal matter, excreta, etc. By releasing digestive enzymes in them.

Some fungi are parasitic and cause diseases. Ringworm is a skin infection caused by a fungus, while smut is a fungal crop disease. Some fungi, are mutualistic or symbiotic. They absorb nutrients from their partners and help them too, e.g., certain fungi associated with algae, (lichens).

(b) **Chitin** Fungi are achlorophyllous, heterotrophic and eukaryotic organisms. Their cell wall is made up of rough, complex sugar called chitin, or fungal cellulose.

(c) **Lichens** Some fungal species live in permanent mutually dependent relationships with blue-green algae (or cyanobacteria). Such relationships are called symbiotic and these symbiotic life forms include lichens.

- (d) **Carbohydrate** Chitin is a modified polysaccharide that contains nitrogen. Chitin may be described as cellulose with one hydroxyl group on each monomer, chemically known as N-acetyl glucose mine.
- (e) **Species** A species is one of the basic units of biological classification and a taxonomic rank. It includes minimum number of organisms with maximum number of similar characters.
- (f) **Thallophyta** Plants without well differentiated stem, root and leaf are kept in Thallophyta.
- (Also, refer to Q. 2)
- (g) **Bryophytes** Bryophytes are called amphibians of plant kingdom as they can survive on both land and water.

Question 37:

You are provided with the seeds of gram, wheat, rice, pumpkin, maize and pea. Classify them whether they are monocot or dicot.

Answer:

On the basis of number of cotyledons, the angiosperms are divided into

(a) Dicotyledonae (Dicots)

- (i) The seeds produced by these plants have embryos with two fleshy
- (ii) Their leaves have reticulate venation, with a network of veins and veinlets.
- (iii) The root system has a prominent tap root.
- (iv) The flowers have five or multiple of five petals.
- (v) The vascular bundles are arranged in a ring. They are open (i.e., have cambium) between xylem and phloem and undergo secondary growth.

(b) Monocotyledonae (Monocots) ,

- (i) The seeds of these plants have only one cotyledon.
- (ii) Their leaves have parallel venation.
- (iii) The root system consists of similar fibrous roots.
- (iv) The flowers have three or multiple of three petals.
- (v) The vascular bundles are scattered and closed, (i.e., lack cambium). Secondary growth does not occur.

Out of the given example seeds of maize, wheat and rice are monocots.

Question 38:

Match items of column I with items of column II.

Column I	Column II
A. Naked seed	1. Angiosperms
B. Covered seed	2. Gymnosperms
C. Flagella	3. Bryophytes
D. <i>Marchantia</i>	4. <i>Euglena</i>
E. <i>Marsilea</i>	5. Thallophyta
F. <i>Cladophora</i>	6. Pteridophyta
G. <i>Penicillium</i>	7. Fungi

Answer:

The correct matching is

Column I	Column II
A. Naked seed	Gymnosperms
B. Covered seed	Angiosperms
C. Flagella	<i>Euglena</i>
D. <i>Marchantia</i>	Bryophyta
E. <i>Marsilea</i>	Pteridophyta
F. <i>Cladophora</i>	Thallophyta
G. <i>Penicillium</i>	Fungi

Gymnosperms (gym/io-naked; sperma-seed) bear most primitive seeds which are naked and not enclosed within a fruit.

Angiosperms (angio-covered; sperma-seed) bear seeds which develop inside the embryo which modifies to become fruit.

Euglena is a genus of unicellular flagellate, protists. Species of *Euglena* are found in fresh and salt water.

Pteridophyta are first land plants, having vascular tissues for e.g. fern (*Marselia*, *Azolla*, *Pteris* etc). Bryophyta are called amphibians of plant kingdom because they live on both land as well as water, e.g., *Marchantia* (livers worts).

Thallophyta (or thallus like organisation) do not have well differentiated body design. e.g., *Cladophora*.

Question 39:

Match items of Column I with items of Column II.

Column I	Column II
A. Pore bearing animals	1. Arthropoda
B. Diploblastic	2. Coelenterata
C. Metameric segmentation	3. Porifera
D. Jointed legs	4. Echinodermata
E. Soft bodied animals	5. Mollusca
F. Spiny skinned animals	6. Annelida

Answer:

The correct matching is

Column I	Column I
A. Pore bearing animals	Porifera
B. Diploblastic	Coelenterata
C. Metameric segmentation	Annelida
D. Jointed Legs.	Arthropoda
E. Soft bodied	Mollusca
F. Spiny skinned animals	Echinodermata

Porifera are multicellular animals with a cavity called spongocoel. They bear pores throughout their body surface, e.g., *Spongilla*.

Coelentrates are multicellular, diploblastic and acoelomate animals having tissue level organisation, e.g., *Hydra*.

Mollusca are soft bodied animals and have bilateral symmetry, little segmentation is present without appendages.

Question 40:

Classify the following organisms based on the absence/presence of true coelom, (i.e., acoelomate, pseudocoelomate and coelomate)

<i>Spongilla</i>	Sea anemone	Planaria	Liver fluke
<i>Waucheria</i>	<i>Ascaris</i>	<i>Nereis</i>	Earthworm
Scorpion	Birds	Fishes,	Horse

Answer:

Coelom is the main body cavity in most multicellular animals and it contains digestive tract and other organs. Organisms in which coelom is absent are *Spongilla*, sea anemone, *Planaria* and liverfluke, hence are, called acoelomates.

Pseudocoelomates are animals without true coelom e.g., *Waucheria bancrofti*.

Animals in which coelom is present are, *Ascaris* (Aschelminthes), *Nereis* (Annelida), earthworm (Annelida), scorpion (Arthropoda), birds (Aves), fishes (Pisces) and horse (Mammalia).

Question 41:

Endoskeleton of fishes are made up of cartilage and bone, classify the following fishes as cartilaginous or bony

Torpedo, Sting ray, Dog fish,
Rohu, Angler fish, *Exocoetus*.

Answer:

Bony fishes	Cartilaginous fishes
1. Endoskeleton is bony	Endoskeleton is cartilaginous
2. Four pairs of gill slits are present which are covered by an operculum.	5-7 pairs of gill slits are present and an operculum is absent.
3. Mouth is terminal in position.	Mouth is ventral in position.
4. Caudal fin is homocercal.	Caudal fin is heterocercal.
5. Air or swim bladder is usually present.	Air or swim bladder is absent.
6. Marine and freshwater	Exclusively marine fishes
7. Mostly oviparous. e.g., <i>Labeo rohita</i> (rohu), Angler fish, fish, <i>exocoetus</i>	Most of them are viviparous e.g., <i>Scoliodon</i> (dog, fish), <i>Torpedo</i> , sting ray.)

Question 42:

Classify the following based on number of chambers in their heart rohu, *scoliodon*, frog, salamander, flying lizard, king, cobra, crocodile, ostrich, pigeon, bat, whale.

Answer:

Pisces (fishes) have only two chambered hearts, e.g., Rohu, *Scoliodon*.

Amphibians have three chambered hearts except crocodiles, e.g., frog, salamander. Reptiles also have three chambered heart, e.g., flying lizard, king cobra.

Crocodiles have four chambered heart (an exception is reptiles).

Aves warm blooded animals having four chambered heart, e.g., ostrich, pigeon, bat, whale, etc

Question 43:

Classify Rohu, Scoliodon, flying lizard, king cobra, frog, salamander, ostrich, pigeon, bat, crocodile and whale into the cold blooded/warm blooded animals.

Answer:

Cold blooded creatures take on the temperature of their surroundings. They are hot when their environment is hot and cold when their environment is cold. In hot environments, cold-blooded animals can have blood that is much warmer than warm-blooded animals.

Cold-blooded animals are much more active in warm environments and are very sluggish in cold environments. This is because their muscle activity depends on chemical reactions which run quickly when it is hot and slowly when it is cold.

A cold-blooded animal can convert much more of its food into body mass compared with a warm-blooded animal. e.g., Rohu, flying lizard.

Warm blooded Warm-blooded creatures, like mammals and birds, try to keep their bodies at a constant temperature. They do this by generating their own heat when they are in a cooler environment, and by cooling themselves when they are in a hotter environment. To generate heat, warm-blooded animals convert the food that they eat into energy. They have to eat a lot of food, compared with cold-blooded animals, to maintain a constant body temperature. Only a small amount of the food that a warm-blood animal eats is converted into body mass. The rest is used to fuel a constant body temperature, e.g., Scoliodon, ostrich, pigeon, bat and whale.

Question 44:

Name two egg laying mammals.

Answer:

Monotremes are the **mammals** that lay eggs (Prototheria) instead of giving birth to young over like **marsupials** (Metatheria) and placental mammals (Eutheria). The only surviving examples of monotremes are indigenous to **Australia** and New Guinea. The existing monotreme species are the **Platypus** and four species of echidnas (or spiny ant eaters).

Question 45:

Fill in the blanks

- (a) Five kingdom classification of living organisms is given by.....
- (b) Basic smallest unit of classification is.....
- (c) Prokaryotes are grouped in kingdom.....
- (d) Paramecium is a Protista because of its.....
- (e) Fungi do not contain.....
- (f) A fungus..... can be seen without microscope.
- (g) Common fungi used in preparing the bread is.....
- (h) Algae and fungi form symbiotic association called.....

- | | | | |
|-----------------|--------------|------------|-----------------|
| (a) Whittaker | (b) Species | (c) Monera | (d) Single cell |
| (e) Chlorophyll | (f) Mycelium | (g) Moulds | (h) Lichen |

Answer:

Five kingdom classification of living organism was proposed by **Whittaker** (1959).

Linnaeus proposed the hierarchial system of classification which states that species are the smallest unit of classification.

The first kingdom classification given by **Whittaker** is kingdom-Monera which includes prokaryotic cells (e.g., bacteria) and blue-green algae.) second kingdom in classification is Protista which are unicellular eukaryotic organisms including protozoans (Paramecium) and algae. Third kingdom is fungi which are multicellular organisms.

Fungi are multinucleate, do not possess chlorophyll and depends on others for their food (/'.e.,heterotrophs). Fungi form a network of hyphae which are called as mycellium. These helps in the absorption of mineral from the substrate.

There are multicellular and can be seen without microscope. Yeast are the fungi grouped as moulds helps in the preparations of bread. There are unicellular fungi. Lichens shows symbiotic association (mutual relationship) between algal and fungi which co-exist for mutual benefit.

Question 46:

Give True (T) and False (F)

- (a) Gymnosperms differ from angiosperms in having covered seed.
- (b) Non-flowering plants are called cryptogamae.
- (c) Bryophytes have conducting tissue.
- (d) Funaria is a moss.
- (e) Compound leaves are found in many ferns.
- (f) Seeds contain embryo.

Answer:

- (a) True (b) True (c) False (d) True (e) True (f) True

Question 47:

Give examples for the following

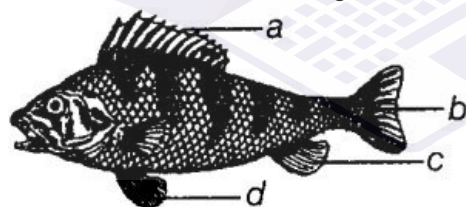
- (a) Bilateral, dorsiventral symmetry is found in.....
- (b) Worms causing disease elephantiasis is.....
- (c) Open circulatory system is found in where coelomic cavity is filled with blood (hemolymph).
- (d) are known to have pseudocoelom.

Answer:

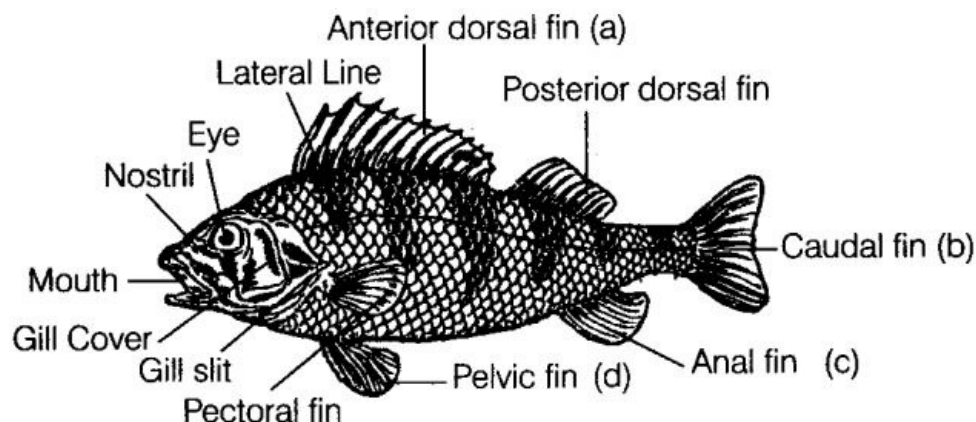
- (a) Platyhelminthes (b) *Wuchereria bancrofti*
(c) Arthropods (d) Annelids

Question 48:

Label a, b, c and d. Given in figure. Give the function of (b)

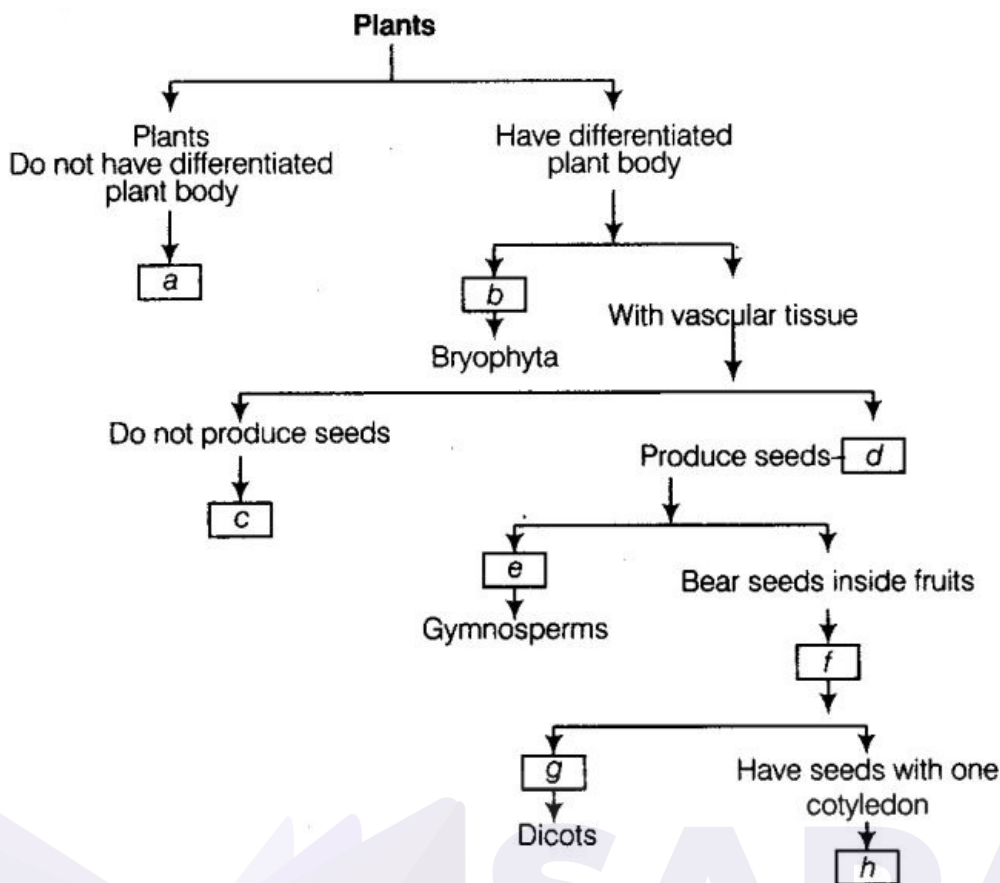


Answer:



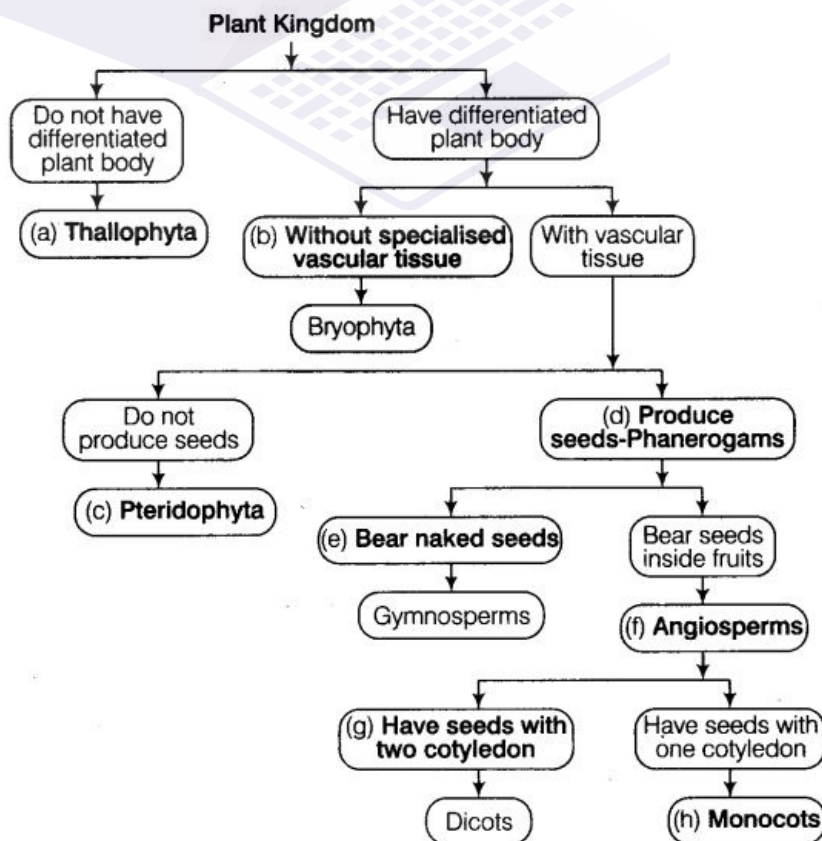
Question 49:

Fill in the boxes given in figure with appropriate characteristics/plant group (s).



Answer:

- (a) Thallophytes
 (b) Without vascular tissue
 (c) Pteridophyta
 (d) Phanerogams
 (e) Bear naked seeds
 (f) Angiosperms
 (g) Have seed with two cotyledons.
 (h) Monocots.



Long Answer Type Questions

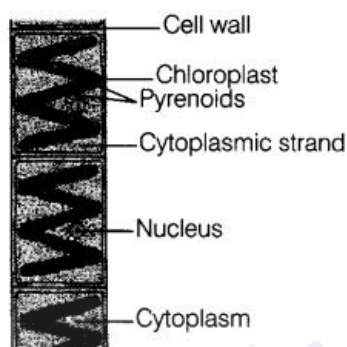
Question 50:

Write names of few thallophytes. Draw a well labelled diagram of Spirogyra.

Answer:

Few examples of thallophytes are

- Spirogyra
- Ulva
- Chara
- Polysiphonia
- Ulothrix
- Cladophora
- Laminaria



A well labelled diagram of *Spirogyra*

Question 51:

Thallophyta, bryophyta and pteridophyta are called as 'cryptogams', gymnosperms and angiosperms are called as 'phanerogams'. Discuss why? Draw one example of gymnosperm.

Answer:

Cryptogams are seedless plants. The reproductive organs of members of cryptogams are inconspicuous or hidden. They produce naked embryos after fertilisation that are called spores.



Cycas
(A gymnosperm)

Cryptogams are further divided into thallophytes (undifferentiated body), Bryophyta (moss plant) and pteridophytes (vascular cryptogams).

Plants which make seeds and have well-differentiated reproductive tissues are called **phanerogams**. In these plants seeds consists of embryo along with stored food. The stored food serves the purpose of initial growth of the embryo during germination.

On the basis of presence or absence of naked seeds, these are divided into two groups

- (i) gymnosperms (naked seed) (ii) angiosperms (covered seed).

Question 52:

Define the terms and give one example of each

- (a) Bilateral symmetry
- (b) Coelom
- (c) Triploblastic

Answer:

- (a) The animals with bilateral symmetry are put in group bilateria. The body can be divided into two identical right and left halves in only one plane, e.g., platyhelminthes, annelids, arthropods, etc.
- (b) Coelom is the body cavity present between the body wall and the gut wall. Presence or absence of coelom is very important basis of classification.
- (i) **Acoelomate** Coelom is absent, e.g., poriferous, coelentrates, ctenophores and flatworms.
- (ii) **Pseudocoelomate** The body cavity is not lined by mesoderm instead it is present as scattered pouches in between mesoderm and endoderm. e.g., round worms.
- (iii) **Eucoelomate** Presence of true coelom. True coelom is of two types
- **Schizocoelom** Develops by splitting up of mesoderm.
 - **Enterocoelom** The mesoderm arises from wall of embryonic gut.

(c) Germ layers gives rise to all the tissues/organs of the fully formed individuals. On the basis of number of germ layers animals can be

- (i) **Diploblastic** The body cells are arranged in two layers on outer ectoderm and on inner endoderm, e. g., Coelentrates.
- (ii) **Triploblastic** Body wall of animals is made up of three germ layers e., ectoderm, mesoderm and endoderm e.g., Platyhelminthes to chordates.

Question 53:

You are given leech, Nereis, Scolopendra, prawn and scorpion; and all • have segmented body organisation. Will you classify them in one group? If no, give the important characters based on which you will separate these organisms into different groups.

Answer:

The organisms here do not belong to the same group. Leech and Nereis belong to phylum- Annelida while, Scolopendra, prawn and scorpion belong to phylum-Arthropoda. The distinguishing factors of both the phylums are given below

Annelids (Latin, annulus-ring; lidos-form)	Arthropods (Greek, arthro-oined; podos-foot)
1. These are triploblastic animals having bilaterally symmetrical, elongated, vermiform, cylindrical or dorsoventrally flattened body.	1. These are triploblastic, bilaterally symmetrical and segmented animals.
2. Annelids are the first animals to develop true body cavity or coelom.	2. Body cavity is filled with blood, i.e., haemocoelic and have open circulatory system, so the blood does not flow in blood vessels. Excretion takes place by Malpighian tubules (insects) and green glands (crab and prawn). In many arthropods, compound eyes are present with mosaic vision.

3. The differentiation occurs in a segmental fashion, with the segments lined up one after the other from head to tail (metameric segmentation).	3. Body segments are grouped into two regions, i.e., cephalothorax (head and thorax together) and abdomen or three region, i.e., head, thorax and abdomen. Body segment of these animals (somite) usually bears paired lateral and jointed legs or appendages. Muscular system with exoskeleton for attachment is present. Gillia are absent.
4. Their sexes may be hermaphroditic or separate.	4. Fertilisation is usually internal, oviparous or ovoviviparous often with metamer sexes are usually separate.
5. Locomotion is done with the segmentally arranged paired lateral appendages, parapodia or chitinous setae or chaetae . They respire through skin.	5. Respiration is through general body surface, by gills, air tubes (tracheae) or book lungs .

Question 54:

Which organism is more complex and evolved among bacteria, mushroom and mango tree?
Give reasons.

Answer:

Mango tree is the most evolved and complex organism. It is an eukaryotic, multicellular, autotrophic terrestrial plant. It is an angiosperm (seeds are covered). Its reproductive organs are aggregated in a flower and therefore it is called a flowering plant.

Bacteria are prokaryotic unicellular organism and fungi are heterotrophic, simple thallophyte with no body differentiation. Therefore, both of these are simple organism.

Question 55:

Differentiate between flying lizard and bird. Draw the diagram.

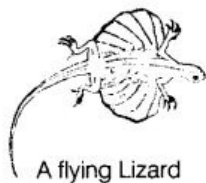
Answer:

Flying lizard is a reptile while bird belongs to class-Aves.

Class-Reptilia (L., <i>repre</i> -to crawl; creeping vertebrates)	Class Aves (L., <i>avis</i> -bird)
1. Ectothermic or cold-blooded, terrestrial or aquatic vertebrates.	1. Warm-blooded, tetrapodous vertebrates (birds) with various flight adaptations. Size ranges from smallest humming bird to largest ostrich.
2. The body covered with dry water-proof skin having horny epidermal scales or dermal scute plates.	2. Horny scales persist on the feet but feathers cover most of the body. Cutaneous glands are absent.
3. Body varies in form and is usually divided into head, neck, trunk and tail.	3. Spindle or boat-shaped body is divisible into head, neck, trunk and tail.
4. Limbs are tetrapodous pentadactyle (five-toed) type; with clawed digits (limbs are absent in snakes and some lizards).	4. Fore-limbs modified into wings for flight. Hind-limbs bear four clawed digits and are adapted for walking, perching, or swimming.
5. Teeth are present in all reptiles except in tortoises and turtles.	5. Narrow jaws form a horny beak, which is modified for different purpose. Teeth are absent.
6. Respiration is through lungs only. No gills are present.	6. They breathe through lungs.

7. Heart is three chambered and is divided into two auricles and an incompletely divided ventricle. Only crocodiles have four-chambered heart.
8. Fertilisation is internal. Most reptiles are oviparous and lay their eggs with tough covering and do not need to lay their eggs in water. A few reptiles are viviparous, (e.g., lizards and snakes). No aquatic larval stage.

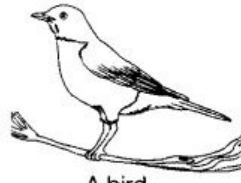
9.



A flying Lizard

7. Four-chambered heart with two auricles and two ventricles.
8. Fertilization is internal. They are oviparous and lay large, yolk-laden eggs having hard shell.

9.



A bird

Question 56:

List out some common features in cat, rat and bat.

Answer:

Cat, bat and rat belong to the class-Mammalia and have following common features

- (i) All have notochord at some stage of their lifecycle.
- (ii) All are warm-blooded
- (iii) All have four-chambered heart.
- (iv) All have skin covered with hair and have sweat and oil glands.
- (v) Body is divisible into head, neck, trunk and tail.
- (vi) Females have milk producing mammary glands.
- (vii) Fleshy external ear (pinna) is present.
- (viii) Respiration is through lungs only.
- (ix) Excrete urea (ureotelic animals)
- (x) Fertilisation is internal.

Question 57:

Why do we keep both snake and turtle in the same class?

Answer:

Snake and turtle belong to same class-Reptilia. They are kept in same class because both

- (i) are cold-blooded.
- (ii) have scales as outer covering.
- (iii) have lungs for breathing.
- (iv) have three-chambered heart.
- (v) lay eggs with tough outer covering.
- (vi) Fertilisation is internal.