Diversity in Living Organisms

What is the Basis of Classification

Q.1 What is taxonomy? Who is known as the father of taxonomy? Define taxon.

i) Taxonomy is a science of **naming and arranging organisms** into a classification system in order to examine their origin and history.

ii) **Carl Linnaeus** is known as father of taxonomy.

iii) **Taxon** is defined as a taxonomic group or category such as phylum, order, family or genus that are used while classifying living organisms.

Q.2 What is meant by classification?

Classification means identifying the similarities and dissimilarities between different kinds of organisms and placing the organisms with similar characteristics in one group and different organisms in different groups.

Q.3 Why do we classify organisms?

Classification makes the study of organisms much easier as there are millions of life forms and we cannot study them one by one. We can study the different classes or groups much easily after classifying them.

Q.4 Give three examples of range variations that you see in life forms around you.

(a) ***Range of size***: Microscopic bacteria of a few micrometre in size to blue whales and Redwood trees of California of approximate size of 30 metres and 100 metres respectively.

(b) ***Range of lifespan***: Pine trees living for thousands of years to insects like mosquitoes which die within a few days.

(c) ***Range of colour***: Life ranges from colourless worms to brightly coloured birds and flowers

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Q.5 What are the advantages in classifying organisms?

Organic evolution has been taking place for 3.5 billion years. It is impossible to study every living organism from an individual level. Therefore, classification is necessary to facilitate easy study of organisms.

1. It makes the study of wide variety of organisms easy.

2. It determines the method of organising the diversity of life on Earth.

3. It helps to understand relationships and resemblances between various organisms

4. It helps in understanding the evolution of organisms

Q.6 What is meant by characteristics?

By **characteristic**, we mean a particular form or particular function that are used to classify the diverse group of organisms into groups. For example- The five fingers on each hand of human beings is a characteristic. Similarly, the ability of human beings to run unlike plants is also a characteristic.

Q.7 On what basis did Aristotle classify organisms? Was it a correct way of classification? Why?

Aristotle classified organisms according to whether they lived on **land,** in **water** or **air** and on **physical difference**. It was not a correct way of classification because animals which live in water differ in many different ways. Same is the case with those in air and on land. Habitat is the only point they share in common

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Q.8 What is the importance of putting organisms in groups?

i) With such a vast number of organisms - both living and extinct, it becomes impossible to study every one of them at individual level.

ii) The task of studying the diversity of living organisms can be made easier and more effective if the various organisms are arranged in an orderly manner.

iii) It is also useful because it allows us to identify similarities and differences among living things.

Q.9 What is the primary characteristic on which the first division of organisms is made?

The primary characteristic on which first division of organisms is based on whether the cells occur singly (***unicellular***) or they are grouped together and function as individual group (***multicellular***). Cell is considered to be the fundamental characteristic for classifying all living organisms.

Q.10 Which do you think is a more basic characteristic for classifying organisms?

(i) The place where they live.

(ii) The kind of cells they are made of why?

Option (11).The kind of cells they are made up of is the more basic characteristic for classifying organisms. It is for the following reasons:

(i) Classifying organisms based on habitat can be misleading. In every place, different types of organisms may live. They may not have similarities except for the common habitat. For example- An elephant and rabbit both live on land but they differ from each other in a number of ways. Moreover, further sub-classification is also not possible.

(ii) Cells are the functional and structural unit of life. Primarily, we can differentiate an organism as unicellular or multicellular. Further sub-classification is also possible based on cell types, its complexity etc.

Q.11 What makes the basic distinction in the body design of organisms?

The type of cells whether **prokaryotic** or **eukaryotic** is a characteristic that makes a basic distinction in the body design of organisms.

Q.12 Give three examples of characteristics used for hierarchical classification.

The three examples of characteristics used for hierarchical classification are

(1) Prokaryotic or eukaryotic

(2) unicellular or multicellular

(3) mode of nutrition autotrophic or heterotrophic.

Q.13 On what basis are plants and animals put into different categories?

The basic design in plants and animals is different based on the need to make their own food (in plants) or acquire it (in animals).

- Plants are ***autotrophic*** means they can make their own food, whereas animals cannot.
- ***Locomotio***n is another characteristic which separates animal and plants in the classification.
- Their ***body designs*** are also different based on this characteristic.

So, they are put into different categories.

Classification and Evolution

Q.14 What is evolution?

Evolution is the **gradual unfolding** of organisms from the pre-existing ones through changes since the beginning of life.

Q.15 Which organisms are called primitive and how are they different from the so-called advanced organisms?

Groups of organisms which have **ancient body designs** that have **not changed** very much is called primitive or lower organisms. On the other hand, an organism **acquired their particular body designs recently** is called advanced or higher organisms.

Primitive or lower organisms have **simpler body design** whereas advanced or higher organisms have comparatively more **complex body design**. Primitive organisms are considered at the first ladder on the evolutionary scale while the advanced organisms are considered at successive ladders on the evolutionary scale.

Q.16 What do we mean by biodiversity?

The vast **variety and differences** that are found in the living organisms of different ecosystems whether terrestrial, aquatic or marine collectively known as biodiversity.

Q.17 Which region is known as the region of mega diversity?

The warm and humid tropical regions of the Earth, between the **tropic of Cancer and the tropic of Capricorn**, are rich in diversity of plant and animal life. This is called the region of mega diversity.

Q.18 Will advanced organisms be the same as complex organisms? Why? How can we say that the classification of life forms will be closely related to their evolution?

(a) It is not always true that advanced organisms will have a complex body structure. But, there is a possibility that over the evolutionary time, the complexity in body design will increase. Therefore, at times, advanced organisms can be the same as complex organisms.

(b) As the characteristics that have come into existence earlier are likely to be more basic than characteristics that have come into existent later.

Q.19 What are the five kingdoms that R. Whittaker proposed? Also define the term 'species'

R. Whittaker categorized organisms in the following five kingdoms:

Kingdom Monera, Kingdom Protista, Kingdom Fungi, Kingdom Plantae, kingdom Animalia.

Species is a basic category of taxonomic classification, ranking below a genus or subgenus and having related organisms capable of interbreeding.

Q.20 Name the scientists who gave 2-kingdom and 5-kingdom classification respectively.

Two kingdom classification was given by **Carolus Linnaeus**

Five kingdom classifications were given by **Robert H. Whittaker**.

The Hierarchy of Classification - Groups

Q.21 What is the criterion for classification of organisms as belonging to kingdom Monera or Protista?

Kingdom Monera

Organisms which are **prokaryotes** belong to the kingdom Monera. They are **unicellular**organism which have **no membrane** bound nucleus and organelles.

Kingdom Protista

Organisms which are **eukaryotes** and **unicellular** belong to the kingdom Protista. They are organism with **membrane bound** definite nucleus and organelles.

Q.22 Name the levels of classification proposed by Linnaeus. What happens to the similarities among organisms as we go from top to bottom level?

Classification systems as proposed by Linnaeus use a hierarchical system in which organisms are placed into groups, at different levels, according to the features they share. These groups or levels are (from top to bottom)

1. Kingdom

2. Phylum

3**. Class**

4**. Order**

5**. Family**

6**. Genus**

7. Species

Q.23 Name the scientist who described the idea of organic evolution and the book in which he explained it. Name the scientists who classified organisms into kingdoms.

Charles Darwin first described the idea of evolution in his book 'The Origin of Species'.

Ernst Haeckel, Robert Whittaker and Carl Woese are **the scientists who classified organisms into kingdoms**

Q.24 Define species

All organism that are similar enough to **breed and perpetuate** is called species.

Q.25 Explain the basis for grouping of organisms into five kingdoms:

The basis for grouping of organisms into five kingdoms is-

(i) Nature of cells- either prokaryotic or Eukaryotic

(ii) Number of cells- Unicellular and multicellular

(iii) Presence or absence of cell wall

(iv) Mode of nutrition

Q.26 Who proposed division of Monera kingdom ? State the groups proposed

Carl Woese.

The groups are –

(i) **Archaebacteria or Archaea**

(ii) **Eubacteria or Bacteria**.

Q.27 Which are the beings that constitute the kingdom Monera?

The kingdom Monera is the kingdom of the prokaryotes, composed of bacteria and archaebacteria.

Q.28 What are the important features of Kingdom Monera?

Kingdom Monera: It includes mainly bacteria, blue-green algae, or cyanobacteria

Important features of Monera:

- Absence of well-defined nuclear or membrane-bound organelles- prokaryotic organisms.

- All of them are unicellular

- Can be autotrophic (like Cyanobacteria)or heterotrophic(mostly parasitic or saprophytic)

- Bacteria, blue-green algae and mycoplasma are the example organism belonging to the Monera kingdom.

Q.29 Why blue green algae are included under Monera and not under Plantae?

(i) Nuclear material is not enclosed with nuclear membrane and cell organelles are also not enclosed with membrane.

(ii) Do not show multicellular body design.

Q.30 What are the important features of Kingdom Protista?

Kingdom Protista: It Includes protozoans such as, Amoeba, Paramecium, diatoms etc

Important features of protista:

- Unicellular, eukaryotic organism
- The cell has well defined nucleus with nuclear membrane and organelles.
- Cell wall may or may not be present.
- Can be autotrophic or heterotrophic
- Examples-Unicellular algae- Chlamydomonas, Euglena, Diatoms and Protozoans like Amoeba and Paramecium.

Q.31 Give one example of each Protesta having cilia and flagella.

Cilia – Paramecium.

Flagella – Euglena.

Q.32 What are the important features of Kingdom Fungi?

Commonly known fungi are Yeast, mushroom, Penicillium, Aspergillus, etc.

Important features of fungi:

- Multicellular eukaryotic organisms
- Always heterotrophic (saprophytes) as they do not have chlorophyll and cannot prepare their own food by photosynthesis, live as saprophytes, parasites and symbiotic.
- Cell wall made of chitin, a complex nitrogen containing sugar that imparts toughness to cell wall.
- Mostly multicellular, only yeast is unicellular.
- Plant body contain thread-like hyphae (network is called mycelium).
- Reproduction occurs by spore formation.
- Examples- Rhizopus, Aspergillius, Pencillium and Mushroom.

Q.33 What are saprophytes?

Saprophytes are organisms which use **decaying organic material as food**. Eg., Rhizopus, yeast.

Q.34 Define moss.

Mosses are **non-vascular plants** in the land plant division Bryophyta.
Mosses **reproduce using spores**, not seeds and have no flowers. e.g., Funaria, Bryum, Sphagnum

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Q.35 What is symbiotic? Give examples.

Symbiosis is a mode of heterotrophic nutrition. It is an interaction or interrelationship between two organisms for a mutual benefit or dependence.

Lichen is an example for symbiotic nutrition. It is an association between algae and fungi. Algae are autotrophic and can manufacture food for fungi while fungi provide shelter, water and minerals to algae.

Q.36 What are the important features of Kingdom Plantae?

Important features of Plantae:

- Multicellular eukaryotic organisms
- Most of the plants contain chlorophyll. Hence, they are autotrophic
- Cell wall made of cellulose is present

Q.37 What are the important features of Kingdom Animalia?

Important features of Animalia:

- Multicellular eukaryotic organisms
- Chloroplast is absent. Hence, they have heterotrophic mode of nutrition
- Cell wall is absent

Q.38 State the list of names of five kingdom of organism with the names of organism they are composed of.

Kingdom	Types of Organisms
Monera	Bacteria and Cyanobacteria.
Protista	Unicellular organisms.
Plantae	All photosynthetic green plants.
Fungi	Lack chlorophyll and obtain their food through absorption.
Animalia	Multicellular consumer whose mode of nutrition is indigestion, digestion and assimilation of food.

Q.39 What is the difference between prokaryotic cell and Eukaryotic cell?

Eukaryotic cells contain **membrane-bound organelles**, such as the nucleus, while prokaryotic cells **do not** have **membrane-bound organelles**. The prokaryotes consists of bacteria and blue green algae and were first to rise in biological evolution

The Eukaryotic cells are found in multicellular animals, plants and fungi. Eukaryotes have arisen probably a million year after prokaryotes and much larger and complex.

Q.40 What is the difference between unicellular and multicellular organisms?

Unicellular organisms	Multicellular organisms
The body of the organism is composed of single cell	The body of the organism is composed of numerous cell
Prokaryotic in nature	Eukaryotic in nature.
Vegetative/Asexual reproduction	Sexual type of reproduction
A single cell carries out all life processes	Different cells are specialised to perform different functions
Injury of the cell can cause death of the organism	Injury or death of some cells does not affect the organism as the same can be replaced by new ones.
An example of a unicellular animal is Amoeba.	Humans are multicellular

Plant AE

Q.41 State the major divisions in the Plantae:

Major division in Plantae are:-

(i) **Thalophyta.**

(ii) **Bryophyte.**

(iii) **Pteridophyta.**

(iv) **Gymnosperms.**

(v) **Angiosperms**.

Q.42 State the criteria for deciding divisions in plants?

The criteria depends upon:-

(i) **Differentiation** of plant body components.

(ii) **Presence of transport tissues** (vascular tissues)

(iii) **Ability to produce seeds**.

(iv) **Seeds** are enclosed **in fruits or naked**.

Q.43 Describe the characteristic feature of Thyllophyta with examples:

Thyllophyta includes mainly algae and these plants are predominantly aquatic.

It includes Spirogyra, Ulothrix, Cladophora and Chara

- Plant body is thallus- not differentiated into true root, stem and leaves.
- May be unicellular or multicellular
- Cell wall is made of cellulose and reserve food material is starch.
- They have naked embryos called spores.

Q.44 What is a thallus?

Thallophyte has a simple plant body. The plant **body is not differentiated** into root, stem and leaves and is called thallus.

Q.45 Why are thallophytes called non-embryonic plants?

Thyllophytes have **simple body** (thallus) and their **gametes are unicellular**. After fertilisation, the zygote does not form an embryo. Therefore, these plants are called **non-embryonic plants**.

Q.46 Describe the characteristics feature of Bryophyta with examples:

Division Bryophyta are also called amphibians of plant kingdom:

It includes mosses, Riccia, Marchantia

Characteristic feature of Bryophyta:

- Vascular tissues namely xylem and phloem, or the conduction of water and other substances from one part of the plant body to another are absent.
- Body is differentiated into stem and leaf-like structures.
- Naked embryo called spores is present.

Q.47 Why are bryophytes called amphibians of the plant kingdom?

Bryophytes are also called amphibians of the plant kingdom because they can **live on soil**but **need water for sexual reproduction**. They are usually found in damp, humid and shaded localities.

Q.48 Describe the characteristics feature of Pteridophyta with examples:

Division Pteridophyta: Includes ferns, Marsilea, Equisetum

Characteristic feature of Pteridophyta

- Specialised vascular tissues for the conduction of water are present.
- Plant body is differentiated into true root, stem and leaves.
- Naked embryo called spores are present but seed formation is lacking

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Q.49 What are the major divisions in the plantae? What is the basis for these divisions?

Major divisions of Kingdom plantae are-

Thallophyta

Bryophyta

Pteridophyta

Gymnosperms

Angiosperms

The division is based on the following features-

- The first level of classification among plants depends on whether the ***plant body is well differentiated or not***
- The next level of classification is based on whether the differentiated body has ***special vascular tissues****(xylem and Phloem)* for the transport of water and other substances.
- Further classification is based on the ***ability to bear seeds***
- Further it is classified whether the ***seeds are naked or enclosed*** within the fruit.

Q.50 Name the two subkingdoms of plant kingdom.

Eichler in 1883 suggested a system to classify the plant kingdom which is well accepted. He said that the plant kingdom is subdivided into two subkingdoms: **Cryptogamae** and**Phanerogamae**.

Q.51 What is the characteristic feature of cryptogamae? Name the 3 divisions included in it.

In Greek, crypto means concealed or hidden and 'gamos' means marriage.

The cryptograms are **flowerless** and **seedless** plants. They are simple plants like algae, mosses and ferns which **do not produce flowers, fruits and** seeds. Since they do not have external flowers or seeds they are considered to have hidden reproductive organs. They**reproduce through spores**. The plant body in these organisms is

undifferentiated, i.e, the stems, roots and leaves don't show borders between them. Cryptograms are considered as lower plants.

They are divided into bryophyta, thallophyta and pteridophyta.

Q.52 What are the characteristic features of sub kingdom phanerogamae?

This division is made up of plants that **bear flowers and seeds** and make up the majority of the larger plants. The body is differentiated into true stem, leaves and roots. Propagation of the plant takes place with the help of seeds. Seeds are formed as a result of sexual reproduction. The male and female gametes (sex cells) fuse together inside the ovary (female part of the flower) and develop into the seed. In some plants seed is not produced inside an ovary.

Phanerogamae is made into two further divisions.

- **Gymnosperms (naked seeded plants)**
- **Angiosperms (Seed borne within a fruit)**

Q.53 Describe the classifications of Phanerogams:

Phanerogams are divided into Gymnosperms and Angiosperms.

Gymnosperms: The term 'Gymnosperms' is made from two Greek words: gymno– means naked and sperma– means seed.

Seeds are naked and reproductive organs are cones.

They are non-flowering plants and are usually perennial, evergreen and woody. Example- Pinus, deodar, fir

Angiosperms: The Word 'Angiosperms' is made from two Greek words: angio means covered and sperma– means Angiosperm have covered seeds(they are enclosed inside fruits)

They are flowering plants and flowers are the reproductive organs.

Example-Coconut, palm, mango

Q.54 How angiosperms are divided further?

Angiosperms are divided into 2 groups on the basis of the number of cotyledons present in the seed.

Monocotyledonous or monocots: These are the plants with seeds having a single cotyledon.E.g., maize, wheat, rice etc

Dicotyledonous or dicots: These are plants with seeds having two cotyledons. E.g., Pea, gram, bean etc

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Q.55 Give any 5 difference between monocot and dicot plants

MONOCOTS	DICOTS
Seeds contain one cotyledon	Seeds contain two cotyledon
Leaves have parallel venation	Leaves have branched web like venation
Fibrous root system is found	Tap root system is found
No secondary growth	Secondary growth occurs
Flowers are usually tetramerous(3 petals)	Flowers are usually pentamerous(five petals)

Q.56 Give uses of lichens.

i) One of the most important uses of lichens is their **sensitivity to pollution**.

ii) Lichens have been used for centuries to **create natural dyes** for fabrics.

iii) Many lichens contain acids and other essential oils that are useful in **making perfumes and scents**.

iv) Some lichens are used in **medicines**

Q.57 Ingestion of solid food occurs in which type of nutrition?

Ingestion of solid food occurs in **holozoic** type of nutrition.

Q.58 Name some edible fungi and their uses.

Edible fungi and their uses are as follows

(i) Yeast has been used as leavening agent for the production of bread

(ii) The first antibioticused in modern medicine, penicillin, was isolated form *Penicillium*

(iii) Mushrooms have fleshy fruit body with certain aroma and flavors as well as good nutritional properties and are used mostly as food.

(iv) Fungi such as the Chinese caterpillar fungus, which parasitize insects, can be extremely useful for controlling insect pests of crops

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Q.59 Bacteria, fungi and plants all have the cell wall, but they are placed in the different groups or division. Why?

Bacteria, fungi and plants showed a characteristic difference in their walls composition –

In *bacteria*, the cell wall is made of **peptidoglycans**;

In *fungi*, the cell wall is made of **chitin** (the same substance that makes the exoskeleton of arthropods)

In *plants*, the cell wall is made of **cellulose** too. Therefore, bacteria, fungi and plants are placed in the different groups or division.

Q.60 What is chemical characteristics of fungal cell wall?

In fungi, the cell wall is made of **chitin**.

Q.61 Give one use of lichen.

Lichens are great indicators in telling us how polluted the air is, because lichens are**sensitive to polluted air** and are the first to disappear in that case.

Q.62 Classify the following seeds into dicot and monocot : Wheat, Maize, Bean, Gram.

Dicot seeds - Bean, Gram.

Monocot seeds – Wheat, Maize

Q.63 While walking along roadside, Sunil asked his father, a biology teacher, whether some small, green, non-flowering, leafy and thalloid plants, having little differentiation of body and growing along pavement are of any use to us. Father answered that these plants are small but they play very important role in maintaining green cover on the land.

(i) To which group these small thalloid, green, non-flowering plants belong?

(ii) In what way bryophytes are useful to us?

(iii)Which other groups of plants act as colonizers of barren rocks and make land suitable for growth of higher plants? Do these plants play some role in pollution monitoring?

(i) These small thalloid, green, non-flowering plants belong to the group called**bryophytes**.

(ii) Bryophytes are also used in horticulture as **soil additives, ornamental material for cultivation, and for beautification of gardens**.

(iii) Mosses and Lichens act as **colonizers of barren rocks** and make land suitable for growth of higher plants. They are also good indicators of atmospheric quality.

Q.64 Why are cotyledons called seed leaves?

Cotyledons are actually part of the seed. They are the **first part of the plant** to emerge and they look like little green leaves (hence seed leaves). The cotyledons store

food reserves for the growing seedlings. The plant relies on this stored food for early growth. The cotyledons can photosynthesise which supplies extra energy until the first true leaves emerge.

Animalia

Q.65 Name the group of sessile animals that also have numerous pores all over the body?

Kingdom Porifera.

Q.66 What are the general characteristics found in all animals?

General characteristics found in all animals are-

- All animals are multicellular, eukaryotic and heterotrophic
- All exhibit locomotion
- Most of the animals have sense organs and nervous system
- Nutrition is generally ingestive
- Reproduction is generally sexual.

Q.67 In how many phyla, the animal kingdom is divided into?

Kingdom Animalia is divided into nine phyla based on the extent and type of the body design differentiation found-

- **Porifera(sponges)**
- **Coelentrata(jellyfish, corals etc)**
- **Platyhelminthes(flatworms)**
- **Nematoda(roundworms)**
- **Annelida(earthworms)**
- **Arthropoda(insects, spiders, crabs etc)**
- **Mollusca(snails, oysters etc)**
- **Echinodermata(starfishes, sea urchins etc)**
- **Chordata(animals with backbone)**

Q.68 Why are air bladders present in fishes?

The air bladders help a fish to adjust its buoyancy in water. In other words it helps a fish float or sink no matter the size. Air bladder is also known as the **swim bladder**. The swim bladder allows the fish to **move up and down** through the water or **remain motionless** in one place.

Q.69 What are the characteristic features of Kingdom Porifera?

Porifera are pore-bearing animals called sponges.

- Sponges are the simplest multicellular animals with cellular differention, lacking organisation of tissues.
- They are mostly marine, fixed to the substratum and look like plants.
- Body is asymmetrical.
- The body has numerous pores on the surface, a cavity in the centre called spongocoel and a single large opening at the upper end called osculum.
- Circulating water canal system distributes food and oxygen to all the cell
- The body is covered by a hard outside layer or skeleton.
- Reproduction occurs by regeneration, asexual and sexual methods.

Q.70 What are the characteristic features of Kingdom Coelenterate?

Coelenterates are aquatic mostly marine; Hydra is found in fresh water.

- They have tissue level of organisation.
- Body is radically symmetrical
- They have central cavity called coelenteron, which has one opening.
- The body is made of two layers of cells: one makes up cells on the outside of the body, and the other makes the inner lining of the body.
- Some of these species live in colonies (corals), while others have a solitary life–span (hydra).
- Reproduction takes place by sexual and asexual methods.
- Hydra, jellyfish and sea anemones are common examples.

Q.71 Define radial symmetry?

Radial symmetry means that the **left and the right halves** of the body have the **same design**.

Q.72 Name the following :

(a) Free living Platyhelminthes ;

(b) Scientific name of pork tape worm.

(a) Planaria

(b) *Taenia solium*.

Q.73 Why are Protozoa regarded as early animals?

Protozoa are regarded as early or primitive animals because

(i) They have a **cellular grade** of organization, e.g. Amoeba, paramecium.

(ii) A **single cell** performs **all functions**; therefore there is no division of labour.

(iii) They are **microscopi**c and exhibit a primitive mode of reproduction.

Q.74 What is the common name of annelids?

Segmented worms.

Q.75 Name the locomotory organs in insects.

Many adult insects use six legs for walking. ie. They have **three pairs of jointed legs** that allows for rapid walking while always having a stable stance (posture). They also have two pairs of wings that are mostly used for flying.

Q.76 What are the characteristic features of platyhelminthes?

The characteristic features of platyhelminthes-

- The body is flat, leaf-like or tape-like, bilaterally symmetrical (left and right side of the body are similar)
- They are triploblastic with organ system of organisation
- Respiratory and circulatory systems are under developed
- Excretion occurs through flame cells
- The nervous system is primitive but with a brain
- They are either free-living or parasitic. Some examples are free-living animals like planarians, or parasitic animals like liver flukes.

Q.77 Why are members of phylum Platyhelminthes called as flatworms?

Members of phylum Platyhelminthes are called flatworms because their bodies are flattened **dorso-ventrally**, meaning from top to bottom. Therefore, these creatures have a**leaf-like** or **ribbon-like** apperance. They include *Fasciola hepatica* (liver fluke), *Taenia solium* (tapeworm), *Schistosoma* (blood fluke), *Planaria* etc

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Q.78 Define triploblastic animals?

Animals having a body made of **three germ layers** namely, ectoderm, mesoderm and endoderm. Platyhelminthes are the first triploblastic animals.

Q.79 What are the characteristic features of Nematoda?

The **phylum Aschelminthes** is also known as Nematoda, and its members are nematodes. The members of this phylum are roundworms, and many are microscopic.

The characteristic features of Nematode are-

- The nematode body is also bilaterallysymmetrical and triploblastic.
- Body is cylindrical.
- Organ grade body organisation is found
- They also have a digestive tract open at both the mouth and anus. This tract is suspended in a body cavity that is said to be false, so it is called a *pseudocoel*.

- These are very familiar as parasitic worms causing diseases, such as the worms causing elephantiasis (filarialworms) or the worms in the intestines (roundworm or pinworms).

Q.80 What are the characteristic features of Annelida?

The characteristic features of Annelids are-

- Annelids are segmented worms
- They are triploblastic and bilaterally symmetrical
- They have true body cavity (coelome). This allows the true organs to be packaged in the body structure
- Extensive organ differentiation is found
- Digestive system is well developed
- Respiration is through gills or skin
- Circulatory system is usually closed.
- These animals are found in a variety of habitats– fresh water, marine water as well as land. Earthworms and leeches are familiar examples

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Q.81 Which are the morphological features that differentiate the beings of the phylum Annelida from nematodes and platyhelminthes?

Platyhelminthes are worms with flat bodies (flatworms), nematodes are worms with cylindrical but not segmented bodies (roundworms). Annelids are cylindrical worms with segmented bodies.

Q.82 Define Aschelminthes:

Aschelminthes is a phylum of **unsegmented**, **triploblastic, pseudocoelomate, cylindrical**or **thread-like worms** having **bilateral symmetry** and body wall covered with cuticle and epidermis.

Q.83 Mention the characteristic features of Anthropoda?

The characteristic features of Anthropoda are-

- Anthropoda is the largest group of animals.
- These animals are triploblastic, bilaterally symmetrical and segmented.
- They have jointed legs (the word 'arthropod' means 'jointed legs').
- There is an open circulatory system, and so the blood does not flow in well-defined blood vessels.
- Coelomic cavity is blood-filled(haemocoel)
- Some familiar examples are prawns, butterflies, houseflies, spiders, scorpions and crabs

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Q.84 Define haemocoel:

When the coelomic cavity is **filled with blood**, it is known as haemocoel.

Q.85 What is pseudocoelom?

The space between **alimentary canal and body wall** that lacks lining of mesodermal epithelium is known as pseudocoelom.

Q.86 Mention the characteristic features of Mollusca:

The characteristic features of Mollusca are-

- They have soft body covered with a protective shell of calcium carbonate.
- There is bilateral symmetry.
- The coelomic cavity is reduced.
- There is little segmentation.
- They have an open circulatory system and kidney-like organs for excretion.
- There is a foot that is used for moving around.
- Examples are snails and mussels

Q.87 Based of which character the phylum Echinodermata has been named?

In Greek, echinos means hedgehog, and derma means skin. Thus, these are **spiny skinned**organisms. Thus, the phylum Echinodermata has been named based on the presence of spiny skin.

Q.88 In which habitats do molluscs live? Name some examples of the phylum Mollusca?

Molluscs can be found in the sea, freshwater and in terrestrial environments. Snails, octopuses, squids and oysters are examples of molluscs.

Q.89 What is the morphological feature of molluscs after which the phylum is named?

The word "mollusc" means "**soft thing**". Molluscs have soft bodies and this feature explains the name of the phylum.

Q.90 Which type of circulatory system do molluscs have? How can it be compared to the circulatory system of annelids?

With the exception of few, most of the molluscs have an **open circulatory system**, i.e., the blood circulates within vessels, from the heart, but it also fills open cavities. In annelids, the **circulatory system is closed**, i.e., the blood circulates only inside blood vessels.

Q.91 Mention the characteristic features of Echinodermata:

The characteristic features of Echinodermata-

- In Greek, echinos means hedgehog, and derma means skin. Thus, these are spiny skinned organisms.
- These are exclusively free-living marine animals.
- They are triploblastic and have a coelomic cavity.
- They also have a peculiar water-driven tube system that they use for moving around.
- They have hard calcium carbonate structures that they use as a skeleton.
- Examples are starfish and sea urchins.

Q.92 How can the endoskeleton of echinoderms be characterized in comparison to analogous structures present in vertebrates, arthropods and molluscs?

The echinoderm skeleton is internal, i.e., it is an endoskeleton. It is made of calcium carbonate (calcareous).

Vertebrates also have internal skeleton made of bones and cartilages.

Arthropods have an external carapace made of chitin, a chitinous exoskeleton.

Some molluscs present a calcareous shell that works as exoskeleton.

Q.93 What is osculum?

The body of sponge is porous and the pores are called **ostia**. Single large opening or pore is called osculum.

Q.94 Animals that belong to the phylum Coelenterata are diploblastic. What do we mean by diploblastic animals?

Diploblastic animal means animals having **body made of two embryonic or germ layers**of cells. Body walls of animals belonging to phylum coelenterata are made up of two germ layers, of which the outer layer is called ectoderm and inner is endoderm.

Q.95 Name two phyla which have open circulation:

Anthropoda, Mollusca and Echinodermata

Q.96 Which type of symmetry is present in-

a) Starfish

b) Earthworm

a) Starfish- Radial symmetry

b) Earthworm- bilateral symmetry

Q.97 Mention the characteristic features of Protochordates

The characteristic features of Protochordates-

- These animals are bilaterally symmetrical,triploblastic and have a coelom.
- Notochord is present in early stages of development, which may persist or disappear later.
- Protochordates are marine animals.
- Examples are Balanoglossus, Herdemania and Amphioxus

Q.98 What is a notochord? What does it do?

The notochord is a **long rod-like support structure** (chord=string) that runs along the back of the animal separating the nervous tissue from the gut. It provides a place for muscles to attach for ease of movement.

Q.99 Mention the characteristic features of chordates:

All chordates possess the following features:

(i) They have a notochord

(ii) All chordates have a dorsal nerve cord

(iii) They are triploblastic

(iv) They have paired gill pouches

(v) Chordates are coelomate.

Q.100 What are the two mains divisions of the Phylum Chordate?

Chordates are divided into **protochordates** and **vertebrates**.

Q.101 How are animals belonging to protochordates different from animals belonging to vertebrates?

Animals that have notochord are categorised into **chordata**.

Some animals like Balanoglossus, Herdmania, Amphioxus etc. have a notochord, which is not present at all stages in their lifecycle, nor does it run the entire length of an animal's body. Therefore, these animals are kept in a separate sub-phylum named **Protochordata**under phylum chordata.

In animals where the notochord is present throughout the life cycle and also has given rise to the vertebral column are called **vertebrates**. The members of sub-phylum Vertebrata under Phylum Chordata are advanced chordates that include animals belonging to classes- Pisces,Amphibia, Reptilia, Aves and Mammalia..

Q.102 Difference between diploblastic and triploblatic:

Diploblastic	Triploblastic
Animals develop from 2 germinal layers	Animals develop from 3 germinal layers
Outer ectoderm and inner endoderm	Outer ectoderm, middle mesoderm and inner endoderm
E.g., Coelentrates	E.g., Arthropods, vertebrates, molluscs, Echinoderms

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Q.103 What are flame cells?

Flame cells are **excretory structures** of Platyhelminthes. Besides excretion, they are also osmoregulatory in function.

Q.104 Why fungi are called saprophytes?

Fungi are known as saprophytes because they feed on dead and decaying organic matter.

Q.105 Name the locomotory organs of protozoans.

Locomotory organs of protozoans are **cilia, flagella** and **pseudopodia.**

Q.106 Give one word for the following:

i. The smallest unit of classification

ii. The largest unit of classification

iii. A collection of related species

iv. A group of related families

i. Species

ii. Kingdom

iii. Genus

iv. Order

Q.107 What is meant by an incomplete digestive system?

Animals with an incomplete digestive system are those in which the digestive tube has only **one opening** (cnidarians, platyhelminthes).

Vertebrata

Q.108 What are the characteristic features of vertebrates?

The members of the sub-phylum vertebrates are advanced chordates.

These animals have a **true vertebral column** and **internal skeleton**, allowing a completely different distribution of muscle attachment points to be used for movement.

Vertebrates are **bilaterally symmetrical,triploblastic, coelomic** and **segmented**, with complex differentiation of body tissues and organs.

All chordates possess the following features:

(i) Have a notochord

(ii) Have a dorsal nerve cord

(iii) Are triploblastic

(iv) Have paired gill pouches

(v) Are coelomate.

Q.109 What is the destination of the notochord in vertebrates and in protochordates?

In vertebrates, the **notochord disappears** and gives birth to the spinal column (vertebral column). In protochordates, the **notochord remains** for the rest of the life.

Q.110 Explain how animals in vertebrata are classified into further subgroups:

Animals in vertebrata are classified into 5 classes namely

(i) Class Pisces

(ii) Class Amphibia

(iii) Class Reptilia

(iv) Class Aves

(iv) Class Mammalia

Q.111 What are the characteristic features of Pisces?

The characteristic features of Pisces are-

- These are fish.
- They are exclusively water-living animals.
- Their skin is covered with scales/plate
- They obtain oxygen dissolved in water by using gills.
- The body is streamlined, and a muscular tail is used for movement.
- They are cold-blooded and their hearts have only two chambers.
- They lay eggs.
- Some have skeletons made entirely of cartilage, such as sharks, and some with a skeleton made of both bone and cartilage, such as tuna or rohu

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Q.112 What are the characteristic features of Amphibians?

The characteristic features of Amphibians are-

- Amphibia are the first land vertebrates.
- They are adapted to live in water and on land.
- Skin is smooth without scales and has mucus glands in the skin to keep the skin moist.
- Respiration is through either gills or lungs.
- They have a three-chambered heart and are cold-blooded animals.
- They lay eggs.
- Frogs, toads and salamanders are some examples

Q.113 What are the differences between vertebrates and the other chordates?

Vertebrates are different because they have a **spinal column** (vertebral column). In these animals the notochord of the embryonic stage is substituted by the **vertebral column** in adults.

Q.114 How many carnivores belonging to cat family did you see in the zoo? What is given to them to eat?

Three (Lion, Tiger, Leopard) – Flesh of animals is offered to them for eating.

Q.115 Give scientific terms for the following:

(a) True internal body cavity of animals.

(b) A solid, unjointed rod present in chordates at some stage of life.

(c) Creeping vertebrates.

(d) Pore bearing animals.

(a) Coelom

(b) Notochord

(c) Reptilia

(d) Porifera (sponges).

Q.116 (a) Birds and mammals share one common feature. Give details.

(b) Name the phyla in which animals have soft-bodies covered with a hard shell.

(a) Both birds and mammals have a four-chambered heart.

(b) Phylum-Mollusca have animals that have soft bodies covered with a hard shell.

Q.117 Name two groups of warm blooded animals with four-chambered heart.

(i) Aves

(ii) Mammals.

Q.118 How is the skin of amphibians moist?

The skin of amphibians is moist because they are covered in a mucous coating. They**secrete mucus** to help them keep their skin moist which aids in their ability to breathe through their skin. The mucous often contains other chemicals, like antibacterial or anti fungal to help protect the amphibian.

Q.119 How does amphibian overcome the unfavourable conditions?

Some amphibians become inactive when conditions are unfavourable for survival. This period of inactivity is called **aestivation** when it occurs during hot, dry weather and **hibernation** when it occurs in response to cold temperatures. Activity resumes when favourable conditions return.

Q.120 Why do we keep both snake and turtle in the same class?

Both snake and turtle are kept in same class, because both

- Are cold-blooded.
- Have thick tough skin with scales.
- Breathe through lungs
- Have three-chambered heart.
- Lay leathery eggs.

Q.121 What is a cold- blooded animal?

An animal whose **body temperature changes** with the temperature of the environment is called cold- blooded animals. E.g., Frogs, snake, lizards etc.

Q.122 How is the skin of amphibians different from pisces and reptiles?

Skin is smooth **without scales** and **has mucus glands** in the skin to keep the skin moist. Scales cover the skin of fishes to protect against water whereas reptiles skin has horny scales to protect against dry conditions.

Q.123 What are the five classes of vertebrates? To which of these do human beings belong?

The five classes of vertebrates are: **fishes, amphibians, reptiles, birds and mammals**. Humans classify as mammals.

Q.124 What is the group of the phylum Chordata that first colonized the terrestrial environment? From which habitat did they come?

Amphibians, partially aquatic partially terrestrial animals, were the first chordates that colonized the dry land. They came from the aquatic habitat and were originated from fishes. (Nevertheless the first completely terrestrial chordates were the reptiles).

Q.125 What are the characteristic features of Reptilia?

The characteristic features of Reptilia are

- Reptilia are the first land vertebrates of the warmer regions.
- Horny scales cover the horny skin.
- These animals are cold-blooded
- They breathe through lungs.
- While most of them have a three-chambered heart, crocodiles have four heart chambers.
- They lay eggs with tough coverings and do not need to lay their eggs in water, unlike amphibians.
- Snakes, turtles, lizards and crocodiles fall in this category

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Q.126 What are the characteristic features of Aves?

The characteristic features of Aves are-

- These are warm-blooded animals and have a four-chambered heart.
- They lay eggs.
- There is an outside covering of feathers, and two forelimbs are modified for flight.
- They breathe through lungs.
- All birds fall in this category

Q.127 What are the characteristic features of Mammals?

The characteristic features of mammals are-

- Mammals are warm-blooded animals with four-chambered hearts.
- They have mammary glands for the production of milk to nourish their young.
- Their skin has hairs as well as sweat and oil glands.
- Most mammals familiar to us produce live young ones. However, a few of them, like the platypus and the echidna lay eggs, and some, like kangaroos give birth to very poorly developed young ones.

Q.128 What are the differences between animals belonging to the Aves group and those in the mammalian group?

In aves, body is covered with feathers; while in mammals, body is covered with hairs. Mammary glands are absent in aves. Forelimbs of aves are modified into wings which is not the case in mammals. Aves are oviparous, while most of the mammals are viviparous.

Q.129 Mention the function and location of notochord.

Notochord is a supporting structure found in lower chordates and in embryos of all higher chordates. It functions as a major **axial supporting structure** just as vertebral column does in our body and it runs along the back of the animal separating the nervous tissue from the gut.

Q.130 Rahul and his mother were walking in the garden. Rahul saw mushrooms growing on decaying leaves. He tried to uproot them. He was stopped by his mother.

(i) Identify the kingdom to which the organism belongs to.

(ii) Write the mode of nutrition exhibited by the mushrooms.

(iii) Why did Rahul's mother stop him?

(i) Fungi

(ii) Saprophytic

(iii) All mushrooms are not edible. Some mushrooms can sicken or kill you if eaten. That was the reason that Rahul's mother stopped him.

Q.131 List a few flight adaptations in birds.

Flight adaptations of the birds are the following:

- Their forelimbs have become modified into wings for flying.
- Bird's bones are hollow which makes birds' bodies lightweight.
- Birds have feathers that help them fly. The long flight feathers on the wings and tail help birds balance and steer.
- The respiratory system of birds is also adapted to the demands of flight. Their bodies have air sacs helping them in double respiration

- Keratin beak is much lighter than a bony jaw with teeth
- Rapid, efficient digestion minimizes weight of digesting food.
- Body is streamlined to reduce air resistance during its flight.
- Ovaries and testes are reduced in size except in the breeding season.
- Birds have short, light and compact body as compared to other animals.
- Eyes are large, with wide field of view and binocular vision

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Q.132 Why whales are not grouped in the fishes?

Originally, people thought that whales were very large fish because their bodies have a similar shape to that of fish. In 1778, Swedish biologist, **Linnaeus**, recognized that whales were not fish but mammals.

They share some common characteristics of all mammals.

1. They are **endothermic**: Their body-core temperature stays the same; it does not change with the temperature of their environment.

2. They **breathe** air with **lungs**.

3. They give **birth to live young**. Mothers (called cows) **suckle their young** (calves), on milk secreted by mammary glands.

4. They **have hair**. Although they are not covered in hair or fur like many mammals, whales have some bristles, usually on their heads.

5. They have **four-chambered heart** like mammals unlike fishes that have a two-chambered heart.

Q.133 Which group – Pisces or Amphibia is advanced? Give two reasons.

The group-Amphibia is advanced than Pisces because:

(i) The amphibians have three-chambered heart whereas fishes have two-chambered heart

(ii) Amphibians respire through gills or lungs while fishes have gills for respiration.

(iii) Amphibians are adapted to live in both land and water whereas Pisces can live only in water.

Q.134 (i)Name an animal that gives birth to poorly developed young ones and nurtures them into full development after birth.

(ii) Name two egg-laying mammals.

(i)Kangaroo

(ii) Echidna, Platypus.

Nomenclature

Q.135 What is meant by nomenclature?

Nomenclature refers to assigning a unique name to an organism. Two types of names have been given to organisms- **Common name** and **scientific name**.

Q.136 What is meant by scientific name?

A scientific name is the one given by biologists and represents a particular organism in every part of the world. Scientists ensure that a name being given by them has not been used earlier for any other organisms.

Q.137 What is meant by Binomial Nomenclature?

The system of scientific naming or nomenclature we use today was introduced by **Carolus Linnaeus** in the eighteenth century. The system developed by Linnaeus is known as**Binomial Nomenclature**.

Binomial Nomenclature is the system of assigning scientific names to plants and animals. It consists of two words, first **generic** and second **specific**.

Q.138 What are the advantages of scientific name?

The names are universally accepted and understood.

Every species has a specific name. No two species share a common specific name.

The names indicate relationship of a species with others present in the same genus.

Q.139 Rewrite the following scientific names correctly, if incorrect.

(i) Amoeba Histolytica;

(ii) Atthala rosea (holly-hock);

(iii) Brassica Comestris

(i)Entamoeba *histolytica*

(ii) *Alcea rosea* (common *hollyhock)*

(iii) Brassica campestris

(iv) Brassica oleracea (Cabbage)

Q.140 What is the scientific name of humans?

Homo sapiens.

Q.141 What conventions are followed while writing the scientific names?

Certain conventions are followed while writing the scientific names:

1. The name of the genus begins with a capital letter. E.g., Panthera

2. The name of the species begins with a small letter. E.g., tigris

3. When printed, the scientific name is given in italics. E.g., *Panthera tigris*

4. When written by hand, the genus name and the species name have to be underlined separately

E.g., *Panthera tigris*

Value based questions: -

Q.1 Sheela shouted there is wall lizard in the room running on the wall. She started throwing shoes and other articles to hurt the lizard. Her mother came in the room and cools down the daughter and said it will not harm you. Do not hurt or kill it.

Answer the following questions based on the above information:

(a) Whether the wall lizard is poisonous?

(b) What is its food and how can it run on the vertical wall?

(c) Give one reason to justify that Sheela's mother action is environment friendly.

(a) Wall lizards found in our houses are not poisonous.

(b) It eats insects. Lizards have pads on their feet. These pads consist of wide plates or scales and are present below their fingers and toes. The outer layer of each plate or scale is composed of innumerable tiny hooks for-med by free, bent tips of cells. These minute hooks create the conditions like a suction pump and thus, enable lizards to run up on apparently smooth walls and even upside down on plaster ceilings.

(c) Sheela's mother avoided the killing of a living organism by clearing the myths that were believed by her daughter and maintain the food chain.

Q.2 During a field-trip some students visited an agricultural farm and saw a few birds eating earthworms. They enjoyed the scene and then they also

started picking and killing the earthworms for pleasure. The farmer strongly objected and asked them to leave the field.

Read the above passage and answer the following questions:

(a) What could be the reason behind such a behaviour of the farmer?

(b) Which phylum do earthworm belong to?

(c) Give any two identifying features of an earthworm

(d) What values do you find missing in the student's behaviour?

(a) The earthworm is considered to be the friend of a farmer since they further turn and loosen the soil .Like microbes, they also add humus to it by decomposing the dead plants and animals in the soil This was the reason on which farmer reacted.

(b) Earthworm belongs to the phylum – Annelida.

(c) Two identifying features of earthworm are

(i) Segmented bodies are key identifying features of earthworms as well as important structural adaptations.

(ii) Type and position of body bristles or satae.

(d) Values which are missing in the student's behaviour were destructive behaviour and sadistic behaviour of the kids

Previous Year Questions

1 Mark Questions

Q.1 Name the term which is used for the following : -
(i) The left and right halves of the body have the same design.
(ii) Animal tissue differentiated from the three embryonic germ layers.

[Board, 2012]

(i) Bilateral symmetry
(ii) Triploblastic

Q.2 Shyam knew the correct scientific name of Mango, but did not follow the conventions while writing it and wrote it as Mangifera Indica. Rewrite the scientific name as per the conventions.

[Board, 2012]

Mangifera indica.

Q.3 What is the lowermost category in the hierarchy of classification of groups of organisms?

[Board, 2012]

Species.

Q.4 Name the phylum in which the animals have water vascular system.

[DAV 2006]

Echinodermata.

2 Marks Questions

Q.5 The body of an organism is streamlined and has feathers on its body. Identify the organism and write one specific feature of it.

[Board, 2014]

Aves.
Specific feature of Aves is that they are warm –blooded having a four chambered heart and modified forelimbs for flight.

Q.6 An animal is dorsoventrally flattened. It has three embryonic germ layers and is acoelomate. Which phylum does it belong to? What are they commonly called? Give one example.

[Board, 2012]

The animal belongs to phylum Platyhelminthes.
They are commonly known 'flatworms'.

One example – Planaria or liver fluke or tape worm.

Q.7 What is a parasite? Give two examples.

[Board, 2012]

A parasite lives in a close relationship with another organism, its host, and causes it harm. The parasite is dependent on its host for its life functions. E.g., Head lice, leech, bed bug.

Q.8 Kingdom Fungi have cell wall, but still it cannot be classified under kingdom Plantae? Give any two reasons.

[Board, 2012]

Fungi are not classified in plant kingdom because their cell wall is different from plant cell and is made up of chitin. They also lack chlorophyll and hence cannot do photosynthesis and are autotrophic.

Q.9 (a) Name and define the mode of nutrition in Mushroom.
(b) Name the symbiotic life form, which is seen as slow, growing large, coloured patches on the bark of trees.

[Board, 2012]

(a) Saprophytic nutrition -
Organisms feed on dead or decaying organic matter are called saprophytes and their mode of nutrition as saprophytic nutrition (In Greek- 'Sapros' means rotten and 'trophos' means feeder).
(b) Lichen.

Q.10 The cat, platypus and man are all mammals, yet one of the most unique features of mammals helps to divide them into two groups. What is that feature? Mention two other characteristic features that are common to all the three animals.

[Board, 2012]

(a) Both cat, platypus are oviparous. *Oviparous animals* are animals that reproduce by laying eggs while man is viviparous. *Viviparous animals* bear live young that have developed inside the mother's body.

(b) Characteristics of mammalia-
i) They are warm blooded animals
ii) Mammary glands for the production of milk for their off springs

3 Marks Questions

Q.11 Associate the following features with groups in which they first appeared.
(a) Vascular tissues
(b) Notochord
(c) Seeds inside fruits

[Board, 2014]

(a) Vascular tissue- Gymnosperms
(b) Notochord- Cephalochordates
(c) Seeds inside fruits –Angiosperm

Q.12 State reasons for the following:
(a) Fungi are called saprophytes
(b) Platyhelminths are called so,
(c) Birds have hollow bones.

[Board, 2012]

(a) Fungi cause decay by releasing enzymes onto the dead animal or plant. These break down complex compounds into simple soluble ones that can be absorbed by decomposers. Organisms that feed on dead material in this way are called saprophytes.

(b) Platyhelminths or flatworms are called so because they are dorsoventrally flattened.

(c) Birds have thin, hollow bones to lighten their weight and make it easier for them to fly.

Q.13 State reasons for the following :
(a) Protists have appendages like cilia or flagella.
(b) Angiosperms are called so.
(c) Fish have scales on their body.

[Board, 2012]

(a) Protista has appendages like cilia and flagella for locomotion and gathering food.

(b) 'Angio' means covered and 'sperma' means seed. This group is usually referred to as angiosperms because, as their name implies, their seeds are enclosed in a carpel (in a vessel). The carpel is the primary feature that distinguishes angiosperms from gymnosperms.

(c) Firstly, it acts as a protective layer so that harmful objects, fungus, bacteria and parasites cannot enter the fish body Secondly, they are present in overlapping pattern and only small part of scale is visible which makes the fish body smooth but itself the scales are hard. Scales allows the fish to move easily in vertical and horizontal direction in water
Thirdly, it protects their bodies from rotting in water.

Q.14 Give reasons for the following:
(a) Echidna and platypus lay eggs, but are considered as mammals.
(b) Crocodile has four, chambered heart, but still is a reptile.
(c) Birds have pneumatic bones.

[Board, 2012]

(a) Echidna and platypus lay eggs, but are considered as mammals because
(i) They are warm blooded animals
(ii) They all have four chambered heart
(iii) Mammary glands for the production of milk for their off springs
(iv) Their skin has hairs as well as sweat and oil glands.

(b) Crocodile has four, chambered heart, but still is a reptile because they have dry, non-glandular skin, epidermal scales are also present. They are also cold blooded and oviparous.

(c) Birds have light weighted bones with internal spaces filled with air. These bones are called pneumatic bones. This feature reduces the corporal density of the animal facilitating the flight.

5 Marks Questions

Q.15 Propose three examples of characteristics used for hierarchical classification. Based on these, develop the definition of characteristics. Why the characteristics of body design used for classification of plants is different from those used for classifying animals?

[Board, 2014]

(i) Characteristics used for hierarchical classification of living organism's are-
(a) Their cellularity, whether unicellular or multicellular
(b) The mode of nutrition
(c) The mode of reproduction

(ii) Characteristics mean features or qualities of any organism.

(iii) The characteristics of body design used for classification of plants is different from those used for classifying animals because the basic body designs are different based on the need to prepare food or obtain it by consuming other organisms.
Plants have structures like chloroplasts which contain chlorophyll necessary for the synthesis of food. Organisms that acquire food lack such structures.

Q.16 (i) State two basis of classifying plants and animals into different categories.
(ii) List three characteristics features of fungi.
(iii) Some fungal species live in permanent, mutually dependent relationships with cyanobacteria.
What is this relationship called? Where are they found?

[Board, 2013]

(i) Plants and animals are totally different from one another. They are classified on basis as follows:
Plants and animals are totally different from one another in the following ways-
(1) Food preparation
(2) Movement
(3) Body parts
(4) Respiration
(5) Reproduction

(ii) Three characteristic features of fungi are-
a) Cell wall is made of chitin
b) Mode of nutrition is heterotrophic
c) They are saprophytes.

(iii) Symbiotic relationship.
Symbiosis is a situation in which 2 different organisms live together in close association.
They occur as greyish-green growths on bare rock surfaces, mountain tops, rocky seashores, bark of trees, on the ground, stone walls etc.

Q.17 (a) List any two main feature of chordates.
(b) Name the classes of vertebrates which have the following characteristics
(i) Animals have streamlined body and gills for breathing.
(ii) Animals are found both on land and in water.
(iii) Animals have mammary glands for the production of milk to nourish their young ones.

[CBSE, 2013]

The two main features of chordates are-
(a)
(i) They have notochord
(ii) They are true coelomate animals and triploblastic.

(b)
(i) Pisces have streamlined body and gills for breathing
(ii) Amphibians are found both on land and in water
(iii) Mammals have mammary glands for the production of milk to nourish their young ones.

Q.18 Write one point of difference each between the following
(a) Porifera and coelenterate
(b) Birds and reptiles

[CBSE, 2013]

(a) Porifera and coelenterate

Porifera	Coelenterate
Poriferans are 'pore-bearing' animals, i.e., the body has many pores all over	Coelenterata means hollow gut – the body cavity with a single opening to the outside coelenteron.

(b) Birds and reptiles(consider any one difference)

Birds:
1. They have four-chambered hearts.

Reptiles:
1. They have three-chambered heart.

Q.19 Name the five classes of vertebrates and compare any two on the basis of their:
(i) Habitat
(ii) Covering of skin
(iii) Respiratory organs
(iv) Chambers of heart
(v) Reproduction.

[Board, 2012]

Basic diff.	Pisces	Amphibia	Reptilia	Aves	Mammali
HABITAT	Aquatic	Both in water and land	Both in water and land	Land aerial	Mainly la
SKIN COVER	Scales	Mucus gland in skin	Scales	Feathers	Hair
RESPIRATORY ORGAN	Gills	Gills and lungs	Lungs	Lungs	Lungs
CHAMBERS OF HEART	2	3	3	4	4
RE-PRODUCTION	Lay eggs in water	Lay eggs in water	Lay eggs on land	Lay eggs	Give birth babies young on