CBSE Class 9 Science
Important Questions
Chapter 7
Diversity in Living Organisms

1 Marks Questions

1. In which kingdom will you place an organism which is single celled, eukaryotic and photosynthetic?

Ans. Kingdom Protista.

2. Which division among plants has the simplest organisms?

Ans. Division thallophyta.

3.The lowest category of classification is –

(a) phylum
(b) genus
(c) species
(d) family

Ans. (c) species

4. Prokaryotic organism is found in kingdom.

(a) protista
(b) fungi
(c) monera
(d) plantae

Ans. (c) monera

5. Which of the following structures are characteristics of reptiles but not of

amphibians?

(a) Scales
(b) Lungs
(c) Smooth moist skin
(d) Vertebral Column

Ans. (a) Scales

6. Water vascular system is characteristic of.

(a) porifera
(b) Mollusca
(c) *Echinodermata*
(d) cnidaria

Ans. (c) *Echinodermata*

7. Which one of the following is not the exclusive trait of Arthropoda?

(a) presence of wings
(b) jointed appendages
(c) chitinous exoskeleton
(d) presence of haemocoel

Ans. (a) presence of wings

8. Pinus is a ---------- plant.

(a) bryophytic
(b) gymnospermous
(c) Pteridophytic
(d) angiosperms

Ans. (b) gymnospermous

9. Well defined nucleus is absent is –

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

Ans. (a) blue green algae

10. Which is the simplest of the following many – celled animals?

(a) sponge
(b) hydra
(c) starfish
(d) jellyfish

Ans. (a) sponge

11. Which one is not a flightless bird?

(a) Ostrich
(b) kiwi
(c) Penguin
(d) Dove

Ans. (d) Dove

12. Which phylum contains the greatest number of species of animals?

(a) sponges
(b) *molluscs*
(c) Arthropods
(d) Chordates.

Ans. (c) Arthropods

13. Pteridophyta do not have –

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

Ans. (c) flowers

14. Who is known as father of taxonomy?

(a) Linnaeus
(b) Darwin
(c) Mendel
(d) Watson

Ans. (a) Linnaeus

15. Presence of diaphragm is the characteristic feature of –

(a) amphibian
(b) reptile
(c) mammals
(d) Pisces.

Ans. (c) mammals

16. The branch of Biology dealing with classification is known as –

(a) Physiology
(b) taxonomy
(c) Paleontology
(d) mycology

Ans. (b) taxonomy

17. Which of the following characteristics does not apply to fungi?

(a) Non-green
(b) saprophytic or parasitic
(c) Autotrophic
(d) Heterotrophic

Ans. (c) Autotrophic

18. Which of the following is not a criterion for classification of living organisms?

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

Ans. (d) Height to the plant.

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2 Marks Questions

1. Why do we classify organisms?

Ans. A large number of organisms exist on this earth. We cannot study such enormous biodiversity one by one i.e. studying variety of life forms individually is an impossible task.

Hence, we make groups or categories of organisms depending upon their similarities and dissimilarities with other organisms. This allows an easier and systematic study of the life forms.

2. Give three examples of the range of variations that you see in life forms around you.

Ans. i) Life forms vary in their size – Some organisms are too small and cannot be seen with naked eyes like microorganisms while others are too big like the biggest animal which is the blue whale.

ii) Number and type of cells – Some organisms have a prokaryotic cell like bacteria and that single cell performs all the required functions while others have eukaryotic cells organized into tissue, organ and even organ systems like human beings.

iii) Mode of nutrition – Some organisms are autotrophic i.e. capable of making their own food eg plants while other organisms are heterotrophic i.e. they are dependent on other organisms for their food supply.

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

(a) the place where they live.

(b) the kind of cells they are made of. Why?

Ans. The classification of organisms based on the place where they live is not quite convincing because other living in the same habitat they hardly share any other feature for example whales, corals, starfishes, octopus, fishes, sharks etc all are aquatic i.e. they live in water their appearance and all other features are very different.

Therefore, classification of organisms based on the kind of cells they are made of is more widely accepted. For such categorization organisms belonging to prokaryotic group will have a particular cell structure and functional pattern which will be different from the eukaryotic group.

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

Ans. The primary characteristic on which the first division of organisms is made is the form and functions of that organism.

5. On what bases are plants and animals put into different categories?

Ans. On the basis of their mode of nutrition plants and animals are put into different categories.

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

Ans. Such organisms that possess quite simple structure and body design also haven't changed much from their ancient sort of details even after long period of evolution on earth are called as the primitive organisms like bacteria who are still single celled and prokaryotic while advanced organisms have complex body design like trees and humans.

7. Will advanced organisms be the same as complex organisms? Why?

Ans. Yes we can say that the advanced organisms are the same as complex organisms because advancement has occurred due to the process of evolution where a group of simple organisms have changed themselves into the complex forms of life for better survival.

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

Ans. The criterion used for classification of organisms as belonging to kingdom Monera or Protista is their cell structure.

Both Monerans as well as Protists are unicellular or single celled organisms but among monerans the cell is prokaryotic i.e. do not contain well defined nucleus while in protists the cell is eukaryotic i.e. have a well-defined nucleus.

9. In the hierarchy of classification, which grouping will have the smallest number of organisms with a maximum of characteristics in common and which will have the largest number of organisms?

Ans. Smallest number of organisms with a maximum of characteristics in common will be Species while grouping with largest number of organisms with common characteristics will be the Kingdom.

10. How are pteridophytes different from the phanerogams?

Ans. Pteridophytes do not produce seeds but develop naked embryos while phanerogams are seed producing plants like gymnosperms and angiosperms.

11. How do gymnosperms and angiosperms differ from each other?

Ans.

Gymnosperms	Angiosperms
They are plants producing male and female cones. They develop seeds but those seeds are naked i.e. fruits are not formed.	They are flowering plants hence produce flowers as reproductive organs. They develop seeds those are covered inside fruits i.e. fruit formation occurs.

12. How are the criteria for deciding divisions in plants different from the criteria for deciding the subgroups among animals?

Ans. Animals are classified into subgroups on the basis of their level of body organization (cellular, tissue, organ grade) and symmetry, body cavity and presence or absence of notochord etc.

13. Explain how animals in Vertebrata are classified into further subgroups.

Ans. Animals in Vertebrata are classified into further subgroups based on their development of nervous system, circulatory system, reproductive methods etc.

14. Name two egg laying mammals.

Ans. Mammals give birth to young one but some mammals lay eggs like – platypus and echidna

15. Mention the features of vertebrates

Ans. a) Presence of tubular, dorsal, hollow nerve cord.

b) Presence of a solid, rod – like structure called the notochord at some stage.

c) triploblastic and coelomate

d) Presence of post – anal tail (reduced or absent in many adult chordates)

16. Give the technical name of the following –

(a) pea

(b) potato

(c) tiger

(d) humans

Ans. a) *Pisum sativum*

b) *Solanum tuberosum*

c) Panthera tigris

d) Homo sapiens

17. How pteridophytes different from phanerogams?

Ans. Pteridophyta has hidden reproductive organs. External flower or seeds are absent. In phanerogams, well developed reproductive organs which produce seeds are present.

18. Define – sporophyte and gametophyte

Ans. sporophyte – It is the diploid (2n) phase or individuals in the life of an organism and produce spores.

Gametophyte – It is the haploid (n) phase or individuals in the life – cycle of an organism and produce gametes for sexual reproduction.

19. What is alternation of generation?

Ans. When sporophyte diploid (2n) phase alternates to gametophyte haploid (n) phase or vice versa. In order to complete life cycle, it is called alternation of generation. e.g Obelia and fern etc.

20. What is Binomial nomenclature? Who proposed it?

Ans. It is the naming system in which the name of the organism has two words first word is the name of 'genus' and second word is the name of 'species' of the organism. It was proposed by Carl Von Linnaeus.

21. State any two characteristic features of animals

Ans. Characteristics of animals –

a) Animals are multicellular organisms with heterotrophic mode of nutrition.

b) They have power of locomotion and possess nervous system.

22. Name the group of plants with the following characters:

a) Plants without root, stem, leaf and flowers.

b) Plants lacking chlorophyll.

Ans. (a) Thallophytic

(b) Fungi

23. Name the various units of classification.

Ans. Units of classification are – species, Genus family, order, class, Phylum (Division), Kingdom.

24. Why are bacteria and fungi classified along with plants?

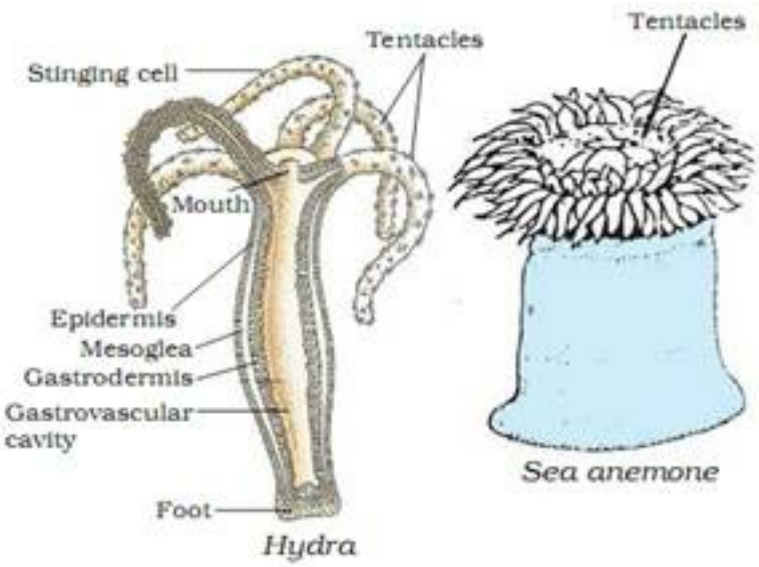
Ans. Bacteria are kept under plants because they are mostly non-green and they possess cell wall. Fungi is kept under plants because it do not move but it lacks chlorophyll and derive nutrition from dead organic matter or by other methods.

25. Give difference between bony and cartilaginous fishes.

Ans. In bony fishes skeleton is bony (made up of bones) while in cartilaginous fishes skeleton is made up of cartilage.

26. In what respects are lichens unusual plants?

Ans. A lichen is a close partnership between an alga and a fungus. The algal cells grow in the fungal mycelium. Alga make food by photosynthesis. The fungus provides shelter and protection to the alga. Thus, both the alga and the fungus benefit. This kind of association is called a symbiotic association.



27. Name two coelenterates with diagrams. How do poriferan animals differ from coelenterate animals?

Ans. Examples of coelenterates.

Poriferans are the simplest multicellular and branched. The cells are loosely held together and do not form tissue Coelenterates have one continuous central cavity called coelentron.

28. Differentiate between the heart of a fish and a birds?

Ans. Heart of fish is two chambered – auricle and ventricle whereas birds have four chambered heart.

29. What is the difference notochord and nerve card?

Ans. Notochord is a solid stiff but flexible rod like structure gives vertebral column in higher chordates (animals) while nerve cord is a solid or hollow tube like structure gives brain and spinal cord (nervous system)

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3 Marks Questions

1. How do poriferan animals differ from coelenterate animals?

Ans.

Poriferans	Coelenterates
They bear pores on their body.	Pores are absent on body.
They have cellular level of body organization.	They have tissue grade of body organization.
Mesoglea absent.	Mesoglea (body cavity) present.

2. How do annelid animals differ from arthropods?

Ans.

Annelids	Arthropods
Body cavity is true coelom.	Body cavity is haemocoel like in cockroach.
Body segmented and segments are called annuli.	Body segmented into head, mesothorax and metathorax.
Legs absent.	Three pairs of legs present.
Closed circulatory system.	Open circulatory system.

3. What are the differences between amphibians and reptiles?

Ans.

Amphibians	Reptiles
Body is soft and slimy without scales.	Body is covered with scales.
Fertilisation external and lay eggs in water.	Fertilization internal and lay eggs on land e.g. turtles.

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

Ans.

Aves	Mammalia
They lay eggs from which young ones hatch out.	They give birth to the young ones.
Body is covered with feathers.	Body is covered with hairs.
Bones are hollow or pneumatic.	Bones are filled with bone marrow.

5. What are the advantages of classifying organisms?

Ans. Because of the huge biodiversity i.e. variety of life forms existing on earth it becomes very difficult to study them individually so scientists have made groups of organisms based on their similarities and dissimilarities. Such catergorisation of organisms is known as classification which help us to study them easily and systematically.

6. How would you choose between two characteristics to be used for developing a hierarchy in classification?

Ans. We would choose the characteristic related to their structure and function that will help developing a hierarchy from one level to the next level. Like arthropods are organisms with jointed appendages but among arthropods insects and spiders make to separate groups having peculiar characteristics to define them. Hence we can make the hierarchy in classification by selecting general to specific characteristics.

7. Explain the basis for grouping organisms into five kingdoms.

Ans. The basis for grouping organisms into five kingdoms is as follows:
a) The organisms are made of prokaryotic or eukaryotic cells.
b) The organism has a single cell in its body or is a multicellular life form.
c) The organism prepares its own food or is dependent on other for food.

8. What are the major divisions in the Plantae? What is the basis for these divisions?

Ans.

Thallophyta	Bryophyta	Pteridophyta	Gymnosperms	Angiosperms
Plant body not differentiated into root, stem and leaf.	Develop root like structures called rhizoids but lack vascular tissues.	Develop vascular tissue for conduction but lack seeds.	Develop naked sees and lack flowers.	Develop seeds covered inside fruits and produce flowers.

9. What is the basis of grouping organisms into live kingdoms?

Ans. Basis for the classification of five kingdom classification –
a) Cell structure
b) Mode and source of nutrition
c) Body organization

10. Define – (a) bilateral symmetry

(b) coelom

(c) Triptoblastic

Ans. (a) Bilateral symmetry – Body can be divided into two similar halves only by one plane that passes through the central or median axis e.g. – tortoise, humans.
(b) Coelom – It is the body cavity which is lined externally as well as by regular layer of mesoderm
(c) Triploblastic – When the body of an animal develops form three germ layer – ectoderm, mesoderm and endoderm, are called triploblastic

11. Differentiate monocot and dicot plant.

Ans.

Character	Monocots (Monocotyledonae)	Dicots (Dicotyledonae)
1. seed – cotyledons	One	Two
2. seed – germination	Hypogeal	Epigeal or hypogeal
3. Root	Primary root short lived, adventitious fibrous root system present	Primary root present. (forming tap root system)
4. leaf	Isobilateral – Parallel venation.	Dorsiventral – Reticulate venation
5. stem – cambium	Absent	Present

12. Write characteristics of angiosperms.

Ans. Characteristics of angiosperms –

a) The angiosperms are the dominant group of land plants. These are the most common flowering plants.

b) The angiosperms are seed bearing plants and the seeds are enclosed inside the fruit formed from ovary.

c) Carpel is like of *megasporophyll* as gymnosperms, but it is differentiated ovary, style and stigma

d) The pollen grain is received by the stigma causing pollination.

e) Ovary develops into fruit and ovules into seeds after the act of fertilization.

13. Write the main characteristics of Mammalia.

Ans. Characteristics of mammalia are –

a) Mostly terrestrial but found in all types of habitats

b) Body is of varied shape divisible into head, neck, trunk and tail.

c) Skin covered with hair and has sweat glands

d) They possess mammary glands which produce milk to nourish the young ones

e) Respiratory organs are lungs only.

f) The heart is four – chambered

14. Describe the general characteristics of Gymnosperms

Ans. Characteristics of gymnosperms.

a) The stem is erect aerial branched or unbranched.

b) The leaves are usually dimorphic i.e., presence of two types of leaves on a plant.

c) These are naked seeded plants i.e., their ovules are not enclosed in the ovary.

d) The microsporophyll (male reproductive organ) and megasporphyll (female reproductive organ) are compactly arranged around the central axis forming male cone & female cone respectively.

15. What is classification? What is the need of classification? What is the basis of classification?

Ans. Classification – The process of grouping similar things into groups or categories on the basis of similarities and differences is called classification.

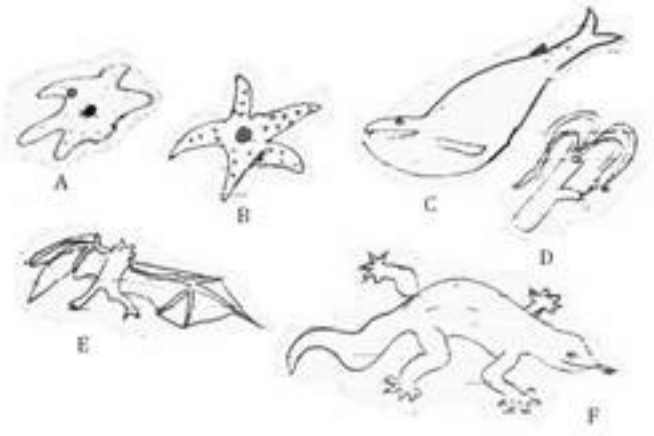
Need of classification – It is very difficult to study large number of organisms individually. So organism having similar characters grouped together and the studied easily.

Classification – Cell structure, mode & source for the nutrition and body organization.

16. Observe the figures given below and answer the following questions.

(a) which of the following animals are invertebrates underline them

(b) name the underlined animals



(c) give two important characteristics of underlined animals.

Ans. a) A, B, D

b) A – Amoeba, B – Starfish (asterias) D – Hydra.

c) i) Amoeba –
1. It is uninucleate
2.locomotion is by finger like pseudopodia

ii) Asterias (starfish) –
1. Body is radially symmetrical
2. Body cavity is modified into a water – vascular system with elastic tube – like out word extension for locomotion called tube – feet or podia.

iii) Hydra –
1. Mouth is surrounded by tentacles which helps in feeding
2. Respiratory, circulatory and excretory organs are absent.

17. Write characteristics of Aves.

Ans. Characteristics of aves are –
(i) Body is covered with feathers divided into head, neck and tail.
(ii) Birds are bipedal. The fore-limbs are modified into wings for flight.
(iii) Mouth is surrounded by a beak. Teeth are absent.
(iv) Skeleton is light because the long bones are hollow and contain air cavities.
(v) Respiration is by lungs which have air-sacs.
(vi) The heart is four – chambered.

18. You are given an assortment of plants on laboratory table. What characteristics will you look for in order to label a particular specimen as –

(a) Angiosperm (b) Moss (c) Algae (d) Fungi (e) Gymnosperm.

Ans. Angiosperm – Flowering plants
Moss - Leaves and roots are absent, presence of rhizoids.
Algae - Absence of stem, root and leaves, presence of pigments.
Fungi - Non-green, made up of hyphae
Gymnosperm – Naked – seeded plants, i.e, seeds are not enclosed within the fruit.

19. What are the major divisions of the kingdom planate? What is the basis of these

divisions?

Ans. Major division of kingdom plantae – thallophya, bryophyta, pteridophyta, gymnosperms and angiosperms. This kingdom includes Basis for classification –
(a) All organisms which are multicellular, eukaryotic and green autotrophs.
(b) Green plants are further classified on the basis of differentiation of the plant body.
(c) Second level of classification plant body has vascular tissue or not. Further classification is based on **(i)** whether seeds are present or not. **(ii)** Whether seeds are enclosed within fruit or not.

20. Write characteristics of kingdom Animalia.

Ans. Characteristics of kingdom animalia are
(a) Animals are multicellular, eukaryotic organisms
(b) Animal nutrition is heterotrophic. They lack photosynthetic pigments.
(c) Animal lack cell walls.
(d) Animals possess the power of locomotion
(e) Most Animals have a nervous system which is used to coordinate their body actions and response.
(f) In sexual reproduction, animals produce haploid male gametes (sperms) and female gametes.

21. Name the group of plants known as "Amphibians of plant world". Mention their three important characters.

Ans. Bryophytes are the plants which lives on land and in water so they are called amphibians of the plant kingdom. These plants shows following character -
(a) The plant body is either thallus – like (thalloid) or leaf like (foliose)
(b) True leaves and roots are lacking; the plants are anchored to the soil by means of filamentous rhizoids.
(c) Plant body is green and autotrophic
(d) The vascular tissue are absent.

22. Give three points of how birds have adapted themselves to an aerial mode of life.

Ans. Adaptations of birds to aerial mode of life.

(a) Their body is covered with feathers.

(b) Forelimbs are modified into wings

(c) They have hollow bones which helps them in flight.

23. Give difference between vertebrates and invertebrates.

Ans.

	Vertebrates	Invertebrates
a	Internal skeleton present	Internal skeleton absent.
b	Vertebral column (backbone) present	Vertebral column (backbone) absent
c	Two pairs of limbs present.	Three or more pairs of limbs if present
d	A tail is usually present.	A tail is absent
e	Body covered by hair	Hair are not present
f	Nerve cord is dorsally located.	Nerve cord is ventrally located.