

#### Grade IX

Lesson : 7 DIVERSITY IN LIVING ORGANISMS (CHAPTER AT A GLANCE)

















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#### NOMENCLATURE (OR SCIENTIFIC NAMING)

- Introduced by Carolus Linnaeus
- Scientific name is unique for an organism that can be identified anywhere in the world
- Scientific name (Genus + Species)
- Certain conventions for writing scientific name.
  - \_\_\_\_ When printed genus and species are give in italic
  - \_\_\_\_ When hand written, genus and species are underlined
  - \_\_\_\_ When Name of genus begins with a capital letter and the species name

begins with a small letter.

True Coelom : Completely derived from mesodermal cells.

Notochord : A rod-like cartilaginous structure that provides support to the body.



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Pigeon Aves (Birds)	Ju Ju	ouc	Mammalia cow
Objective Typ	e Questions		
	I. Multiple	choice questions	
1. A group of fresh int	erbreeding organism	s constitute a	
a) family	b) genus	c) species	d) class
2. Binomial system of n	omenclature means t	hat every organism	has :
a) a name given b	by two scientist		
b) One scientifi specific name.	c name consisting of	a generic name and	a specific name and a
c) One scientific	name and one popula	ar name	
d) a number in a	n international catalo	gue by which an org	ganism is identified
3. All the plants, animal	s and protists living	in a forest ma <mark>ke</mark> up	a
a) phylum	b) population	c) species	d) community
4. In Whittaker's class	fication, unice <mark>llul</mark> ar e	eukaryotic organism	s are grouped under
a) Protozoa	b) Porifera	c) Fungi	d) Protista
5. In a taxonomic hiera common characterist	rchy, as one goes fro ics.	m Species to Kingdo	om the number of
a) will increase		b) will decreas	se
c) may increase	or decrease	d) remains san	ne
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- 6. The correct order of the biological hierarchy from Kingdom to Species is
  - a) Kingdom, Phylum, Order, Family, Class, Genus, Species
  - b) Kingdom, Phylum, Class, Order, Family, Genus, Species
  - c) Kingdom, Class, Family, Order, Phylum, Genus, Species
  - d) Kingdom, Class, Order, Phylum, Family, Genus, Species
- 7. The scientific name of an organism
  - a) may refer to more than one species
  - b) may have more than one genus
  - c) varies according to the native language of scientists
  - d) is the same for scientists all over the world
- 8. The taxonomic unit 'Phylum' in the classification of animals is equivalent to which hierarchical level in classification of plants.

a) Class		b) Family	c	) Order		d) Divisio	n
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9. Members of which of the following kingdoms are single cells with considerable internal complexity?

a) Monera	b) Animalia	c) Planatae	d) Protista

- 10. The broadest category of organism in biological taxonomy is
  - a) Class b) Phylum c) Kingdom d) Family
- 11. Which is the biggest plant group in the Plant Kingdom?
  - a) Angiosperms b) Gymno<mark>sp</mark>erms c) Ferns d) Moss
- 12. A plant is diploid and well adapted to extreme conditions. They grow bearing sporophylls in compact structures called cones. Identify the group to which it belongs.
  - a) Pteridophyta b) Angios<mark>pe</mark>rms c) Gymnosperms d) Bryophyta.
- 13. Amoeba, Paramoecium are examples of organisms from which kingdom?

a) Fungi b) Monera c) Protista d) Plantae





- a) Prokaryotic, unicellular b) Prokaryotic, multicellular c) Eukaryotic, unicellular d) Eukaryotic, multicellular 15. Monocots and Dicots are the features of b) Gymnosperms a) Angiosperms c) Pteridophytes d) Bryophytes 16. Identify a member of Porifera [NCERT Exemplar Problem] a) Spongilla b) Euglena c) Penicillium D) Hydra 17. Amphibians do not have the following [NCERT Exemplar Problems] a) Three chambered heart b) Gills or lungs c) Scales d) Mucus glands 18. Organisms without nucleus and cell organelles [NCERT Exemplar Problems] a) Fungi b) Protista c) Cyanobacteria d) Archaebacteria 19. The feature that is not a characteristic of protochordata. b) Bilateral symmetry and coelom a) Presence of notochord c) Jointed legs d) Presence of circulatory system 20. The locomotory organs of Echinodermata are [NCERT Exemplar Problem] a) Tube feet b) muscular feet c) jointed legs d) parapodia 21. Corals are [NCERT Exemplar Problem] 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 22. Who introduced the system of scientific nomenclature of organisms? [NCERT Exemplar Problems] a) Robert Whittaker b) Carolus Linnaeus
  - c) Robert Hooke

14. Kingdom Fungi are

d) Ernst Haeckel





23.	3. Two chambered heart occurs in				[	[NCERT Exemplar Problems]					
	a) Croc	) Crocodiles b) Fish				c	c) Aves d) amphibians			S	
24.	Skeleton is made entirely of cartilage in					n [	[NCERT Exemplar Problems]				
	a) Shar	rks	b)	Tuna		c	) Rohu		d) N	lone of t	hese
25.	Real orgar	ns are ab	sent in				NCERT Exemplar Problems]				
	a) Moll	usca	b)	Coelente	erato	1 C	) Arthi	ropoda	d) E	chinoder	mata
26.	Hard calc	ium cart	onate st	ructure	s are	used a	is skele	ton [NC	ERT Exe	mplar Pro	oblems]
	a) Echi	noderma	ita b)	Protoch	orda	ta a	:) Arthi	ropoda	d) N	lematoda	
27.	Five king	dom class	sification	n was giv	en b	у [	NCERT	Exemple	ar Proble	ms]	< label{eq:started_startes
	a) Mor	gan	b)	R. Whit	take	r d	:) Linna	eus	d) H	laeckel	
	1. c	2. b	3.d	4. d	5.	b 6	b. b	7. d	8. d	9. a	10. c
	11. a	12. c	13. c	14. d	15	a 1	6. a	17. c	18. d	19. c	20. a
	21. d	22. b	23. b	24. a	25	.b 2	26. a	27. b			
28			I	Match	the	colum	ns				
-0.											
			Column				Colum	m TT			
		1 E				A Tuk	Colun				
		2 Kin	adom			R Sol	num				
		3 Sne	ries			C Plan	tae				
		4. Ger	nus			D. solo	inaceae				
	[	1. D	2.	С		3. A		4. B			
	I. FILL IN THE BLANKS					l					
29.	29. Birds and mammals are blooded.						~ ~				
30	30 is a part of embryo within the seed of a plant										





- 31. Gymnospermic plants bear \_\_\_\_\_\_ seeds
- 32. The largest phylum of animal kingdom is \_\_\_\_\_\_ system for water to flow through them.
- 33. Sponges have characteristic \_\_\_\_\_ system for water to flow through them.

29. warm	30. Cotyledon	31. naked	32. Arthropoda	33. canal		
	C.P			D P		
	NC	I. TRUE OR F	ALSE	]2		
34. Sexes are s	34. Sexes are separate in Echinoderms					
35. Nematodes	35. Nematodes are diploblastic					
36. Body cavity is absent in annelids						
37. Tentacles ai	re present in Hyd	dra				
34. True	35. False	36. False	37. True			

- Direction [Q.38 to Q.40] : In the following Questions, the Assertion and Reason have been put forward. Read the statements carefully and choose the correct alternative from the following.
  - a. Both the Assertion and the Reason are correct and the Reason is the correct explanation of the Assertion.
  - b. The Assertion and the Reason are correct but the Reason is not the correct explanation of the Assertions.
  - c. Assertion is true but the Reason is false.
  - d. The statement of the Assertion is false but the Reason is true.
- 38. Assertion: Bryophytes are also called the amphibians of the plant kingdom.

Reason: Bryophytes can grow in both soil and water

39. Assertion: Mosses prevent soil erosion

**Reason:** Mosses form dense mats on the soil which prevent the impact of the falling rains.





40. **Assertion:** Plants with will differentiated reproductive tissue that make seeds are called cryptogamae.

Reason: Angiosperms are divided into two groups, monocots and dicots

41. Name an organism which is called saprotrophs. Why that is called so? [CBSE 2014]

Fungi is a saprotroph. It is called saprotroph because it takes nutrients from dead and decaying matter.

42. Where are seeds of gymnosperms formed?

[CBSE 2015]

Seeds of gymnosperms are naked.

- 43. Rewrite the scientific names correctly: [CBSE 2012]
  - a) panthera tigris b) periplaneta Americana
  - a) Panthera tigris b) Periplaneta americana
- 44. Name the term which is used for the following [CBSE 2012]
  - a. The left and right halves of the body have the same design.
  - b. The animal tissue differentiate from the three embryonic germs layers.
  - a) Bilaterally symmetrical b) Triploblastic
- 45. Which in your opinion is more basic characteristic for classifying organism the place where they live in or the kind of cells they are made of? [CBSE 2012]

The kind of cells they are made of is more basic characteristic for classifying organism.

46. What is the role of "International Code of Binomial Nomenclature"?

It sets the rules and guidelines for the binomial nomenclature.

47. Name the group in which related genera are placed.

Family

48. Give the technical terms of naming animals and plants with two words. i.e., one generic and other specific.

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**Binomial Nomenclature** 





#### 49. State the phylum to which centipede and prawn belong [CBSE 2012]

Centipede and prawn belong to phylum Arthropoda.

#### 50. Name the phylum in which the animals have water vascular system

Echinodermata

#### 51. Name the seven basic hierarchical categories.

Kingdom, Phylum (animals) or Division (Plants), Class, Order, Family, Genus and Species.

#### 52. Define pseudocoel.

A false body cavity between body wall and gut, e.g., in roundworms

#### 53. What is tube-within-a tube plan?

When an animal has a complete gut and has mouth for intaking the food and anus for expelling of faces is called tube-within-a-tube plan.

#### 54. Which organisms are included in Kingdom Protista?

Unicellular eukaryotic organisms

#### 55. Give the habitat and economic importance of Taenia solium

Taenia solium is an endoparasite of intestine of man and causes taeniasis disease in man.

#### 56. To which division of Cryptogams do algae belong?

Thallophyta

#### 57. Write one specific feature of thallophyta plant.

The body of thallophyta plant is not differentiated into stem, root and leaves

#### 58. Which division of plants is called the amphibians of the plant kingdom?

Bryophyta

#### 59. Why is Euglena called plant-animal?

Euglena has certain plant characters like having chloroplasts and certain animal characters like having flagellum, eye-spot. Etc.,





#### 60. Why amphibians are always present close to the water bodies?

Most amphibians lay their eggs in water or in moist location on land so they are always present close to the water bodies.

61. Which is the largest phylum of animal kingdom?

Arthropoda

62. To which phylum do sponges belong?

Phylum - Porifera

63. The animals belonging to a phylum have segmented body. Name the phylum

Phylum - Annelida

64. What is the most important feature of Arthropoda?

Arthropods possess jointed legs.

#### 65. What are cyclostomata?

Cyclostomata are group of jawless fishes which have round mouth but lacks jaws. They belong to phylum chordate and sub-phylum agnatha

#### 66. Which organisms are included in Arthropods?

Prawn, all insects, spider, scorpion, crab, etc.

#### 67. Which type of animals are included in Mollusca?

Animals which possess soft body are included in Mollusca.

#### 68. Why is octopus so called?

Octopus possesses eight arms, that is why it is so called

#### 69. From where do the term echinoderms originate?

In Greek , Echino means spine<mark>s a</mark>nd Derma means s<mark>kin</mark>.

70. Why are mammals so called?

They posses mammary glands

- 71. Name one aquatic mammal and one egg-laying mammal.
  - Aquatic mammal Blue Whale

Egg laying mammal - Duck-billed Platypus







#### 72. In which groups are diploblastic animals found?

Sponges and coelenterates

#### 73. Which are the smallest and the largest birds?

Smallest bird - Humming bird

Larges bird - Ostrich

#### 74. Name two animals belonging to cyclostomata class

- a) Lamrey (Petromyzon)
- b) Hag fish (Myxine)

#### 75. How are oviparous and viviparous animals different from each other?

Oviparous animals lay eggs, e.g. birds while viviparous animals give birth to young ones, e.g. most of the mammals.

#### 76. What s metameric segmentation? Om which group of animals is it reported?

In metameric segmentation external body divisions corresponds with internal divisions of body cavity. It is found in annelids.

#### 77. What is haemocoel? Which groups of animals have haemocoel?

Haemocoel is a pseudocoel with blood. It is found in arthropods and molluscs.

#### 78. How does a male cockroach differ from a female cockroach?

A male cockroach has anal styles but no brood pouch while a female cockroach has brood pouch but no anal styles.

#### 79. In what way, are amphibians advanced than the fishes?

Amphibians have three-chambered heart and lungs fro respiration, while fishes have two-chambered heart and gills for respiration

#### 80. Why are bats not placed in birds?

Bats can fly like birds but like mammals they have hair, pinnae and mammary glands.

#### 81. Why are frogs not seen in the winter months?

Frogs are cold blooded animals and cannot tolerate low temperature of winter, so they hibernate in the winter months.





#### 82. List two differences between lizards and snakes

Lizards have limbs and eardrum while snakes do not.

#### 83. Give one difference between cartilaginous and bony fishes.

Cartilaginous fished have ventral mouth and uncovered fill slits while bon fishes have terminal mouth and opercualted gill slits.

#### 84. Name to fresh wear sponge and a coelenterate.

Spongilla, Hydra

#### 85. Name thephylum in which animals have tissues level organisation.

Coelentearte

#### 86. How did Carolus Linnaeus divide the living organisms?

Carolus Linnaeus studies the diversity of plants and animals and classified them as arrangement of plants and animals.

#### 87. What is the need of nomenclature?

Nomenclature is necessary for any species to make uniformity. In local language, particular species have different names so when it is given any scientific name, it is universally accepted.

#### 88. Differentiate between taxonomy and systematics.

Taxonomy is the process of identification, nomenclature and classification of organisms, whereas systematic is the practice of identification, nomenclature, classification and study of evolutionary relationship among organisms.

#### 89. Give the importance of taxonomy.

Importance of Taxonomy :

a) It makes the study of a wid<mark>e</mark> variety of organisms easier.

b) it is essential to understand the interrelationship among different groups of organisms.

## Next Generation School





#### 90. Differentiate between the Diploblastic and Triploblastic.

Diploblastic	Triploblastic		
It means two layers of cells in	It means three layers of cells		
the embryo, one makes up cells	in the embryo from which		
on the outside of the body and	differentiated tissues of the		
the other makes up inner lining	body of an organism are made.		
of the body.			

#### 91. Why bryophytes are called the amphibians of the plant kingdom?

Bryophytes are plants that live both on land as well as in water. They are therefore, called amphibians of plant kingdom.

Example : Moss and liverworts.

#### I. Short Answer Question

#### 92. Give one example of each :

- a) Asymmetry, radial and bilateral symmetry
- b) acoelomates, pseudocoelomate and haemocoelomate
- c) diploblastic and triploblastic animals
- a) Sycon, Asterias (Starfish) and Liverfluke.
- b) Acoelomates, pseudocoelomate and haemocoelomate.
- c) Hydra and Earthworm
- 93. Which phylum have the following characteristics?
  - a) Animals without tissues, body bearing pores.
  - b) Unsegmented soft-bodied having a calcareous shell, ventral foot and mantle.
  - c) Body segmented, jointed legs, compound eyes.

School c) Arthropoda a) Porifera b) Mollusca



94. Write appropriate terms for the following :

a) Animal that is able to maintain a certain body temperature over a wide range of temperature in the environment

b) Plants which bear naked seeds

c) Animals which have pseudocoelom

a) Endothermic b) Gymnosperm c) Pseudocoelomate

95. What is binomial nomenclature? Who proposed it? State the conventions followed

While writing the scientific name of organisms.

**Binomial nomenclature :** It is the system of nomenclature in which two terms are used to denote a species of living organisms. The first term indicates the genus and the 2<sup>nd</sup> term indicates species.

- 96. One day Disha who is studying in class IX went to mother dairy's vegetable shop where she found some umbrella like structure being sold. She could immediately identify them.
  - a) What is that structure?
  - b) To which kingdom does that belong?
  - c) Write two characteristic features of organisms belonging to this kingdom.
    - a) Agaricus Commonly known as mu<mark>shroom</mark>
    - b) It belongs to kingdom fungi
    - c) i) Fungi are eukaryotic non green organisms
      - ii) They are heterotrophic in nature.

97. Explain the meaning of the terms and give an example in each of the following :

a) Symbiotic relationship

b) Cotyle<mark>don</mark>s

c) Prokaryotic

a) Symbiotic relationship : It is the relationship where two organisms work together by helping one another with the intent of getting help in return. Example : Egrets and cattle: while the egrets get their food when they eat the insects from the skin of the cattle, the cattles get the benefit of a clean skin.

**b)** Cotyledons : Cotyledon is a part of the embryo within the seed of a plant. When the seed germinates, the cotyledons become the first leaves of the seedling. E.g. when gram seed





germinates the seed breaks into two parts which look like two leaves. These leaf like structes are called cotyledon.

c) Prokaryotic : Prokaryotic cells are those that do not have a membrane bound nucleus e.g. bacteria.

98. Give differences between monocotyledonous and dicotyledonous plants.

Monocotyledonous	Dicotyledonous
i) Monocot plants have seed with	i) Dicotyledon plant has seeds 🧷
single cotyledon	with two cotyle <mark>d</mark> on
ii) The plants have parallel	ii) The plants h <mark>ave</mark> reticulate
venation	venation
iii) The plant has fibrous root	iii) They have taproot system
system	

99. Disha saw a house lizard crawling on the wall and asked her mother who is a biology teacher .

a) Is body temperature related to surrounding temperature in reptiles? How can we define this feature of reptiles ?

b) What is their breathing organ?

c) Is there any reptile with four chambered heart? Summarize her mother's statement.

a) The body temperature of reptile is same as surrounding temperature. The feature in reptile is called cold blooded animal.

b) The breathing organ of reptile is lung.

c) Crocodile has four chambered heart.

Reptiles are cold blooded anim<mark>als and breathing of th</mark>ese take place through lungs. The lungs of reptiles are 3 chambered except crocodile which has a four chambered heart.

100. State a characteristic feature of thalophytes? Name two thalophytes which are predominantly acquatic.

Characteristic features of thallophyta are :

- i) They do not have well differed body design.
- ii) The plants in this group are commonly called algae.





iii) These plants are predominantly acquire

Two thallophytes which are predominantly aquatic are Spirogyra and Cladophora.

### 101. Why is there a need for systematic naming of living organisms? Write four conventions that are followed while writing scientific names of the species

There is a need for systematic naming of living organisms because of the following reasons.

In a community a local name serves the purpose or recognising an organism, but people in different regions call the same organism with different names.

For example, a dog is called kutta in Hindi, kukur in Bangla, naai in Tamil and kutra in Marathi and it is difficult to know different languages, Hence, a system of scientific naming was introduced by Carolus Linnaeus called as the Binomial system of Nomenclature

The four conventions that are followed while writing scientific names of the species are as follows:

a) The name of the genus begins with a capital letter.

b) The name of the species begins with a small letter.

c) When printed, the scientific name is given in italics.

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

#### 102. How does classification of organisms help us?

Classification of organisms helps us in the following ways:

a) It makes the study of a wide variety of organisms easy.

b) It puts all life forms at a gl<mark>an</mark>ce

c) It helps us to understand the inter-relationship among different groups of organisms

d) It helps in the development of other biological sciences.

# Next Generation School





#### 103. Draw labelled diagram of any three Protozoans.



104. Draw the phylogenetic tree to show the natural relationship among various animal phyla.



Phylogenetic tree indicating the relationship among various animal phyla

105. Describe the characteristics of the division Thallophyta .

The characteristic features of Thallophyta are :

- a) The plant body consists of an undivided thallus
- b) The sex organs are single-c<mark>el</mark>led
- c) After fertilisation, no embryo is formed

106. Describe the characteristic is of the division Bryophyta

The main characteristics of Bryophyta are :

- a) These are the simplest land plants.
- b) These have multicellular sex organs and an embryo formed after fertilisation
- c) The plant body of bryophyta is flat-leaves, roots and vascular system are absent





#### 107. Describe the characteristics of the division Pteridophyta.

The characteristic features of Pteridophyta are :

- a) They are the first vascular land plants and are also called vascular cryptogams
- b) Plant body of pterisophyta is made up of stems, leaves and roots.
- c) In pteridophyta, the reproductive organs are multicellular.
- d) They are autotrophs.

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

Both turtle and snake are placed in the same. Class reptile due to the following reasons :

- a) Both of them are cold blooded animals.
- b) Their body is covered with epidermal scales
- c) They respire through lungs only
- d) Both of them have three chambered heart
- e) Both of them lay eggs with thick covering

#### 109. Write the name used for the following:

- a) Plants which bear naked seeds
- b) Animals which have pseudocoelom.

c) Animals which maintain a certain body temperature over a wide range of temperature in the environment

- a) Gymnosperms bear baked seeds
- b) Animals under phylum nema<mark>to</mark>de have pseudocoelom

c) Aves and mammals maintain a certain body temperature over a wide range of temperature in the environment.

- 110. a) Identify the class of animals having the following characteristic features.
  - i) The warm blooded animals that lay eggs and have four chambered heart and a covering of feathers.
  - ii) The cold blooded animals having scales and they breath through lungs.
  - b) Give one example of an animal belonging to each of these classes :





a) i) Aves are warm blooded animals which lay eggs, have four chambered heart and a covering of feathers.

- ii) Reptiles are cold blooded animals having scales and breath through lungs.
- b) Example of Aves : Peacock

Example of reptile : Snake

- 111. a) Draw a neat diagram of a Hydra
  - b) Label mesoglea and gastrovascular cavity
  - c) Name the group of animals it belongs to
  - d) Name one species of this group which lives in colonies.



- b) See the diagram (a)
- c) IT belongs to Phylum Coelenterata
- d) Coral species of phylum Coele<mark>nt</mark>erata live in colonie<mark>s</mark>
- 112. a) List any two main characteristics of protochordates
  - b) In which class would you p<mark>lace any organism whic</mark>h has :
  - i) four chambered heart and lay eggs.
  - ii) Skeletons made of both bones and cartilage and are cold blooded.
  - a) Two main characteristics of chordate are :
  - i) They are exclusively marine, triploblastic and coelomate.





- ii) A long rod-like support structure called notochord is present at some stage of life. This structure runs along the back of the animal which separates the nervous tissue from gut.
- b) i) Vertebrate class, Aves lay eggs and have four chambered heart.

ii) Pisces are cold-blooded animals and their skeleton is made of both bones and cartilage.

#### 113. Give one point of difference between :

- a) Bony and cartilaginous fish b) Bilateral and radial symmetry
- c) Notochord and nerve cord

a) **Bony fish** have terminal mouth and operculated gill slits while cartilaginous fish have ventral mouth and uncovered gill slits.

b) In bilateral symmetry, body can be divided into two similar parts by only one plane along longitudinal axis of the body e.g. vertebrates.

In radial symmetry, body can be divided into two similar parts by any plane along oralaboral axis of body, e.g. coelenterates.

c) Notochord is the backbone and in some animals, it is replaced by a joint vertebral column. Serve cord is a collection of nerve fibres inside the vertebral column.

#### 114. Differentiate between a plant and an animal.

#### Differences :

Characteristics	Plants	Animals
a) Movability	Stationary	Move freely
b) Food habits	Plants prep <mark>are</mark> their own food	Animals cannot prepare
	from CO <sub>2</sub> a <mark>nd</mark> H <sup>2</sup> O in the presenc <mark>e</mark>	their own food. They eat
	of sunlight <mark>an</mark> d chlorophyll. Thus	plants or other animals
	plants are a <mark>ut</mark> otrophs	
c) Growth	Plants grow through their lives	Thus, animals are
		heterotrophs
d) Cell structure	A plant cell is surrounded by a cell	Animals grow up to a certain
Hex	wall and contains chloroplasts	age. Chool
		Animal cells neither have
		cell wall nor do they contain
		chloroplasts





#### 115. List some adaptations of reptiles towards terrestrial mode of life.

The adaptations of reptiles towards terrestrial mode of life. are :

a) Skin is thick, dry and non-glandular to check the loss of water.

b) Body is covered by an exoskeleton of epidermal scales which forms a water - proof coat

- c) Excretion is uricotelic which requires minimum water loss.
- d) Main mode of respiration is pulmonary respiration.
- e) Fertilisation is internal as male has copulatory organs.

f) Embryo is protected by embryonic membranes, so reptiles have become first true terrestrial vertebrates.

#### 116. List a few flight adaptation in birds.

The main flight adaptations in birds are :

- a) Forelimbs are modified into wings
- b) Body is covered by exoskeleton of feathers.
- c) Long bones are pneumatic, having air cavities
- d) Body is streamlined to reduce air resistance
- e) Well developed flight muscles
- f) Presence of air sacs helps in respiration
- g) Tail feathers form a steering apparatus.

#### 117. Give the main differences between Bryophyta and Pteridophyta

#### Differences :

Bryophyta	Pteridophyta			
a) The plant body is not differentiated into	a) The plan <mark>ts</mark> body is divided into true			
true roots, stems and leaves	roots, st <mark>e</mark> ms and leaves			
b) The main plant body is gametoph <mark>ytic</mark>	b) The main plant body is sporophytic			
c) Bryophytes are terrestrial, non-vascular	c) Pteridophytes are terrestrial, vascular			
plants	plants.			
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118. State any two characteristics of mammals. Name two egg laying mammals.

Two characteristics of mammals are

- a) They are warm-blooded animals
- b) Heart is four -chambered

Two egg laying mammals are platypus and echidna.

119. An animal is dorsoventrically flattened, has three embryonic germ layers and is accelomate. Which phylum does it belong to ? What are they commonly called as flatworms

The Animal belongs to phylum platyhelminthes. They are commonly called as flatworms. Example : Planaria

120. Complete





- 121. a. State two characteristics features of nematode
  - b. Identify the phylum with the help of followoing features:
  - i) Spiny skinned, radial symmetrical and have tube feet
  - ii) triploblastic, worm like having segmented body
    - a) i) The body is bilaterally symmetrical and triplblastic
      - ii) The body cavity is not a true coelom, it is called pseudocoelom
    - b) i) Echinodermata ii) Nematode

I. Long Answer Question

1. Draw a flow diagram to show the five kingdom classification







#### 2. Write the characteristic features of Kingdom Monera

The characteristic features of Kingdom Monera :

a) These organisms are prokaryotic, i.e. they do not have a well – defined nucleus and lack cellorganelles.

b) Some of the organisms have cell wall like bacteria and blue-green algae), while others lack cell wall (mycoplasma)

c) Mode of nutrition is either autrotrophic ( as in blue-green algae and some bacteria) or heterotrophic ( mycoplasma and most bacteria.

Examples : Bacteria, blue-green algae or cyanobacteria and mycoplasma

#### 3. Give five kingdoms of life in a tabular form mentioning their features with examples

Other Complexity Cell Mode of Ecological Kingdom of characteristics complexity Nutrition role Organisms and examples 1. Monera Unicellular Locomotion by Prokaryotic Heterotropoh Decomposer flagella e.g. or Autotroph Bacteria 2. Protista Eukaryotic Unicellular Heterotrop or Consumer Intracellular Autotroph movement e.g. amoeba 3. Fungi Eukaryotic Multicellular Saprophypte Decomposer Cell wall made of or Parasite chitin e.g. Yeast 4. Plantae Eukaryotic Multicellular Autotroph Producer Tissue differentiation well developed e.g. ferns Cell wall absent, 5. Animalia Eukaryoti Multicellular Heterotroph Consumer e.g. Sponges

Five kingdoms of life as proposed by whittaker (1959)







- 4. Draw a flow chart to show different divisions of kingdom planate and answer the following:
  - a) Which division has the simplest plants?
  - b) To which division Pinus and Cycas belong?
  - c) What is the other name given to flowering plants? Classify them on the basis of number of cotyledons present in the seed.



- a) Thallophyta has the simplest plants
- b) Both Pinus and Cycas belong to Gymnosperms





c) Flowering plants are called Angiosperms. Depending on the number of cotyledons present in the seed, they are divided into monocotyledonous and dicotyledonous. Monocotyledonous plant has single 'seed leaf' or cotyledon and dicotyledonous plant has two 'seed leaves' or cotyledons

- 5. a) To which divisions of plantae do algae belong? Write one characteristic of the division. Give two examples
  - b) Name the group :
  - i) Which includes unicellular eukaryotic organism.
  - ii) In which mode of nutrition is saprophytic
  - iii) In which seeds are not closed in fruit.

a) Algae belong to the division Thallophyta. One characteristic of Thallophyta is that the plants are predominantly aquatic. Example : Spirogyra and Cladophora.

- b) i) Protista ii) Fungi iii) Gymnosperm
- 6. With the help of diagram. Give the difference between dicotyledons and monocotyledons

Differences :

Plant Parts	Dicotyledons	Monocotyledons
Seed/Embryo	Embryo with two cotyledons	Embryo with single cotyledo
Root	Prominent primary root	Fibrous root
Leaf	Reticulate venation	Parallel venation
Flower	SE .	Trimerous





- 7. a) What is the scientific name of humans?
  - b) To which class of vertebrates does it belong?

c) Write five characteristic features of this group. Also mention the exceptions, if any.

- a) Homo sapiens
- b) Human belongs to the class mammalian of vertebrates.

c) Five characteristic features of class mammalian are :

- i) They are warm-blooded animals
- ii) They have four chambered heart
- iii) They have mammary glands for production of milk to nourish their young ones.
- iv) The skin of mammals have hair as well as sweat and oil glands.
- v) They give birth to young ones.

The exceptions to the above characteristics of mammal are platypus and echidna who lay eggs.

8. Name the six classes of vertebrates. Compare any two on the basis of their :

a) Habitat

b) covering of skin

c) Respiratory organs

d) Chambers of heart

e) Reproduction

The six classes of vertebrates are : Cyclostomata, Pisces, Aves and Mammalia. Comparison of Pisces and Aves.

Pisces	Aves
a) They are exclusively water living	a) They live on land
animals	
b) The body is covered with scales	b) The body is covered with a feathery
c) Their respiration is through gills	exoskeleton c) Their respiration is through lungs
d) The heart is two chambered	d) The heart is four chambered
e) They lay eggs	e) They also lay eggs.





- 9. a) Write four important feature that all chordates possess (vertebrates)
  - b) Write one characteristic each of amphibia and aves.
  - c) Write the name of the class to which following belong:
  - i) sea horse ii) king cobra
  - a) The four important features that all chordates possess are as follows:
  - i) They have a notochord and a dorsal nerve cord
  - ii) They are triploblastic
  - iii) They have paired gill pouches
  - iv) They are coelomate
  - b) One characteristic each of

Amphibia - They have mucus glands in the skin and three - chambered heart.

Aves: - They have an outside covering of feather and two forelimbs are modified for flight. They have a four - chambered heart.

- c) The class to which the following belong:
- i) Sea horse Pisces
- ii) King cobra Reptilia
- 10. You must have observed the following animals in your surrounding environment or in a Zoo. Mention the class to which they belong and give one characteristic feature of each. Frog, fish, lizard, pigeon, bat

Animals	Class	Characteristic feature		
a) Frog	Amphibia	- They have mucus glands in the skin without scales		
b) Fish	Pisces	- The body is cover <mark>ed</mark> with scales.		
c) Lizard	Reptilia	-Two pairs of penta <mark>da</mark> ctyl limbs are present		
d) Pigeon	Aves	- Body is covered with a feathery exoskeleton		
e) Bat	Mammalia	- Their skin has hair as well as sweat and oil glands.		
Mart Generation School				





#### 11. Write the characteristics of Phylum Porifera

The characteristics of Phylum Porifera:

- a) They are the simplest multicellular animals
- b) They are mostly marine but a few live in fresh water
- c) Sense organs are absent
- d) They reproduce as xually by budding, fragmentation and sexually through fertilization

e) The body is highly perforated with pores (ostia) and a single large opening called osculum on the top.

f) The skeleton consists of calcareous or siliceous spicules or sponging fibres.

- g) No mouth or anus
- h) Sponges have characteristic canal system for water to flow through them
- i) The body is vase-like rounded or sac-like

Examples are Sycon, Spongilla (fresh water sponges).

#### 12. Write the characteristics of phylum Coelenterata.

The characteristic features of Phylum Coelenterates :

- a) They are aquatic, may be fresh water or marine, solitary or colonial forms
- b) They are radially symmetrical
- c) Tentacles are present
- d) They have both extracellular and intracellular digestion
- e) Gastro vascular cavity of coelenterons is present as the centre of the body
- f) These organisms show two morphological forms, i.e. Polyps and Medusa
- g) They reproduce a sexually in polyp form and sexually in medusa form
- h) Some forms possess hard exoskeleton of lime to form corals.

Examples are Hydra, Obelia, Aurelia, Jelly - fish Corals, etc.





#### 13. Write the characteristic features of phylum Platyhelminthes

The main characteristics of Phylum Platyhelminthes

- a) These organisms are mostly parasitic but some are free living
- b) The body is dorsoventrally flattened and bilaterally symmetrical
- c) They possess three germ layers, i.e. triploblastic
- d) They are mostly hermaphrodite
- e) They can regenerate from a small body part

Examples are Fasciola (liver fluke), Schistosoma (blood fluke) and Taenia solium (tape worm)

#### 14. Write the characteristic features of phylum Nematoda.

The main characteristics of Phylum Nematoda:

- a) They are parasitic or free living
- b) Body size varies from microscopic to several centimeters in length
- c) Body is unsegmented and bilaterally symmetrical.
- d) They are triploblastic
- e) Alimentary canal complete but no circulatory and respiratory systems.
- f) Sexes are separate

Examples are Ascaris (roundworm), Wuchereria (filarial worm)

#### 15. Write the characteristic features of phylum Annelida

The characteristic features of Phylum Annelida

- a) Long, segmented, bilaterally symmetrical body covered by a thin cuticle
- b) They live in moist soil, fresh water and sea.
- c) Body is red due to the presence of haemoglobin
- d) Locomotory organs chitinous setae and parapodia are present
- e) Body is red due to the presence of haemoglobin
- f) Excretory and nervous systems are present.
- g) Sexes may be separate or united (hermaphrodite)

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Examples are Pheretima (earthworm), Hirudinaria (cattle leech), Aphrodite (sea mouse)

#### 16. Write the characteristic features of phylum Arthropoda:

The characteristic features of Phylum Arthropoda

a) It is the largest phylum of the animal kingdom having bilaterally symmetrical body structure.

- b) They are found in all types of habitat, viz. land, soil and water
- c) They possess jointed legs.
- d) The body is divided into three regions- head thorax and abdomen
- e) Mature body has blood -filled cavity or haemocoel. Blood is white in colour.
- f) The head bears sensory organs and brain
- g) The exoskeleton is made up of chitin
- h) Respiration is by gills, trachea or book lungs
- i) They have compound eyes and mosaic vision.
- j) Sexes are separate

Examples are Periplaneta (cockroach), Anopheles (mosquito), Palaemon (prawn)

#### 17. Write the characteristic features of Phylum Mollusca.

The characteristic features of Phyl<mark>um Mollus</mark>ca:

a) They have soft, unsegmented body and body is divisible into three regions – head, visceral mass and ventral foot

- b) Outer surface is covered with hard calcareous shell
- c) Sexes are separate
- d) Respiration occurs by gills called ctenidia
- e) They may be terrestrial or aquatic

Examples are Pila (snail), Unio (fresh water mussel), Octopus.





#### 18. Write the characteristics of class Echinodermata.

The characteristics features of class Echinodermata.:

a) They are marine, having bilateral symmetry in larval forms and radial symmetry in adults.

- b) The body shape may be star-lie, spherical or elongated
- c) The body is unsegmented and its surface is covered by calcareous spicules.
- d) Locomotion is by means of tube-feet
- e) Brain absent but nervous system present
- f) Respiration through tube-feet and gills
- g) Sexes are separate
- h) Body cavity is modified into water vascular system

Examples are Asterias (Star fish), Echinus (sea urchin), Holothuria (sea cucumber)

#### 19. Give the comparative summary of the vertebrate classes

Characteristics	Cyclostomata	Pisces	Amphibians	Reptiles	Aves	Mammals
a) Habitat	Aquatic	Aquatic	Terrestrial	Terrest	Arboreal	Terrestrial,
			and aquatic	rial		Aquatic and
			both			Arboreal
b) Exoskeleton	Soft, smooth	Slimy,	Slimy, non-	Dry,	Feathers	Hair are
	slimy and	scaly	scaly	scaly	are	present
	scale less				present	
c) Heart	Two	Two	Three	Three	Four	Four
	chambers	chambe	chambers	chambe	chamber	chambers
		rs		rs	S	
d) Respiratory	Gills present	Gills	Gills, lungs	Lungs	Lungs	Lungs
organ	in sac-like		and skin			
	pouches of					
	pharynx					
e) Locomotory	Fins	Fins	Limbs	Limbs	Wings	Limbs
organ						
f) Production	Oviparous	Oviparo	Oviparous	Oviparo	Oviparou	Viviparous
of off springs		us		us	S	
	ON A		0 / / / / /		lich	

Comparative summary of the vertebrate classes





20. Give the scientific names of the following:

	a) Liver fluke	b) Tape worn	n c) Cattle leech	d) Cockroach
	e) Housefly	f) Starfish	g) Indian Shark	i) Frog
	j) Flying Lizard	$(\mathbf{Q})$		
	a) Fasciola hepatica	. 31	b) Taenia solium	
	c) Hirudinaria granu	lose	d) Periplaneta Americana	
	e) Musca domestica		f) rubens	
	g) Scoliodon laticauc	dus	h) Anabas testudineus	
	i) Rana tigrina		j) Draco	
21. G	ive five examples of	mammals with	ner their scientific names.	
	a) Kangaroo	-	Macropus rufus	
	b) Rhesus monkey		Macaca mulatta	
	c) Elephant	•	Elephas maximus	
	d) Tiger		Panthera tigris	
	e) Man	-	Homo sapiens	

#### NCERT EXEMPLER

I. Short answer questions

#### 1. Write true (T) or false (F):

- a) Whittaker proposed five kingdom classification
- b) Monera is divided into Archaebacteria and Eubacteria
- c) Starting from Class, Species comes before the Genuus
- d) Anabaena belongs to the kingdom Monera
- e) Blue-green algae belongs to the kingdom Monera
- f) All prokaryotes are classified under Monera.
- a) T b) T c) F d) T
- e)F f) T





- 2. Fill in the blanks :
  - a) Fungi shows \_\_\_\_\_ mode of nutrition
  - b) Cell wall of fungi is made up of \_\_\_\_\_.
  - c) Association between blue-green algae and fungi is called as \_\_\_\_\_.
  - d) Chemical nature of chitin is \_
  - e) \_\_\_\_\_ has smallest number of organisms with maximum number of similar characters
  - f) Plants without well differentiated stem, root and leaf are kept in
  - g) \_\_\_\_\_ are called as amphibians of the plant kingdom.

f) thallophyta

- a) Saprophytic b) chitin c) lichen d) carbohydrate
- e) species

g) Bryophytes

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

Monocot	Dicot	
Wheat	Gram	
Rice	Pumpkin	
Maize	Pea	

4. Match items of column (A) with items of column (B)





5. Match items of column (A) with items of column (B)

Column (A)	Column (B)	
a) Pore bearing animals	A) Arthropoda	
b) Diploblastic	B) Coelenterata	
c) Metameric segmentation	C) Porifera	
d) jointed legs	D) Echinodermata	
e) Soft bodied animals	E) Mollusca	
f) Spiny skinned animals	F) Anneldia	
a) $\rightarrow C$ b) $\rightarrow B$	c) $\rightarrow$ F	
d) $\longrightarrow$ A e) $\longrightarrow$ E	$f \rightarrow D$	

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

Spongeilla	Sea anemone	
Planaria	Liver fluke	
Wuchereria	Ascaris,	
Nereis	Earthworm	
Scorpion	Birds	
Fishes	Horse	
Acoelomate	Pseudocoelomate	Coelomate

Acoelomate	Pseudocoelomate	Coelomate	
Spongilla Sea anemone Planaria Liver fluke	Wuchereria Ascaris,	Nereis Earthworm Scorpion Birds	
		Fishes and Horse	

# Next Generation School





7. 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.	$\sim$
Cartilagenous		Bony	0
Torpedo	Rohu		C
Sting ray,	Exoco	oetus.	
Dog fish			
Angler fish			

8. Classify the following based on number of chambers in their heart

Rohu, Scoliodon, Frog, Salamander, Flying lizard, King cobra, Crocodile, Ostrich, Pigeon, Bat, Whale

Rohu, Scoliodon	-	2- Chambered
Frog, Salamander, Flying lizard, Ki	ng cobra -	3- Chambered
Crocodile, Ostrich, Pigeon, Bat, W	hale -	4- Chambered

9. Classify Rohu, Scoliodon, Frog, Salamander, Flying lizard, King cobra, Crocodile, Ostrich, Pigeon, Bat and Whale into the cold blooded / warm blooded animals.

Cold blooded animals - Rohu, Scoliodon, Frog, Salamander, Flying lizard, King cobra, Crocodile,

Warm blooded animals

Ostrich, Pigeon, Bat , Whale

- 10. Name two egg laying mammals
  - a) Duck-billed Platypus
  - b) Echidna Seneration School





11. Fill in the blanks :

- a) Five kingdom classification of living organisms is given by \_\_\_\_\_
- b) Basic smallest until 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) Robert Whittaker
  - c) Monera
  - e) Chlorophyll
  - g) Yeast

h) Lichens

f) Mushroom

b) Species

d) Eukaryotic , unicellular, organisms

- 12. 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
    - a) False b) True c) False d) True e) True f) True





- 13. 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.
  - d) \_\_\_\_\_ are known to have pseudocoelom
    - a) Liver fluke b) Filarial worm (Wuchereria)
      - c) Arthropods e) Nematodes (Roundworms)
- 14. Label a, b, c and d given in figure. Give the function of b.



Function of Caudal fin - It helps in streamlined movement in water.







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





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#### I. Long answer questions

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

Ulothrix, Spirogyra, Cladophora and Chara are the examples of Thallophyta



17. Thallophyta, bryophyte and pteridophyta are called as 'Cryptogams'. Gymnosperms and Angiosperms are called as 'phanerogams'. Discuss why? Draw one example of Gymnosperm.

The Thallophyta bryophyte and pteridophyta are called as 'Cryptogams' because the reproductive organs of these groups are inconspicuous or hidden and do not bear flowers or seeds. Gymnosperms and Angiosperms are called as 'phanerogams' as they have conspicuous reproductive organs with seeds containing an embryo with stored food, which serves for the initial growth of the embryo during germination.





#### 18. Define the terms and give one example of each

#### a) Bilateral symmetry b) Coelom c) Triploblastic

a) Bilateral symmetry is a type of symmetry in which appendages and organs of the body are paired in which the left and right halves of the body have the same design, e.g. liver fluke

b) Coelom is mesoderm lined fluid filled internal body cavity between visceral organs and body wall in which well developed organs can be accommodated e.g. butterfly.

c) Triploblastic are animals having three layers of cells from which differentiated tissues can be made, e.g. star fish.

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

All organisms given in the question do not belong to same group. Leech and Nereis belong to Phylum Annelida because they have metamerically segmented body i.e. body is divided into many segments internally by septa, closed circulatory system and unjointed appendages. Body segments are lined up one after the other from head to tail. But Scolopendra, Prawn and Scorpion belong to appendages and open circulatory system.

## 20. Which organism is more complex and evolved among Bacteria, Mushroom and Mango tree? Give reasons

Mango tree because it has :

- a) Vascular tissues
- c) embryo stage

b) differentiated sporophyte

d) seeds present inside fruit

But bacteria are prokaryotic, Mushroom is eukaryotic but without any differentiation of root, stem and leaves absence of vascular tissue and embryo stage.

energion





#### 21. Differentiate between flying lizard and bird, Draw the diagram

#### Differences :



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

Bat, rate and cat belong to Class Mammalia and have following common features:

- a) Mammary glands are present
- b) External pinnae are present
- c) Viviparous animals
- d) Notochord present at some stage of life cycle
- e) Warm- blooded animal
- f) Four-chambered heart is present
- g) Skin covered with hair and with sweat and oil glands
- h) All the tree mammals produce live young ones







## 23. Why do we keep both snake and turtle in the same class?We keep both snake and turtle in the same class because both are :

a) cold - blooded

b) have scales

d) have three chambered heart

- c) breathe through lungs
- e) lay eggs with tough covering

Vext Generation School

