

## **Diversity in Living Organism**

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### **Improve your learning**

#### **Q. 1. Variations in organisms lead to diversity in living organisms? State reasons (AS1)**

**Answer :** Yes variation in organisms lead to diversity in living organisms. For example, white peppered moth was originally white in color with light spots, to blend with soft white colored trees, later during industrial revolution, pollution increased, leading to variation in moth to become more prevalent over the course of around 50 years. Therefore, the population of black moth increased and white when down. This shows that variation caused a new diversity in moth. Thus, variation occurs in organisms due to various reasons like environmental factors, climate, survivalist etc. Variation thus caused leads to diversity in living beings.

#### **Q. 2. What was the basis of early classifications? (AS11)**

**Answer :** The basis of early classification was:

- i. Living things are classified on the basis of their body structures.
- ii. Living things are classified on the basis of dissimilarities and similarities.
- iii. Charaka and sushruta had classified on the basis of their medical importance.
- iv. Parashar classified plant basing on the structure of flowers.
- v. Aristotle classified animals according to whether they lived on land, in water, or in the air.

#### **Q. 3. What are the advantages of classifying organisms? (AS1)**

**Answer :** The advantages of classifying organisms are as follows:

- i. It provides better knowledge and a better understanding of organisms are studied
- ii. It helps to study the organisms in a proper and systematic manner.
- iii. It helps to make a comparison in an easier way.
- iv. It helps in understanding the relationship between the organisms and their interdependence.
- v. Classification makes our study more focused and helps us to handle a huge population of organisms.
- vi. It also gives us the idea of evolution.

#### **Q. 4. What is the need for classification? What questions will you ask for this? (AS 2)**

**Answer :** Classification makes our study more focused and helps us understand evolution.

The questions to be asked about classification are as follows:

- i. What is meant by classification?
- ii. What is the need for classification?
- iii. Why do we have to classify the organisms?
- iv. How do we classify the organisms?
- v. What are the uses of classification?

**Q. 5. How do monocots differ from dicots? (AS1)**

**Answer :**

The differences between monocots and dicots are:

<b>Monocots</b>	<b>Dicots</b>
<ul style="list-style-type: none"><li>• These are monocotyledonous or have one cotyledon.</li><li>• The flower of the monocots has three petals or petals in multiples of three.</li><li>• Has a scattered arrangement of vascular bundles in the stem.</li><li>• New roots arise adventitiously from nodes in the stem.</li><li>• Have parallel arrangement of major leaf veins. Most of the times they have long and narrow leaves.</li><li>• For example grass, corn, rice, wheat, bamboo, etc.</li></ul>	<ul style="list-style-type: none"><li>• These are dicotyledonous thus have two cotyledons.</li><li>• The flower of the dicots has four or five petals or in multiples of four or five.</li><li>• The Arrangement of vascular bundles in the stem is in concentric circles.</li><li>• The roots develop from the radical, which is a part of the seed embryo.</li><li>• Have reticulate arrangement of major leaf veins, or in a net pattern. Have variety when it comes to shape and size of leaves.</li><li>• For example tomato, potato, beans, peas, etc.</li></ul>

**Q. 6. One day Kavita soaked seeds of green grams, wheat, maize, peas, and tamarind.**

**After they became tender, she tried to split the seed. Name which would split, which would**

**not and identify them according to the characters. (AS 4)**

S. No.	Name of the seed	Split into half (y)/does not split (N)	Monocot (M)	Dicot (D)
1.				
2.				
3.				
4.				

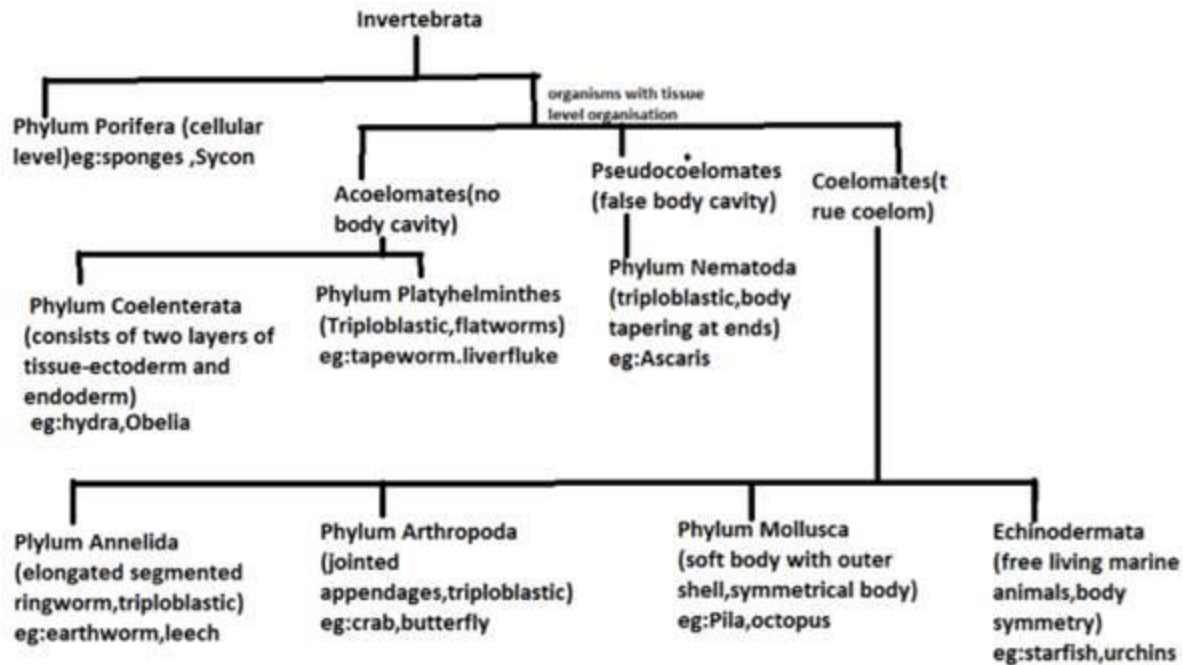
**Answer :**

The identified types of seeds and its types are as follows:

S. No.	Name of the seed	Split into half (y)/does not split (N)	Monocot (M)	Dicot (D)
1.	Grams	Y		D
2.	Wheat	Y	M	
3.	Maize	Y	M	
4.	Pea	Y		D
5.	tamarind	N	M	

**Q. 7. Make a flow chart of invertebrates in the kingdom Animalia, based upon their characteristic features. (AS 5)**

**Answer :** The flow chart of invertebrates in the kingdom Animalia, based upon their characteristic features is as follows:



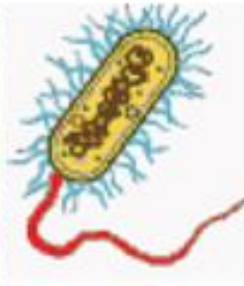
**Q. 8. Write some common characters of Pisces, Reptilia, and Aves. (AS 1)**

**Answer :** The common characters of Pisces, Reptilia, and Aves are as follows:

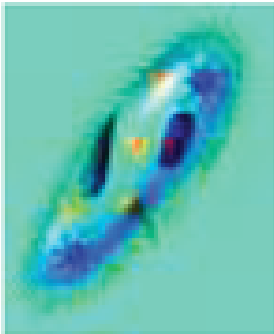
- i. All are tetrapod's.
- ii. All lay eggs.
- iii. All are cold blooded.
- iv. Excretory organs are kidneys.
- v. All have a notochord.

**Q. 9. Name the kingdom to which these organisms belong according to Whittaker.(AS1)**





**Answer :** According to Whittaker these organisms belong to the groups are as follows:



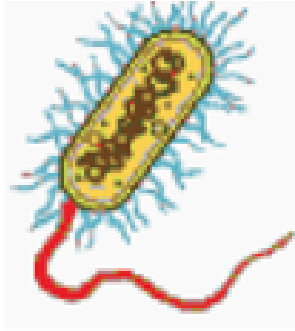
Protista



Animalia



Fungi



Monera

**Q. 10. Explain how animals in vertebrate are classified into further subgroups.(AS1)**

**Answer :** Vertebrata is divided into five groups:

- i. Aves – birds
- ii. Pisces – fishes
- iii. Mammals – humans
- iv. Reptilia – reptiles
- v. Amphibia – amphibians

Aves: They have an exoskeleton of feathers, four-chambered heart, hollow bones, the flight is possible, warm-blooded and lay eggs.

Pisces: They have an exoskeleton of scales, aerodynamic body structure, cold-blooded to change the body temperature according to the water temp, have gills for the respiration of dissolved oxygen and lay eggs.

Mammals: They have hairs as the exoskeleton, four-chambered heart, warm-blooded and gave birth to young ones.

Reptiles: They have scales on the body, cold-blooded, crawl for locomotion, have commonly three-chambered heart except crocodile and lay eggs.

Amphibia: They can survive on both land and water, have both lungs and gills depending on the life stage, have an exoskeleton of mucus, three-chambered heart and lay eggs.

**Q. 11. Platypus or Echidna is a group that forms a link between reptiles and mammals.**

**Think and write about some characteristic features that these would have. (AS 4)**

**Answer :** Platypus also known as the Duck Billed Platypus is a mammal that lay eggs. It has a bill like a bird and can deliver venom like a reptile. The genetic analysis revealed that the platypus has milk protein genes similar to other mammals that produce milk for their offspring even though it lays eggs.

Echidnas, sometimes known as the ‘Spiny Anteaters’ are also egg-laying mammals. The diet of some species consists of ants and termites. They evolved around 20 to 50 million years ago and they have both the properties of mammals and reptiles, like Platypus.

**Q. 12. Sujata says Bat is not a bird but a mammal. How can you support Sujata’s statement?**

**Answer :** Yes. Bats are not birds but mammals. Bats are commonly called flying mammals that belong to the taxonomic order Chiroptera. There are over 1200 species of bats that are known to scientists. They are present on every continent except for Antarctica.

Bats are mammals because they give birth to young ones and nurse them and have hair. This is why bats are classified into the taxonomic order Mammalia. While it is true that bats can fly, they are not closely related to birds, at all. In fact, a bat is more closely related to a mammal than it is to a bird.

**Q. 13. A. Which phylum do I belong to (AS1)**

**My body is made of pores. I live in water. I do not have back bone also .....**

**Answer :** My body is made of pores. I live in water. I do not have back bone also. Sponges

Explanation: The body of a sponge is covered by a layer of the exoskeleton and is covered in pores. They do not have a backbone and lives in water. They belong to the phylum Porifera.

**Q. 13. B. Which phylum do I belong to (AS1)**

**I am an insect. I have jointed legs. ....**

**Answer :** I am an insect. I have jointed legs. Arthropoda

Explanation: Arthropoda is the largest group of animals who are bilaterally symmetrical and segmented. Thus they have jointed legs. For example cockroaches, prawns, etc.

**Q. 13. C. Which phylum do I belong to (AS1)**

**I am a marine living animal with spiny skin. My body is radially symmetrical.....**

**Answer :** I am a marine living animal with spiny skin. My body is radially symmetrical.

### Echinodermata

Explanation: In Greek, echinos means hedgehog, and derma means skin. Thus, these are spiny skinned organisms. These are exclusively free-living marine animals. They have hard calcium carbonate structures that they use as a skeleton, for example, starfish and sea urchins.

**Q. 14. How can you appreciate the effort of scientists in classifying a wide range of organisms? (AS6)**

**Answer :** Classification of organisms makes our study more focused as

- i. It helps us to understand evolution
- ii. It helps us to handle a huge population of organisms
- iii. It helps us to know more about different organisms

All this could be done by classification itself hence; I appreciate the efforts of scientists in classifying a wide range of organisms.