

# SAMPLE CONTENT



Challenger

NEET - UG

# BIOLOGY Vol - I

For all Medical Entrance Examinations held across India.

**3562 MCQs with Hints**

## ***Asterias*** (Starfish)

Kingdom : Animalia

Phylum : Echinodermata

Members of phylum Echinodermata (spiny skinned animals) are characterized by endoskeleton of calcareous ossicles.



**Target** Publications® Pvt. Ltd.

For all Medical Entrance Examinations held across India.

# Challenger

## NEET – UG

# Biology

### Vol. I

#### Salient Features

- ☞ Exhaustive coverage of MCQs under each sub-topic.
- ☞ '3562' MCQs including questions from various competitive exams.
- ☞ Includes solved MCQs upto NEET-UG 2018, MHT-CET and various entrance examinations from year 2015 to 2018.
- ☞ Includes NEET-UG 2019 and NEET 2019 (Odisha) Question Paper and Answer Key along with Hints.
- ☞ Concise theory for every topic.
- ☞ Hints provided wherever deemed necessary.
- ☞ Model Test papers for thorough revision and practice.
- ☞ Important inclusions: Problems to Ponder.

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## PREFACE

Target's '**Challenger Biology: Vol-I**' is a compact guidebook, extremely handy for preparation of NEET-UG exam.

Features of each chapter:

- **Theoretical Concepts** presented in the form of pointers, tables, charts and diagrams that form a vital part of any competitive examination.
- **Multiple Choice Questions** segregated into two sections. **Concept Building Problems** – Contains questions of various difficulty range and pattern. **Practice Problems** – Contains ample questions for thorough revision.
- **Problems to Ponder:** MCQs of different pattern created with the primary objective of helping students to understand the application of various concepts of Biology.

Two **Model Test Papers** are included to assess the level of preparation of the student on a competitive level.

MCQs have been created and compiled with the following objective in mind – to help students solve complex problems which require strenuous effort and understanding of multiple-concepts. The MCQs are a mix of questions based on higher order thinking, theory, and multiple concepts.

The level of difficulty of the questions is at par with that of various competitive examinations like AIIMS, CPMT, TS EAMCET (Med. and Engg.), BCECE, AP EAMCET (Med. and Engg.) and the likes. Also to keep students updated, questions from most recent examinations such as AIPMT/NEET, MHT-CET, K CET, GUJ CET, WB JEEM of years 2015, 2016, 2017 and 2018 are covered exclusively.

NEET-UG 2019 and NEET 2019 (Odisha) Question Paper and Answer Key has been provided. Students can access the hints of this Question Paper given in the form of QR Code.

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*A book affects eternity; one can never tell where its influence stops.*

From,  
Publisher

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## Frequently Asked Questions

### ➤ **Why Challenger Series?**

Gradually, every year the nature of competitive entrance exams is inching towards conceptual understanding of topics. Moreover, it is time to bid adieu to the stereotypical approach of solving a problem using a single conventional method.

To be able to successfully crack the NEET and JEE (Main) examination, it is imperative to develop skills such as data interpretation, appropriate time management, knowing various methods to solve a problem, etc. With Challenger Series, we are sure, you'd develop all the aforementioned skills and take a more holistic approach towards problem solving. The way you'd tackle advanced level MCQs with the help of hints, tips, shortcuts and necessary practice would be a game changer in your preparation for the competitive entrance examinations.

### ➤ **What is the intention behind the launch of Challenger Series?**

The sole objective behind the introduction of Challenger Series is to severely test the student's preparedness to take competitive entrance examinations. With an eclectic range of critical and advanced level MCQs, we intend to test a student's MCQ solving skills within a stipulated time period.

### ➤ **What do I gain out of Challenger Series?**

After using Challenger Series, students would be able to:

- assimilate the given data and apply relevant concepts with utmost ease.
- tackle MCQs of different pattern such as match the columns, diagram based questions, multiple concepts and assertion-reason efficiently.
- garner the much needed confidence to appear for various competitive exams.

### ➤ **Can the Questions presented in Problems to Ponder section be a part of the NEET/JEE (Main) Examination?**

No, the questions would not appear as it is in the NEET/JEE (Main) Examination. However, there are fair chances that these questions could be covered in parts or with a novel question construction.

### ➤ **Why is then Problems to Ponder a part of this book?**

The whole idea behind introducing Problems to Ponder was to cover an entire concept in one question. With this approach, students would get **more variety and less repetition** in the book.

*Best of luck to all the aspirants!*

# 02 Biological Classification

- 2.0 Introduction
- 2.1 Kingdom Monera
- 2.2 Kingdom Protista
- 2.3 Kingdom Fungi

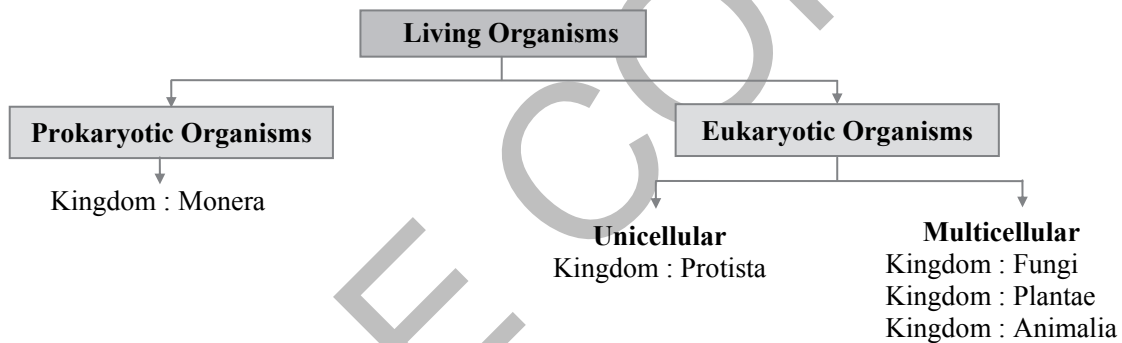
- 2.4 Kingdom Plantae
- 2.5 Kingdom Animalia
- 2.6 Viruses, Viroids and Lichens

## 2.0 Introduction

- **Linnaeus (1758):** All the organisms were divided into two kingdoms.



- **R. H. Whittaker (1969):** Classified organisms based on cell structure, thallus organisation, mode of nutrition, reproduction and phylogenetic relationship.



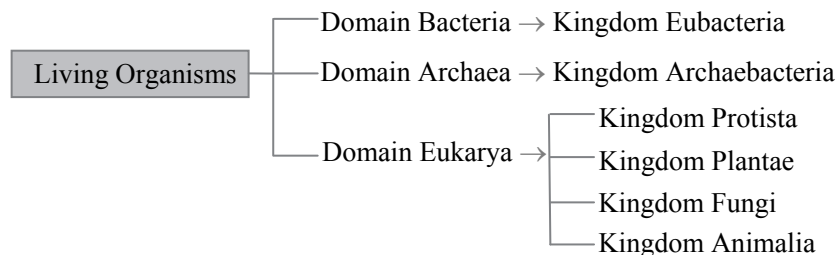
### Characteristics of the Five Kingdoms

Features	Five Kingdoms				
	Monera	Protista	Fungi	Plantae	Animalia
<b>Cell type</b>	Prokaryotic	Eukaryotic	Eukaryotic	Eukaryotic	Eukaryotic
<b>Cell wall</b>	Noncellulosic (Polysaccharide + amino acid)	Present (in some)	Present (Non cellulosic)	Present (cellulose)	Absent
<b>Nuclear membrane</b>	Absent	Present	Present	Present	Present
<b>Body Organisation</b>	Cellular	Cellular	Multicellular/ loose tissue	Tissue/organ	Tissue/organ/ organ system
<b>Mode of nutrition</b>	Autotrophic (chemosynthetic and photosynthetic) and heterotrophic (saprophytic / parasitic)	Autotrophic (Photosynthetic) and heterotrophic	Heterotrophic (Saprophytic/ parasitic)	Autotrophic (Photosynthetic)	Heterotrophic (Holozoic/ saprophytic)

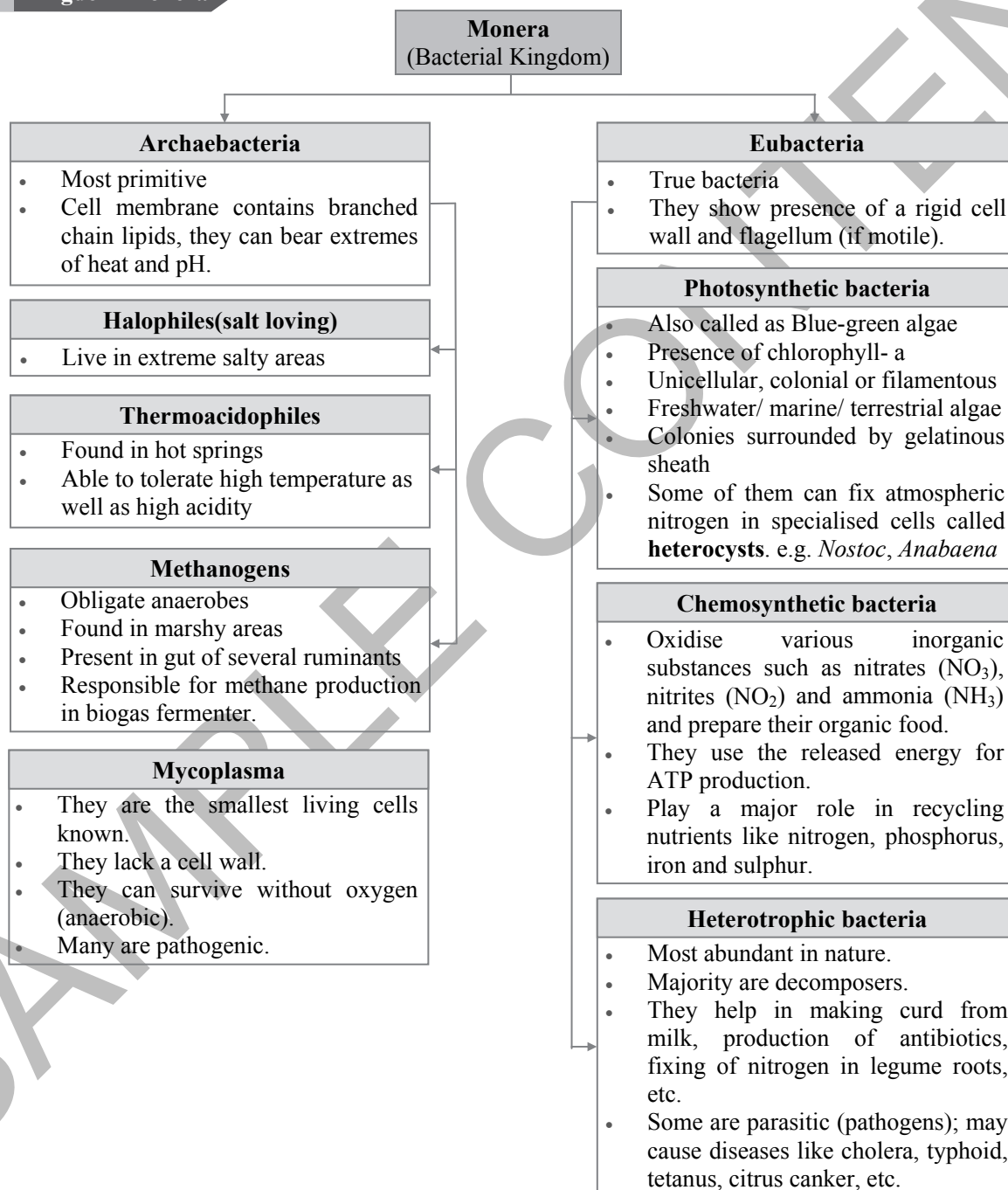
- **Three domain of life:**  
This system was proposed by Carl Woese in 1990.  
This system divides Kingdom Monera into two domains and the eukaryotic kingdoms remain in the third domain.



Thus, it makes six kingdom classification.



## 2.1 Kingdom Monera



## 2.2 Kingdom Protista

- i. Mostly aquatic, include single celled eukaryotes.
- ii. Well defined nucleus and other membrane-bound organelles, some have flagella or cilia.



iii. Classification of Kingdom Protista:

Features	Chrysophytes	Dinoflagellates	Euglenoids	Slime Moulds	Protozoans
<b>Found in</b>	Fresh water, marine environment	Mostly marine (few occur in fresh water)	Fresh water (stagnant water)	Damp, shady places	➤ Heterotrophs, live as predators or parasites.
<b>Mode of Nutrition</b>	Photosynthetic	Photosynthetic	Photosynthetic and heterotrophic in presence and absence of sunlight respectively (mixotrophic nutrition).	Heterotrophic-saprophytic	➤ <b>Four major groups of protozoans:</b> <b>i. Amoeboid Protozoans:</b> a. Live in fresh water, sea water, moist soil. b. Move and capture their prey by using pseudopodia (false feet) eg: <i>Amoeba</i> , <i>Entamoeba</i> etc. <b>ii. Flagellated Protozoans:</b> a. Free living or parasitic b. They possess flagella c. Cause diseases such as sleeping sickness eg: <i>Trypanosoma</i>
<b>Cell wall/membrane</b>	Most of them do not possess cell wall, except for few such as diatoms. They have siliceous shell or frustules (made up of silica, cellulose and pectic compounds), thus do not decay easily. Cell wall consists of two overlapping halves fitted together like a soap box.	Cell wall has stiff cellulose plates on the outer surface.	Proteinaceous, flexible layer called <b>pellicle</b> is present instead of a cell wall.	Thallus is without cell wall but spores have true walls.	<b>iii. Ciliated Protozoans:</b> a. Aquatic b. Presence of many cilia for movement. c. They have a cavity (gullet) that opens to the outside of the cell surface. d. They show coordinated movement of cilia, which helps in the movement of water and food to be transported into the gullet. eg: <i>Paramecium</i>
<b>Flagella</b>	Lack flagella	Two flagellae: One lies longitudinally and other transversely in a furrow between the wall plates, aids in locomotion	Two flagellae: long and short	The spores germinate to produce swarm cells which are biflagellate.	
<b>Examples</b>	Diatoms and golden algae (desmids)	<i>Gonyaulax</i> (red dinoflagellate)	<i>Euglena</i>	<i>Physarum</i>	
<b>Other features</b>	<ul style="list-style-type: none"> <li>• Due to deposition and accumulation of cell walls of diatoms over billions of years, 'diatomaceous earth' is formed.</li> <li>• Diatomaceous earth is gritty and hence can</li> </ul>	<ul style="list-style-type: none"> <li>• Appear yellow-green, brown, blue or red (depending on the pigments)</li> <li>• Red dinoflagellates undergo rapid multiplication and make sea appear red</li> </ul>	<ul style="list-style-type: none"> <li>• Pigments are identical to that of the higher plants.</li> </ul>	<ul style="list-style-type: none"> <li>• Saprophytic protists</li> <li>• Under suitable condition form an aggregation called plasmodium. Under unfavourable conditions, plasmodium</li> </ul>	



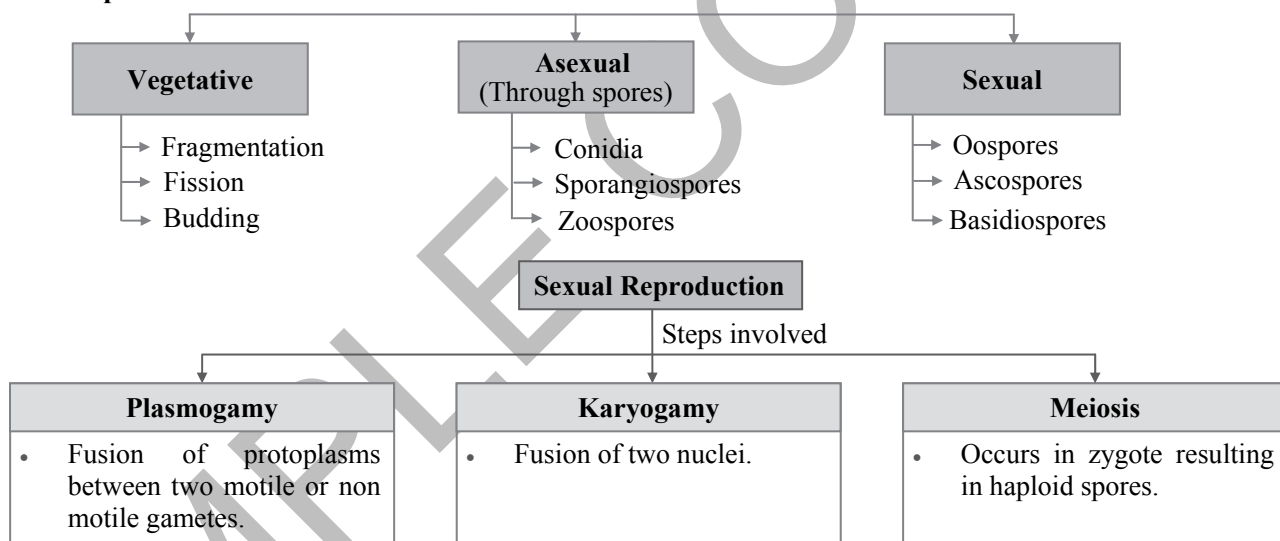


	be used in polishing, filtration of oils and syrups. <ul style="list-style-type: none"> <li>Diatoms are the chief producers in the oceans.</li> </ul>	(red tides) <ul style="list-style-type: none"> <li>Releases toxins (can kill many fishes)</li> </ul> <i>Note:</i> Some dinoflagellates like <i>Noctiluca</i> show bioluminescence, (i.e. they emit light)		differentiate to form fruiting bodies which bear spores at their tips. <ul style="list-style-type: none"> <li>Extremely resistant and can survive for many years under adverse conditions.</li> </ul>	<b>iv. Sporozoans</b> <ol style="list-style-type: none"> <li>They show infectious spore like stage. eg: <i>Plasmodium</i> (malarial parasite).</li> </ol>
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### 2.3 Kingdom Fungi

- Eukaryotic, heterotrophic organisms.
- Filamentous (except Yeasts: unicellular).
- Cell walls are composed of chitin and polysaccharides.
- Fungi are multicellular decomposers.
  - Saprophytes:** absorb soluble organic matter from dead substrates for nutrition.
  - Parasites:** depend on living plants and animals.
  - They can also live as **symbionts** in association with algae (**Lichens**) and with roots of higher plants (**Mycorrhiza**).

v. **Reproduction:**



- Fungi are classified on the basis of morphology of the mycelium, mode of spore formation and fruiting bodies.
- Classification of Fungi:**

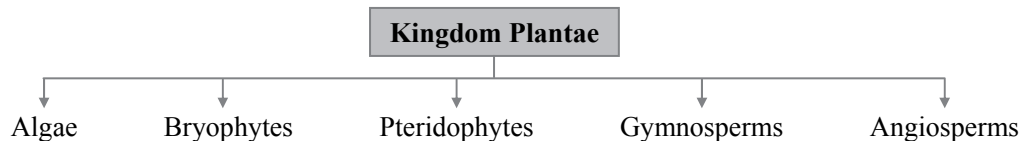
Features	Phycomycetes	Ascomycetes	Basidiomycetes	Deuteromycetes
<b>Common name</b>	Algal fungi	Sac fungi	Club fungi	Imperfect fungi
<b>Mycelium</b> (Network of hyphae – long, slender, thread like structure)	Aseptate, coenocytic (Hyphae are continuous tubes filled with multinucleated cytoplasm)	Septate (hyphae with septae or cross walls), branched	Septate, branched; secondary mycelium is dikaryotic	Septate, branched
<b>Asexual reproduction</b>	Motile zoospores, non motile aplanospores produced endogenously in sporangium	Conidia produced exogenously on condiophores. They are also called as thallic spores.	Generally not found	Conidia



<b>Sexual reproduction</b>	Zygospor e formation occurs due to isogamy (similar gametes fuse) or anisogamy (dissimilar gametes fuse) or oogamy (small flagellated male gamete and non-flagellated female gamete fuse)	Ascospores are produced in sac like asci (sing. ascus) endogenously.	Plasmogamy occurs → fusion of two vegetative cells → give rise to basidium → karyogamy and meiosis occurs in basidium to produce four basidiospores.	Either absent or not known
<b>Fruiting body</b>	Produces zygospores	Ascocarp	Basidiocarp	Absent
<b>Examples</b>	<i>Mucor, Rhizopus, Albugo</i>	<i>Penicillium</i> (used for preparation of antibiotics), Yeast, <i>Aspergillus, Claviceps, Neurospora</i> (used in biochemical and genetic work); Morels and Truffles (edible)	<i>Agaricus</i> (mushroom) <i>Ustilago</i> (smut), <i>Puccinia</i> (rust fungus)	<i>Alternaria, Trichoderma, Colletotrichum</i>
<b>Other features</b>	These are found: <ul style="list-style-type: none"> <li>• in aquatic habitats</li> <li>• on decaying wood in moist and damp places</li> <li>• as obligate parasites on plants.</li> </ul>	<ul style="list-style-type: none"> <li>• Multicellular</li> <li>• Saprophytic</li> <li>• Decomposers</li> <li>• Parasitic or coprophilous (growing on dung)</li> </ul>	<ul style="list-style-type: none"> <li>• Commonly known forms of basidiomycetes are mushrooms, bracket fungi or puffballs.</li> <li>• Grow in soil, on rotten wood, etc.</li> <li>• Sometimes they may act as parasites when they are in living plant bodies. e.g. rusts and smuts.</li> </ul>	<ul style="list-style-type: none"> <li>• Most of them are decomposers.</li> <li>• They help in recycling of minerals.</li> </ul>

## 2.4 Kingdom Plantae

- i. Plants are eukaryotic, chlorophyll containing organisms. (A few members are partially heterotrophic, e.g. Bladderwort and Venus fly trap are insectivorous plants, *Cuscuta* is a parasite.)
- ii. Cells have chloroplasts and cell wall made up of cellulose.
- iii. Life cycle of plants has 2 phases: the diploid **sporophytic** and haploid **gametophytic** phase. They alternate their phases with each other. This phenomenon is called **alternation of generation**.



## 2.5 Kingdom Animalia

- i. They are heterotrophic, eukaryotic organisms.
- ii. They are multicellular and lack cell walls.



- iii. They directly or indirectly depend on plants for food.
- iv. They digest their food in an internal cavity and store food reserves as glycogen or fat.
- v. Mode of nutrition: holozoic (by ingestion of food)
- vi. Sexual reproduction: copulation of male and female followed by embryological development.
- vii. Higher forms show elaborate sensory and neuromotor mechanism.
- viii. Most of them are capable of locomotion.

## 2.6 Viruses, Viroids and Lichens

### i. Viruses:

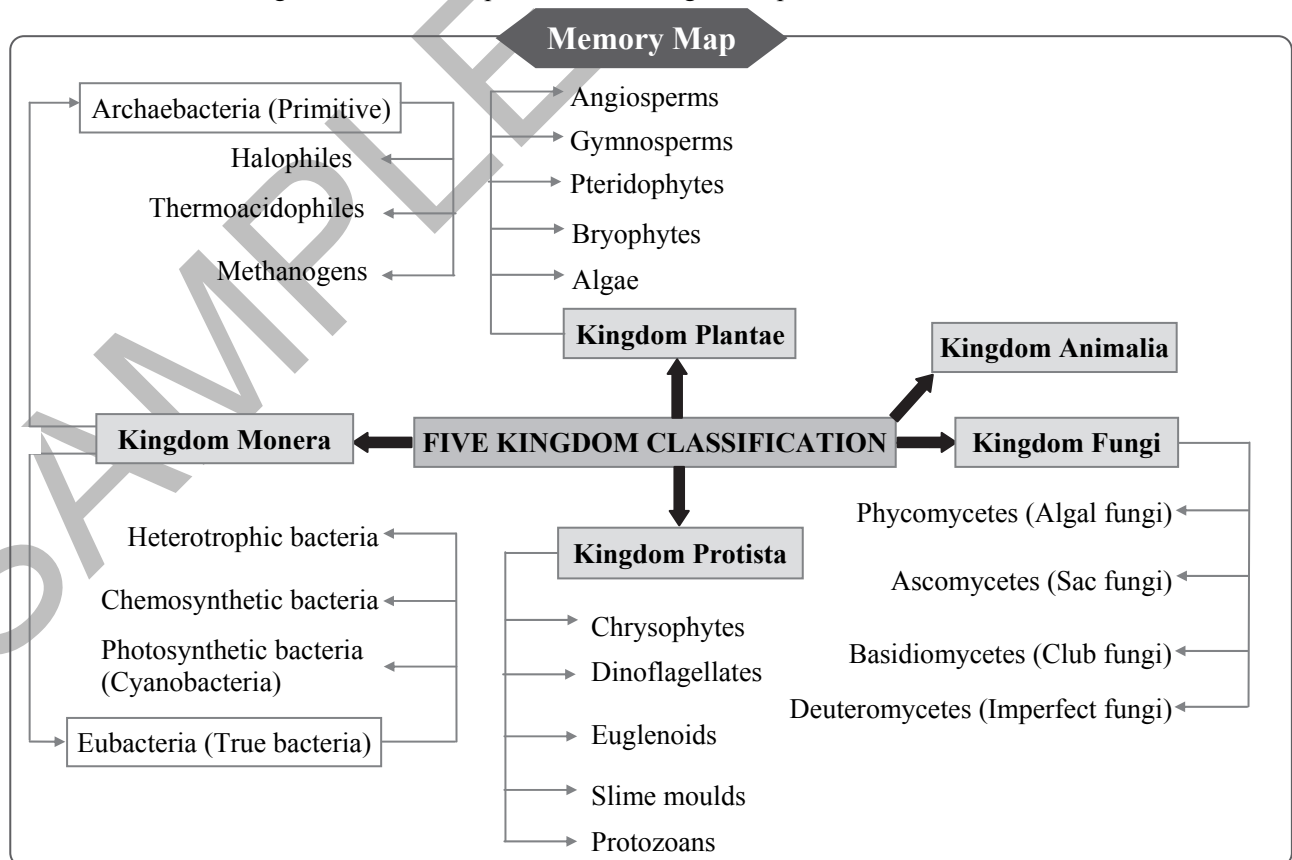
- a. Non cellular.
- b. They have an inert crystalline structure outside the living cell (host).
- c. They are obligate parasites.
- d. They infect host cell and take over its machinery and replicate inside the host.
- e. Genetic material is either DNA or RNA. No virus contains DNA and RNA both.
- f. Viruses that infect plants have single stranded RNA and viruses that infect animals have either ssRNA, dsRNA or dsDNA.
- g. **Capsid** is the protein coat and is made up of **capsomers** (small protein units) protecting nucleic acid. Hence, viruses are known as nucleocapsid.
- h. Viruses that infect bacteria are known as Bacteriophages which contain dsDNA.
- i. Viruses cause diseases like mumps, small pox, herpes, polio and influenza. AIDS in humans is caused by Human Immuno Virus or HIV.
- j. In plants, mosaic formation, leaf rolling and curling, yellowing of vein, dwarfing and stunted growth are symptoms of viral disease.

### ii. Viroids:

- a. Smaller than viruses.
- b. Potato spindle tuber disease is caused by potato spindle-luber viroid (PSTV).
- c. RNA is single stranded, lacks protein coat and of low molecular weight.

### iii. Lichens:

- a. Symbiotic associations between algae and fungi.
- b. Algal component phycobiont is autotrophic whereas fungal component mycobiont is heterotrophic.
- c. Lichens are good indicators of pollution. Do not grow in polluted area.





## Concept Building Problems

### 2.0 Introduction

1. Complete the following table and opt for the appropriate answer.

Features	Five Kingdoms				
	Plantae	Protista	Monera	Animalia	Fungi
Cell type	Eukaryotic	Eukaryotic	(i)	Eukaryotic	Eukaryotic
Cell wall	(iii)	Present in some	(ii)	Absent	Present (without cellulose)
Nuclear membrane	Present	Present	Absent	Present	(iv)

- (A) (i) Eukaryotic      (ii) Present (Non cellulosic)      (iii) Present      (iv) Absent  
 (B) (i) Eukaryotic      (ii) Present (Cellulosic)      (iii) Absent      (iv) Present  
 (C) (i) Prokaryotic      (ii) Present (Cellulosic)      (iii) Absent      (iv) Present  
 (D) (i) Prokaryotic      (ii) Present (Non cellulosic)      (iii) Present      (iv) Present

2. The drawbacks or limitations of two kingdom classification is/are

- (A) photosynthetic and non-photosynthetic organisms are placed together  
 (B) that it cannot distinguish between unicellular and multicellular organisms  
 (C) that it cannot distinguish between eukaryotes and prokaryotes  
 (D) all of the above

3. Phylogenetic system of classification is based on

- (A) floral characters  
 (B) morphological features  
 (C) chemical constituents  
 (D) evolutionary relationships

4. Before the Five Kingdom Classification was proposed by R.H. Whittaker, under which Kingdom were bacteria placed?

- (A) Monera      (B) Animalia  
 (C) Plantae      (D) Protista

5. According to five kingdom classification, Protista comprises

- (A) both unicellular and multicellular eukaryotes  
 (B) all prokaryotes  
 (C) all unicellular eukaryotes  
 (D) both prokaryotes and eukaryotes

6. Which of the following in five kingdom classification system does not include eukaryotes?

- (A) Plantae      (B) Fungi  
 (C) Monera      (D) Protista

### 2.1 Kingdom Monera

7. Which of the following are the sole members of Kingdom Monera?

- (A) Algae      (B) Bacteria  
 (C) Fungi      (D) Dinoflagellates

8. Match the columns and select the correct option.

	Column I		Column II
i.	Coccus	a.	Comma shaped
ii.	<i>Bacillus</i>	b.	Sphere shaped
iii.	<i>Vibrio</i>	c.	Rod shaped
iv.	<i>Spirillum</i>	d.	Spiral shaped

- (A) i - b, ii - d, iii - c, iv - a  
 (B) i - d, ii - c, iii - b, iv - a  
 (C) i - b, ii - c, iii - a, iv - d  
 (D) i - d, ii - b, iii - c, iv - a

9. The motile eubacteria exhibit motility by means of

- (A) fimbriae      (B) flagella  
 (C) cilia      (D) pili

10. Which of the following are found in extreme saline conditions? [NEET (UG) 2017]

- (A) Archaeobacteria      (B) Eubacteria  
 (C) Cyanobacteria      (D) Mycobacteria

11. Match Column I (Types of Archaeobacteria) and Column II (Habitat) and select the correct option.

	Column I (Types of Archaeobacteria)		Column II (Habitat)
i.	Methanogens	a.	Hot springs
ii.	Halophiles	b.	Marshy areas
iii.	Thermoacidophiles	c.	Salty areas

- (A) i - a, ii - c, iii - b  
 (B) i - b, ii - c, iii - a  
 (C) i - c, ii - b, iii - a  
 (D) i - c, ii - a, iii - b

12. Which of the following statement is INCORRECT?

- (A) Archaeobacteria differs from other bacteria in having different cell wall structure.  
 (B) Methanogens are found in the gut of many ruminant animals.  
 (C) Hot springs are the habitat of halophiles.  
 (D) Bacteria can be autotrophic as well as heterotrophic.



13. Archaeobacteria can live in some of the most harsh habitats such as  
(A) marshy areas (B) hot springs  
(C) extreme salty areas (D) all the above
14. The primitive prokaryotes responsible for the production of biogas from the dung of ruminant animals, include the [NEET P-I 2016]  
(A) Methanogens  
(B) Eubacteria  
(C) Halophiles  
(D) Thermoacidophiles
15. The guts of cows and buffaloes possess [AIPMT 2015]  
(A) *Chlorella* spp. (B) Methanogens  
(C) Cyanobacteria (D) *Fucus* spp.
16. Cyanobacteria can fix atmospheric nitrogen in  
(A) mucilageous sheath  
(B) heterocysts  
(C) pellicle  
(D) plasmodium
17. Identify the organism which forms blooms in polluted water bodies.  
(A) Cyanobacteria (B) *Euglena*  
(C) Diatoms (D) Desmids
18. **Assertion:** *Nostoc* is a photosynthetic autotroph.  
**Reason:** *Nostoc* can fix atmospheric nitrogen in heterocysts.  
(A) Both assertion and reason are true and reason is the correct explanation of assertion.  
(B) Both assertion and reason are true but reason is not the correct explanation of assertion.  
(C) Assertion is true but reason is false.  
(D) Both assertion and reason are false.
19. Heterocysts are found in  
(A) *Anabaena* and *Nostoc*  
(B) *Mucor* and *Chlorella*  
(C) *Euglena* and *Paramecium*  
(D) Lichens and *Agaricus*
20. Which of the following statement is INCORRECT regarding chemosynthetic bacteria?  
(A) Chemosynthetic bacteria depend on other organisms or on dead organic matter for food.  
(B) Chemosynthetic bacteria can oxidise nitrates, nitrites and ammonia.  
(C) Chemosynthetic bacteria obtain energy for ATP production by oxidising various inorganic substances.  
(D) Chemosynthetic bacteria can recycle nutrients like nitrogen and phosphorous.
21. Which of the following diseases are caused by pathogenic bacteria?  
(i) Citrus canker  
(ii) Malaria and sleeping sickness

- (iii) Typhoid  
(iv) Influenza  
(A) only (iii) (B) only (i)  
(C) both (i) and (iii) (D) only (ii)

22. Which among the following are the smallest living cells, known without a definite cell wall, pathogenic to plants as well as animals and can survive without oxygen? [NEET (UG) 2017]  
(A) *Bacillus* (B) *Pseudomonas*  
(C) *Mycoplasma* (D) *Nostoc*

## 2.2 Kingdom Protista

23. Kingdom Protista contains  
(A) multicellular eukaryotes  
(B) unicellular prokaryotes  
(C) multicellular prokaryotes  
(D) unicellular eukaryotes
24. In which group of organisms the cell walls form two thin overlapping shells which fit together? [AIPMT RETEST 2015]  
(A) Slime moulds (B) Chrysophytes  
(C) Euglenoids (D) Dinoflagellates
25. Which of the following sets of organisms are included under the group Chrysophytes?  
(A) *Mucor* and Diatoms  
(B) Desmids and Sporozoans  
(C) Diatoms and Desmids  
(D) Diatoms and *Euglena*
26. Select the WRONG statement. [NEET P-II 2016]  
(A) Diatoms are microscopic and float passively in water.  
(B) The walls of diatoms are easily destructible.  
(C) 'Diatomaceous earth' is formed by the cell walls of diatoms.  
(D) Diatoms are chief producers in the oceans.
27. Which of the following organisms are known as chief producers in the oceans? [NEET (UG) 2018]  
(A) Cyanobacteria (B) Diatoms  
(C) Dinoflagellates (D) Euglenoids
28. Large amount of cell wall deposits of diatoms accumulate over billions of years. This is known as  
(A) red tide  
(B) desmids sea  
(C) diatomaceous earth  
(D) dead earth
29. 'Diatomaceous earth' is used in  
(A) polishing  
(B) filtration of syrups  
(C) filtration of oils  
(D) all of these



30. Chrysophytes  
(A) are commonly called dinoflagellates and desmids.  
(B) have pellicle instead of cell wall.  
(C) are parasitic forms causing disease in animals.  
(D) have indestructible wall layer deposited with silica.
31. A student observed a water drop under microscope. He found a photosynthetic organism. Its cell walls form two thin overlapping shells, which fit together as in a soap box. Which of the following organism it is? [EAMCET 2016]  
(A) Euglenoid (B) Dinoflagellate  
(C) Sporozoans (D) Diatom
32. Which one of the following is true for dinoflagellates?  
(A) They are mostly heterotrophic.  
(B) They have a proteinaceous pellicle.  
(C) They form an aggregation called plasmodium.  
(D) One of the two flagella lies transversely in a furrow between the cellulosic plates and cell wall.
33. Identify the red dinoflagellate from the following.  
(A) *Gonyaulax* (B) *Agaricus*  
(C) *Euglena* (D) *Trypanosoma*
34. Identify the unicellular organisms which forms a connecting link between plants and animals.  
(A) *Paramoecium* (B) *Entamoeba*  
(C) *Amoeba* (D) *Euglena*
35. Which of the following is NOT true for *Euglena*?  
(A) Presence of pigments identical to higher plants.  
(B) Presence of proteinaceous pellicle.  
(C) Presence of cellulosic cell wall.  
(D) Presence of short flagella.
36. **Assertion:** Euglenoids have a flexible body.  
**Reason:** They have a protein rich layer called pellicle, which makes their body flexible. Which of the following is true?  
[TS EAMCET 2018]  
(A) Both assertion and reason are true and reason is the correct explanation of assertion.  
(B) Both assertion and reason are true, but reason is not the correct explanation of assertion.  
(C) Assertion is true, but reason is false.  
(D) Assertion is false, but reason is true.
37. Which of the following is FALSE about slime moulds?  
(A) They are saprophytes protists.  
(B) They show an aggregation called as plasmodium.  
(C) They possess spores with cell walls.  
(D) They cause the disease, sleeping sickness.
38. An aggregation of organic matter in slime mould is known as  
(A) Fruiting body (B) Plasmodium  
(C) Mycelium (D) Protonema
39. Which one of the following is NOT a plant like protist? [MHT CET 2018]  
(A) Desmid (B) Dinoflagellate  
(C) Diatom (D) Slime mould
40. Which amongst the following organisms is the closest to slime moulds?  
(A) Fungi (B) Bacteria  
(C) Angiosperms (D) Algae
41. Which of the following statements is NOT true?  
(A) Amoeboid protozoans can live in fresh water, sea water or moist soil.  
(B) Sporozoans have an infectious spore like stage in their life cycle.  
(C) Ciliated protozoans have a gullet that opens to the outside of the cell surface.  
(D) Flagellated protozoans cause red tides.
42. Which of the following group of organisms are believed to be primitive relatives of animals?  
(A) Euglenoids (B) Dinoflagellates  
(C) Protozoans (D) Slime moulds
43. Match the following and choose the correct combination from the options given below:
- |      | Column I<br>(Kingdom Protista) |    | Column II<br>(Example) |
|------|--------------------------------|----|------------------------|
| i.   | Chrysophytes                   | a. | <i>Paramoecium</i>     |
| ii.  | Dinoflagellates                | b. | <i>Euglena</i>         |
| iii. | Euglenoids                     | c. | <i>Gonyaulax</i>       |
| iv.  | Protozoans                     | d. | Diatoms                |
- (A) i - a, ii - c, iii - b, iv - d  
(B) i - a, ii - d, iii - c, iv - b  
(C) i - d, ii - b, iii - c, iv - a  
(D) i - d, ii - c, iii - b, iv - a
44. *Amoeba* capture their prey by  
(A) pseudopodia (B) trichocyst  
(C) nematocyst (D) pellicle

### 2.3 Kingdom Fungi

45. Toadstools are  
(A) dinoflagellates (B) fungi  
(C) sporozoans (D) eubacteria
46. Which one of the following causes white spots to appear on mustard leaves?  
(A) Parasitic fungus (B) Sporozoans  
(C) Saprophytic (D) Parasitic protists
47. Which one of the following causes wheat rust disease in plants?  
(A) *Penicillium* (B) *Rhizopus*  
(C) *Puccinia* (D) *Albugo*



48. Fungi feed on dead organic matter and absorb nutrients, hence known as  
(A) dimorphic (B) parasites  
(C) saprophytes (D) fungicides
49. Which one of the following fungi is NOT filamentous?  
(A) *Penicillium* (B) *Mucor*  
(C) *Rhizopus* (D) Yeast
50. One of the major components of cell wall of most fungi is [NEET P-I 2016]  
(A) Cellulose (B) Hemicellulose  
(C) Chitin (D) Peptidoglycan
51. Some fungi have cross walls in their hyphae, these hyphae are called  
(A) septae (B) non-septate  
(C) septum (D) all of these
52. Which one of the following is wrong for fungi? [NEET P-II 2016]  
(A) They are both unicellular and multicellular.  
(B) They are eukaryotic.  
(C) All fungi possess a purely cellulosic cell wall.  
(D) They are heterotrophic.
53. All organisms that belong kingdom fungi are  
(A) Heterotrophs (B) Autotrophs  
(C) Multicellular (D) Infectious
54. Match Column A with Column B and select correct option.
- |      | Column A          |    | Column B                      |
|------|-------------------|----|-------------------------------|
| i.   | Hyphae            | a. | Cross-walls in hyphae         |
| ii.  | Mycelium          | b. | Slender thread like structure |
| iii. | Septae            | c. | Network of hyphae             |
| iv.  | Coenocytic hyphae | d. | Uninucleated cytoplasm        |
|      |                   | e. | Multinucleated cytoplasm      |
- (A) i – b, ii – a, iii – d, iv – c  
(B) i – e, ii – c, iii – a, iv – b  
(C) i – b, ii – c, iii – a, iv – e  
(D) i – d, ii – a, iii – c, iv – e
55. Conidia are  
(A) asexual spores in ascomycetes  
(B) present in *Aspergillus*  
(C) produced exogenously on conidiophore  
(D) all the above
56. Identify the thallic spores among following.  
(A) Zoospore (B) Conidia  
(C) Ascospore (D) Basidiospore
57. Sexual reproduction in fungi takes place by all of these, except  
(A) Oospores (B) Sporangiospores  
(C) Ascospores (D) Basidiospores
58. Fusion of protoplasts between two motile or non-motile gametes is  
(A) plasmogamy (B) karyogamy  
(C) dikaryophase (D) dikaryon
59. Formation of dikaryon occurs when  
(A) meiosis is arrested  
(B) the two haploid cells do not fuse immediately  
(C) cytoplasm does not fuse  
(D) plasmogamy occurs but karyogamy is delayed
60. After karyogamy followed by meiosis, spores are produced exogenously in [NEET (UG) 2018]  
(A) *Agaricus* (B) *Alternaria*  
(C) *Neurospora* (D) *Saccharomyces*
61. Choose the correct sequence of stages of fungal sexual cycle.  
(A) Karyogamy, Plasmogamy and Meiosis  
(B) Meiosis, Plasmogamy and Karyogamy  
(C) Plasmogamy, Karyogamy and Meiosis  
(D) Meiosis, Karyogamy and Plasmogamy
62. Which of the following features forms the basis for the division of Kingdom Fungi into various classes?  
i. Types of habitat  
ii. Fruiting bodies  
iii. Morphology of mycelium  
iv. Mode of spore formation  
(A) (i), (iii) and (iv) (B) (i) and (iv)  
(C) (i), (ii) and (iv) (D) (ii), (iii) and (iv)
63. Which of the following belongs to the group of sac fungi?  
(A) *Mucor* (B) *Albugo*  
(C) *Penicillium* (D) Mushroom
64. Mycelium of *Aspergillus* is  
(A) branched and septate  
(B) unbranched and aseptate  
(C) unicellular and branched  
(D) unicellular and septate
65. Identify the Nonmycelial fungus from the following.  
(A) *Albugo* (B) *Agaricus*  
(C) *Puccinia* (D) *Saccharomyces*
66. Complete the analogy with respect to members of various class in kingdom fungi.  
Ascomycetes : *Penicillium* :: Phycomycetes :  
(A) Yeast (B) Puffballs  
(C) *Trichoderma* (D) *Mucor*
67. Identify the INCORRECT pair.  
(A) Sexual spores – Ascospores  
(B) Fruiting bodies – Ascocarps  
(C) Morels – Edible fungi  
(D) Phycomycetes – *Neurospora*



68. Rust is a **[BCECE 2015]**  
 (A) Basidiomycete (B) Ascomycete  
 (C) Phycomycete (D) Slime mould
69. Which one of the following statement is NOT true about basidiomycetes?  
 (A) Mycelium is septate and branched.  
 (B) They reproduce by asexual spores, conidia.  
 (C) Basidiocarp is the fruiting body.  
 (D) *Puccinia* belong to this group.
70. Read the following statements and opt for the appropriate conclusion.  
**Statement I:** Basidium is a structure formed in basidiomycetes as a result of fusion of female and male gametes.  
**Statement II:** In basidiomycetes, since the sex organs are absent, plasmogamy is brought about by fusion of two somatic cells.  
 (A) Statement I is true.  
 (B) Statement II is true.  
 (C) Statement I and II are true.  
 (D) Neither of the statements are true.
71. Which one of the following statement is true about deuteromycetes?  
 (A) They reproduce only by fragmentation.  
 (B) They have only parasitic forms.  
 (C) There is isogamy type of sexual reproduction.  
 (D) *Trichoderma* is a decomposer and belongs to class deuteromycetes.
72. Which one of the following matches is correct? **[AIPMT 2015]**

(A)	<i>Alternaria</i>	Sexual reproduction absent	Deuteromycetes
(B)	<i>Mucor</i>	Reproduction by Conjugation	Ascomycetes
(C)	<i>Agaricus</i>	Parasitic fungus	Phycomycetes
(D)	<i>Trichoderma</i>	Aseptate mycelium	Basidiomycetes

73. **Assertion:** Ascomycetes are called sac fungi.  
**Reason:** They are coprophilous.  
 (A) Both assertion and reason are true and reason is the correct explanation of assertion.  
 (B) Both assertion and reason are true but reason is not the correct explanation of assertion.  
 (C) Assertion is true but reason is false.  
 (D) Both assertion and reason are false.

74. Identify the given organism. Under which group does it belong?



- (A) Phycomycetes  
 (B) Ascomycetes  
 (C) Basidiomycetes  
 (D) Deuteromycetes
75. Sexual reproduction does not occur in  
 (A) Deuteromycetes (B) Ascomycetes  
 (C) Phycomycetes (D) Both (A) and (B)
76. Identify the INCORRECT match.  
 (A) *Claviceps* – Smut  
 (B) *Rhizopus* – Bread mould  
 (C) *Puccinia* – Rust fungus  
 (D) *Albugo* – Parasitic fungi on mustard

## 2.4 Kingdom Plantae

77. Identify the CORRECT set of insectivorous plants from the following.  
 (A) *Neurospora* and Bladderwort  
 (B) Bladderwort and *Cuscuta*  
 (C) Bladderwort and Venus fly trap  
 (D) *Cuscuta* and Venus fly trap
78. Find the INCORRECT pair from the following with respect to Kingdom Plantae.  
 (A) Cell type – Eukaryotic  
 (B) Cell wall – Cellulose  
 (C) Alternation of generation – sporophytic / gametophytic  
 (D) Mode of nutrition – Holozoic
79. Alternation of generation in plants is due to  
 (A) alternate diploid sporophytic and haploid gametophytic phases which are either free living or dependent on others.  
 (B) Morphological differences in gametes.  
 (C) Dikaryophase that delays fusion of parental nuclei.  
 (D) Both (A) and (B)
80. In which of the following groups do the male and female gametophytes have independent, free living existence? **[KCET 2018]**  
 (A) Bryophytes and Gymnosperms  
 (B) Bryophytes and Pteridophytes  
 (C) Pteridophytes and Gymnosperms  
 (D) Algae and Gymnosperms

## 2.5 Kingdom Animalia

81. Members of Kingdom Animalia, digest their food in an internal cavity and store food reserves as  
 (A) nitrogenous products  
 (B) glycogen or fat  
 (C) starch  
 (D) cellulose



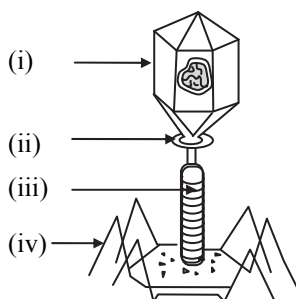


82. Select the INCORRECT statement from the following.
- (A) In animals, sexual reproduction occurs by copulation followed by embryological development.
- (B) Members of Kingdom Animalia are heterotrophic and show cell wall made up of cellulose.
- (C) Members of Kingdom Animalia show holozoic mode of nutrition.
- (D) In Kingdom Animalia, higher forms show nervous system and specialized sense organs.

### 2.6 Viruses, Viroids and Lichens

83. Which one of the following organism does NOT find a mention in Whittaker's Five Kingdom Classification?
- (A) Eubacteria (B) Lichens  
(C) Archaeobacteria (D) Algae
84. The 'flu' that we often tend to suffer from is caused due to a
- (A) virus (B) fungus  
(C) bacterium (D) lichen

85.



The given diagram is of a bacteriophage. Select the correct option for labelling (i), (ii), (iii) and (iv).

	(i)	(ii)	(iii)	(iv)
(A)	Capsid	Sheath	Collar	Flagellae
(B)	Head	Collar	Sheath	Tail fibres
(C)	Head	Sheath	Collar	Antennae
(D)	Capsid	Collar	Sheath	Tail fibres

86. Viruses have
- (A) DNA or RNA in a Lipoprotein coat.  
(B) DNA or RNA in a protein coat.  
(C) DNA and RNA in a Lipoprotein coat.  
(D) DNA and RNA in a protein coat.
87. Read the following statements and select the correct options.
- Statement I:** In general, viruses that infect plants have double stranded RNA.
- Statement II:** In general, viruses that infect animals have either ssRNA/ds RNA or ds DNA.
- (A) Statement I is true.  
(B) Statement II is true.  
(C) Statement I and II are true.  
(D) Neither of the statements is true.

88. Bacteriophages contain \_\_\_\_\_ as the genetic material.

(A) ssRNA (B) dsRNA  
(C) ssDNA (D) dsDNA

89. Potato spindle tuber disease is caused by
- (A) virus (B) bacteria  
(C) plant virus (D) viroids

90. Which of the following statements is WRONG for viroids? [NEET P-I 2016]

(A) They cause infections  
(B) Their RNA is of high molecular weight  
(C) They lack a protein coat  
(D) They are smaller than viruses

91. Viroids differ from viruses in having

[NEET (UG) 2017]

(A) DNA molecules with protein coat  
(B) DNA molecules without protein coat  
(C) RNA molecules with protein coat  
(D) RNA molecules without protein coat

92. The algal component of lichen is known as

(A) phycobiont (B) lichobiont  
(C) mycobiont (D) both (A) and (C)

93. Lichens are well known combination of an algae and a fungus where fungus has

(A) a saprophytic relationship with the algae  
(B) an epiphytic relationship with the algae  
(C) a parasitic relationship with the algae  
(D) a symbiotic relationship with the algae

94. Lichens are indicators of

(A) agriculture productivity  
(B) pollution  
(C) biodiversity  
(D) decomposition

95. Match Column A with Column B and select the correct option.

	Column A		Column B
i.	Lichens	a.	Protects nucleic acid
ii.	Capsid	b.	Decomposers
iii.	Viroids	c.	Pollution indicators
		d.	Lacks protein coat

(A) i – b, ii – d, iii – a  
(B) i – c, ii – a, iii – d  
(C) i – c, ii – d, iii – a  
(D) i – d, ii – a, iii – c

96. Which of the following diseases are caused by viruses?

i. Small pox (ii) Malaria  
iii. Cholera (iv) Tetanus  
v. Herpes

(A) (i), (iii) and (v)  
(B) (ii), (iv) and (v)  
(C) (i) and (v)  
(D) (iii) and (v)



97. Match Column I and Column II and select the correct option.

	Column I		Column II
i.	T.O. Diener	a.	<i>Contagium vivum fluidum</i>
ii.	M.W. Beijerinck	b.	Showed that viruses could be crystallised
iii.	D.J. Ivanowsky	c.	Discovered a new infectious agent smaller than viruses
iv.	W.M. Stanlay	d.	Recognised certain microbes as causal organism of the mosaic disease of tobacco

- (A) i - d, ii - b, iii - c, iv - a  
 (B) i - b, ii - c, iii - d, iv - a  
 (C) i - a, ii - c, iii - d, iv - b  
 (D) i - c, ii - a, iii - d, iv - b

#### Miscellaneous

98. In the five kingdom classification, which kingdom occupies intermediate position from phylogenetic point of view?  
 (A) Monera  
 (B) Protista  
 (C) Plantae  
 (D) None of the above
99. Identify the correct match from the table given below.

	Kingdom	Characteristic feature
(A)	Plantae	Cell wall is made up of cellulose
(B)	Protista	Cell type is prokaryotic
(C)	Monera	Nuclear membrane present
(D)	Animalia	Autotrophic mode of nutrition.

100. In deep sea water, which of the following are likely to be present?  
 (A) Saprophytic fungi (B) Eubacteria  
 (C) Cyanobacteria (D) Archaeobacteria
101. Methanogens belong to [NEET P-II 2016]  
 (A) Slime moulds  
 (B) Eubacteria  
 (C) Archaeobacteria  
 (D) Dinoflagellates
102. Algae differ from fungi in being  
 (A) heterotrophic  
 (B) without motile gametes  
 (C) without unicellular forms  
 (D) with chlorophyll and possessing cellulosic wall

103. Which one of the following statements is wrong? [NEET P-I 2016]  
 (A) Eubacteria are also called false bacteria.  
 (B) Phycomycetes are also called algal fungi.  
 (C) Cyanobacteria are also called blue-green algae.  
 (D) Golden algae are also called desmids.
104. Which among the following is called plankton?  
 (A) Golden algae (B) *Pila*  
 (C) *Sycon* (D) *Trypanosoma*
105. Identify the ODD one out.  
 (A) Euglenoids (B) Phycomycetes  
 (C) Slime moulds (D) Dinoflagellates
106. In \_\_\_\_\_, sexual reproduction is by oospores, ascospores and basidiospores.  
 (A) Fungi (B) Monera  
 (C) Protista (D) Plantae
107. Mycorrhiza is an association of roots of *Pinus* and  
 (A) Fungus (B) Alga  
 (C) Bacteria (D) Ants
108. Choose the wrong statement. [AIPMT RETEST 2015]  
 (A) Yeast is unicellular and useful in fermentation.  
 (B) *Penicillium* is multicellular and produces antibiotics.  
 (C) *Neurospora* is used in the study of biochemical genetics.  
 (D) Morels and truffles are poisonous mushrooms.
109. Which of the following are most suitable indicators of SO<sub>2</sub> pollution in the environment? [AIPMT RETEST 2015]  
 (A) Fungi (B) Lichens  
 (C) Conifers (D) Algae
110. Cellulose is the major component of cell wall of  
 (A) *Euglena* (B) *Saccharomyces*  
 (C) Pteridophyte (D) *Nostoc*
111. Desmids are  
 (A) Archaeobacteria (B) Eubacteria  
 (C) Saprotrophs (D) Protists
112. Which amongst the following is non-cellular and on infection replicates inside the host cell?  
 (A) Monera (B) Protista  
 (C) Viruses (D) Fungi
113. Chrysophytes, Euglenoids, Dinoflagellates and Slime moulds are included in the kingdom [NEET P-I 2016]  
 (A) Fungi (B) Animalia  
 (C) Monera (D) Protista
114. Citrus canker is caused by which of the following organisms?  
 (A) Archaeobacteria (B) Diatoms  
 (C) Bacteria (D) Slime mould



115. Organisms that cause occurrence of red oceanic tides are  
(A) Diatoms (B) Dinoflagellates  
(C) Red algae (D) Euglenoids
116. Blue green algae belong to kingdom  
(A) Monera (B) Protista  
(C) Plantae (D) Animalia
117. Puff ball is a type of  
(A) fungus (B) alga  
(C) virus (D) pteridophyte
118. Cyanobacteria are included under which kingdom?  
(A) Monera (B) Plantae  
(C) Protista (D) Algae
119. Which one of the following organism is NOT a parasite?  
(A) *Trypanosoma* (B) *Entamoeba*  
(C) *Plasmodium* (D) *Euglena*
120. Which among the following is not a prokaryote? [NEET (UG) 2018]  
(A) *Nostoc* (B) *Mycobacterium*  
(C) *Saccharomyces* (D) *Oscillatoria*
121. Select the WRONG statement. [NEET (UG) 2018]  
(A) Pseudopodia are locomotory and feeding structures in Sporozoans  
(B) Mushrooms belong to Basidiomycetes  
(C) Cell wall is present in members of Fungi and Plantae  
(D) Mitochondria are the powerhouse of the cell in all kingdoms except Monera
122. Following is a free living protozoa [BCECE (Stage 1) 2016]  
(A) *Giardia* (B) *Monocystis*  
(C) *Euglena* (D) *Plasmodium*
123. Ciliates differ from all other protozoans in [NEET (UG) 2018]  
(A) using pseudopodia for capturing prey  
(B) having a contractile vacuole for removing excess water  
(C) using flagella for locomotion  
(D) having two types of nuclei

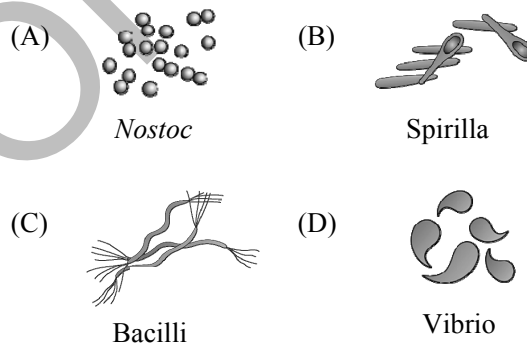
**Practice Problems****2.0 Introduction**

1. Which of the following is not a criterion for classification of Five Kingdom System suggested by R.H. Whittaker?  
(A) Presence or absence of a well defined nucleus.  
(B) Sexual or asexual mode of reproduction.  
(C) Autotrophic or heterotrophic mode of nutrition.  
(D) Unicellular or multicellular body organization.

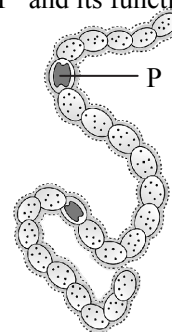
2. Consider the following statements.  
a. Biological classification is the scientific ordering of organisms in a hierarchical series of group on the basis of their morphological, evolutionary and other relationships.  
b. Linnaeus classified organisms on the basis of autotrophic and heterotrophic mode of nutrition.  
c. Aristotle divided animals into two groups such as animals with red blood and without red blood.
- Which of the statements given above are correct?  
(A) a and b (B) a and c  
(C) b and c (D) a, b and c

**2.1 Kingdom Monera**

3. Given below are different shapes of bacteria. Identify which of them is labelled correctly.



4. In the given figure of *Nostoc*, identify the part 'P'. Select the correct option with correct name of part 'P' and its function.



- (A) Nucleus – Helps in division of cell  
(B) Heterocyst – Nitrogen fixation  
(C) Chloroplast – Photosynthesis  
(D) Plasmodium – Store spores
5. Which of the following is not true regarding bacteria?  
(A) Bacteria are helpful in curdling of milk.  
(B) Fix nitrogen in leguminous plants.  
(C) Utilised in production of antibiotics.  
(D) Used in making bread and beer.



6. Mycoplasma is  
 (A) eukaryotic and unicellular  
 (B) prokaryotic and unicellular  
 (C) eukaryotic and multicellular  
 (D) prokaryotic and multicellular
7. Read the following statements and select the INCORRECT statement.  
 (A) Though the bacterial structure is very simple, they are very complex in behaviour.  
 (B) Chemosynthetic autotrophic bacteria play a great role in recycling nutrients like nitrogen, phosphorous iron and sulphur.  
 (C) Majority of the heterotrophic bacteria are important decomposers.  
 (D) Autotrophic bacteria synthesize their food from organic substrates.
8. Read the statements (a – c) given below and select the correct option.  
 a. Bacteria shows both autotrophic and heterotrophic nutrition.  
 b. Some of the bacteria are autotrophic. They may be photosynthetic autotrophic or chemosynthetic autotrophic.  
 c. Very few bacteria found in nature show heterotrophic mode of nutrition.  
 (A) a and b are true  
 (B) a is true, b and c are false  
 (C) a, b and c are true  
 (D) Only a is true.
9. Read the given statements regarding Cyanobacteria and identify the correct one.  
 I. The Cyanobacteria are unicellular, colonial or filamentous, and are commonly found in most harsh habitats.  
 II. The colonies of Cyanobacteria often form blooms in polluted water bodies.  
 (A) Only I (B) Only II  
 (C) I and II (D) None of these
10. Desmids are commonly known as  
 (A) Blue green algae (B) Red algae  
 (C) Golden algae (D) Brown algae
11. **Assertion:** *Gonyaulax* multiply rapidly and exhibits red tides.  
**Reason:** *Gonyaulax*, release toxins which may result in the death of many marine animals such as fishes.  
 (A) Both assertion and reason are true and reason is the correct explanation of assertion.  
 (B) Both assertion and reason are true but reason is not the correct explanation of assertion.  
 (C) Assertion is true but reason is false.  
 (D) Both assertion and reason are false.
12. Read the following statements about *Trypanosoma* and choose the correct option?  
 i. It is ciliated protozoan.  
 ii. It has flagella.  
 iii. It is an actively moving organism due to presence of thousands of cilia.  
 iv. It causes sleeping sickness disease.  
 v. It belongs to kingdom Protista.  
 (A) i, iii, and v are correct  
 (B) ii, iv and v are correct  
 (C) i, iii and iv are correct  
 (D) only i and iii are correct
13. Which one of the following statement is INCORRECT?  
 (A) Diatoms are planktons that float passively in water currents.  
 (B) Euglenoids have a protein rich mucilagenous sheath.  
 (C) All protozoans are predators or parasites.  
 (D) Slime moulds are saprophytic protists.
14. Which of the following is INCORRECT about Protista?  
 (A) Protistans are both autotrophic and heterotrophic  
 (B) Some protists have cell walls  
 (C) Protists does not have membrane bound organelles  
 (D) All of the above
15. Which of the given statements is/are correct?  
 I. Kingdom Protista forms a link between monerans and the other organisms like plants, animal and fungi.  
 II. Protists reproduce asexually and sexually by a process involving cell fusion and zygote formation.  
 III. Being eukaryotes, the protistan cell body contains a well defined nucleus and other membrane-bound organelles.  
 (A) I and II (B) I and III  
 (C) II and III (D) I, II and III
16. Which of the following is correct regarding *Euglena*?  
 (A) Its cell wall has stiff cellulose plates on the outer surface.  
 (B) It is a photosynthetic organism, but can live as a heterotroph in absence of sunlight.  
 (C) Majority of them are found in marine water.  
 (D) Under suitable condition, they form an aggregation called plasmodium.

## 2.2 Kingdom Protista

10. Desmids are commonly known as  
 (A) Blue green algae (B) Red algae  
 (C) Golden algae (D) Brown algae
11. **Assertion:** *Gonyaulax* multiply rapidly and exhibits red tides.  
**Reason:** *Gonyaulax*, release toxins which may result in the death of many marine animals such as fishes.  
 (A) Both assertion and reason are true and reason is the correct explanation of assertion.  
 (B) Both assertion and reason are true but reason is not the correct explanation of assertion.



17. *Paramecium*
- is a ciliated protozoan.
  - has a cavity that opens to the outside the cell surface.
  - shows water current maintained by flagella which helps the food to be steered into gullet.
- Which of the following statements given above are correct?
- (A) I and II                      (B) I and III  
(C) II and III                    (D) I, II and III
18. Consider the following statements.
- Diatom is porous and chemically inert. It is therefore, used in filtration of sugars, alcohols, oils, syrups and antibiotics.
  - Diatomite deposits are often accompanied by petroleum fields.
  - Desmids are mainly found in dirty water and are usually indicators of polluted water.
- Which of the statements given above are correct?
- (A) I and II                      (B) I and III  
(C) II and III                    (D) I, II and III
19. Which one of the following is correct about Chrysophytes?
- (A) They are parasitic forms which cause disease in animals.  
(B) They have a protein rich layer called pellicle.  
(C) They include diatoms and desmids.  
(D) They are found in marine environment only.

### 2.3 Kingdom Fungi

20. Which of the following is correct regarding sexual cycle of different fungi?
- (A) Sexual reproduction is by conidia or sporangiospores.  
(B) Asexual reproduction occurs by means of ascospores.  
(C) Fusion of gametes, i.e. plasmogamy gives rise to basidium.  
(D) In ascomycetes, dikaryophase is an intervening phase wherein karyogamy is delayed.
21. Which one of the following statement is true about imperfect fungi?
- (A) They have only vegetative phases.  
(B) They include toadstools and puffballs.  
(C) They include species that prey only on nematodes.  
(D) They include edible members like morels and truffles.

22. Identify the correct match and select the correct option?

(A)	<i>Rhizopus</i>	Sexual reproduction is absent	Phycomycetes
(B)	<i>Penicillium</i>	Mycelium is septate	Deuteromycetes
(C)	<i>Agaricus</i>	Plasmogamy is by fusion of somatic cells	Basidiomycetes
(D)	<i>Trichoderma</i>	Sexual reproduction by oospores	Phycomycetes

23. In Phycomycetes, asexual reproduction occurs by zoospores or by aplanospores. Regarding these spores, consider the following statements and select the correct option.
- Statement I:** These spores are endogenously produced in sporangium.  
**Statement II:** Zoospores are also called as aplanospores.
- (A) I is true, but II is false  
(B) I is false, but II is true  
(C) I and II are true  
(D) I and II are false
24. Read the given statements about sexual reproduction in fungi.
- In class Phycomycetes, sexual reproduction produces a resting diploid spore called zygospore.
  - Zygospores are formed by the fusion of two gametes.
  - Gametes forming zygospores are always similar in morphology (oogamous).
- Which of the statements given above are correct?
- (A) I and II                      (B) I and III  
(C) II and III                    (D) I, II and III
25. Read the following statements.
- Mycelium is branched and septate.
  - The asexual spores are generally not formed.
  - Vegetative reproduction takes place by fragmentation.
  - Sex organs are absent but sexual reproduction takes place by somatogamy.
  - Karyogamy and meiosis takes place in basidium to form four haploid basidiospores.
  - Basidia are arranged in fruiting bodies called basidiocarp.
- The above statements are assigned to
- (A) Sac fungi                      (B) Bracket fungi  
(C) Imperfecti fungi              (D) Club fungi



## 2.4 Kingdom Plantae

26. Read the statements given below and select the correct option.
- All bryophytes belong to Kingdom Plantae.
  - Some autotrophic plants are insectivorous.
  - Members of Kingdom Plantae are multicellular, prokaryotic and are complex.
  - Mosses belong to Kingdom Plantae.
- (A) Statements I and II are true.  
 (B) Statements I and III are true.  
 (C) Statements I, II and IV are true.  
 (D) All the statements are true.
27. Similarity in Bryophytes and Cyanobacteria is
- (A) both are unicellular.  
 (B) both possess chlorophyll a.  
 (C) cell wall is absent in both  
 (D) both show completion of life cycle in two different hosts.

## 2.5 Kingdom Animalia

28. Which one of the following is NOT the salient feature of Kingdom Animalia?
- (A) Heterotrophic and eukaryotic organisms.  
 (B) Multicellular organisms with indefinite growth.  
 (C) Higher forms exhibit sensory and neuromotor mechanism.  
 (D) Sexual reproduction by copulation.

## 2.6 Viruses, Viroids and Lichens

29. Read the given statements about characteristics of viruses and select the correct option.
- They have their own metabolic system.
  - They contain either DNA or RNA.
  - They are easily killed by antibiotics.
  - They are facultative parasites.
- (A) i and ii are correct  
 (B) ii and iv are correct  
 (C) only ii is correct  
 (D) only iv is correct
30. Which type of nucleic acid is present in TMV?
- (A) ssRNA (B) dsRNA  
 (C) ssDNA (D) dsDNA
31. Which of the following is INCORRECT regarding viruses?
- (A) Viruses are obligate parasites.  
 (B) Viruses that infect plants have single stranded RNA.  
 (C) In viruses, protein coat called pellicle protects the nucleic acid.  
 (D) Bacteriophages are the viruses that infect bacteria.

32. Lichen constitutes
- (A) symbiotic association of an alga and a fungus  
 (B) parasitic association of an alga and a fungus  
 (C) mycorrhizal association  
 (D) commensalism
33. Which of the following statement is correct about Lichen?
- (A) Lichen is saprophytic organism.  
 (B) The mode of nutrition in Lichen is holozoic.  
 (C) Some species of Lichens are insectivorous.  
 (D) Lichens are autotrophic organisms.

## Miscellaneous

34. Read the following statements and opt for the correct option.
- Statement I:** Some of the bacteria can synthesize their own food hence they are either photosynthetic autotrophs or chemosynthetic autotrophs.  
**Statement II:** Due to presence of Chlorophyll a and rigid cell wall, blue-green algae are placed under Algae.
- (A) Statement I is true.  
 (B) Statement II is true.  
 (C) Statement I and II are true.  
 (D) Neither of the statements is true.
35. Identify the organism that behaves like heterotroph and predate on small organisms when deprived of sunlight.
- (A) *Euglena* (B) *Gonyaulax*  
 (C) Slime moulds (D) Desmids
36. According to five kingdom classification, *Gonyaulax* is placed under which kingdom?
- (A) Kingdom Fungi  
 (B) Kingdom Protista  
 (C) Kingdom Monera  
 (D) Kingdom Plantae
37. Which of the following set does not possess fungus at all?
- (A) TMV, *Euglena*, *Puccinia*  
 (B) *Nostoc*, Mycoplasma, *Trypanosoma*  
 (C) *Rhizopus*, *Adiantum*, Desmids  
 (D) *Colletotrichum*, *Anabaena*, *Gonyaulax*
38. Which one of the following statement is correct?
- (A) Slime moulds are autotrophic protists.  
 (B) Protozoans lack cell wall.  
 (C) Dinoflagellates are immotile.  
 (D) Pellicle is absent in *Euglena*.



39. Which of the following is not a characteristic feature of Kingdom Protista?
- (A) Well defined nucleus  
(B) Membrane bound organelles  
(C) Includes eubacteria containing chlorophyll  
(D) Autotrophic as well as Heterotrophic nutrition.

40. Match the column I (Kingdom) and II (Body organisation), and choose the correct the options.

	Column I		Column II
i.	Plantae	a.	Cellular
ii.	Monera	b.	Multicellular/loose tissue
iii.	Fungi	c.	Tissue/organ
iv.	Animalia	d.	Tissue/organ/organ system
v.	Protista	e.	Tissue

- (A) i – d, ii – a, iii – b, iv – c, v – e  
(B) i – c, ii – a, iii – b, iv – d, v – e  
(C) i – c, ii – b, iii – e, iv – d, v – a  
(D) i – c, ii – a, iii – b, iv – d, v – a

41. Match Column I (Kingdom) and Column II (Mode of Nutrition) and select the correct option.

	Column I		Column II
i.	Monera	a.	Autotrophic
ii.	Protista	b.	Heterotrophic
iii.	Fungi	c.	both autotrophic and heterotrophic
iv.	Plantae		
v.	Animalia		

- (A) i – c, ii – c, iii – b, iv – a, v – b  
(B) i – b, ii – a, iii – b, iv – c, v – b  
(C) i – c, ii – b, iii – c, iv – a, v – c  
(D) i – b, ii – c, iii – b, iv – c, v – b

42. Which one of the given statement is INCORRECT?

- (A) The colonies of Cyanobacteria are generally surrounded by gelatinous sheath.  
(B) Members of Protista are primarily aquatic.  
(C) *Rhizopus* belongs to class Phycomycetes of Kingdom Fungi.  
(D) Bacteria are grouped under two categories based on their shape.

43. Study the given pairs of 'Types of spores and their production'.

- i. Zoospores – Endogenous  
ii. Aplanospores – Exogenous

- iii. Ascospores – Endogenous  
iv. Conidia – Endogenous  
v. Basidiospores – Exogenous

The correct pairs are

- (A) i, ii and iv (B) i, iii and v  
(C) ii, iii and v (D) iii, iv and v

44. Which of the statements given below are INCORRECT?

- i. Methanogens are eubacteria which produce methane in marshy areas.  
ii. *Nostoc* is a filamentous blue green algae which fixes atmospheric  $N_2$ .  
iii. Chemosynthetic autotrophic bacteria synthesize cellulose from glucose.  
iv. Mycoplasma lack cell wall and can survive without oxygen.  
(A) ii, iv (B) i, ii, iii  
(C) ii, iii, iv (D) i, iii

45. Select the correct statement from the following.

- (A) *Paramoecium* and *Trypanosoma* belong to same kingdom as that of *Saccharomyces*.  
(B) Lichen shows symbiotic association of an alga and a protozoan.  
(C) Yeast used for making bread and beer belongs to same kingdom as that of Morels.  
(D) *Nostoc* and *Anabaena* are protists.

46. Read the given statements and select the correct conclusion.

**Statement I:** Five kingdom system of classification did not differentiate between the non-photosynthetic organisms like fungi and photosynthetic green plants, though they showed a characteristic difference in their wall composition.

**Statement II:** Fungi wall contains chitin, while the green plants have a cellulosic cell wall.

Conclusion:

- (A) I is true, but II is false  
(B) I is false, but II is true  
(C) I and II are true  
(D) I and II are false

47. Which one of the following pairs is correctly matched?

- (A) *Anabaena* – Red Tide  
(B) Mycorrhizae – Roots of higher plants  
(C) Yeast – Production of biogas  
(D) Citrus canker – Caused by virus



### Problems To Ponder

1. Match the columns and select the correct option.

	Column I		Column II		Column III
a.	Amoeboid protozoans	i.	<i>Plasmodium</i>	p.	causes sleeping sickness
b.	Flagellated protozoan	ii.	<i>Paramoecium</i>	q.	have a gullet that opens to the outside of the cell surfaces
c.	Ciliated protozoan	iii.	<i>Trypanosoma</i>	r.	have an infectious spore-like stage in life cycle.
d.	Sporozoans	iv.	<i>Amoeba</i>	s.	move and capture prey by putting out pseudopodia

- (A) a – ii – p; b – i – q; c – iv – r; d – iii – s  
 (B) a – iv – s; b – iii – r; c – ii – q; d – i – p  
 (C) a – ii – r; b – iv – q; c – i – s; d – iii – p  
 (D) a – iv – s; b – iii – p; c – ii – q; d – i – r

2. Read the given statements and choose the correct option which states whether they are True or False.

- I. The fungi constitutes a unique kingdom of heterotrophic organisms.
- II. The common mushroom and toad stools are fungi.
- III. White spots seen on mustard leaves are due to presence of parasitic fungus.
- IV. Some unicellular fungi (*Ustilago*) are used to make bread and beer.
- V. All the members of Ascomycetes are multicellular.
- VI. *Penicillium* yields the antibiotic penicillin.

**True                      False**

- (A) I, II, III              IV, V, VI  
 (B) I, II, III, VI        IV, V  
 (C) II, III, VI            I, IV, V  
 (D) IV, V                I, II, III, VI

3. Identify the odd one out in each of the following sets with respect to classes of kingdom fungi and select the correct option.

- i. *Albugo*, *Rhizopus*, *Penicillium*
- ii. *Ustilago*, Yeast, *Neurospora*

- iii. *Alternaria*, *Agaricus*, *Trichoderma*
- iv. Bracket fungi, Rust fungus, Bread mould

	i.	ii.	iii.	iv.
(A)	<i>Rhizopus</i>	Yeast	<i>Alternaria</i>	Rust fungus
(B)	<i>Penicillium</i>	<i>Ustilago</i>	<i>Agaricus</i>	Bread mould
(C)	<i>Rhizopus</i>	<i>Neurospora</i>	<i>Trichoderma</i>	Bread mould
(D)	<i>Albugo</i>	Yeast	<i>Agaricus</i>	Bracket fungi

4. Match the columns and select the correct option.

	Column I		Column II		Column III
i.	Fungi that absorb soluble organic matter from dead substrates	a.	Symbionts	p.	Lichens
ii.	Fungi that live in association with others	b.	Parasites	q.	<i>Trichoderma</i>
iii.	Fungi that depend on living plants and animals	c.	Saprophytes	r.	<i>Albugo</i>

- (A) i – a – q, ii – c – r, iii – b – p  
 (B) i – c – r, ii – b – q, iii – a – p  
 (C) i – c – q, ii – a – p, iii – b – r  
 (D) i – b – r, ii – c – p, iii – a – q

5. Which of the following is not a product of sexual reproduction in fungi?

- (A) zygospores  
 (B) ascospores  
 (C) zoospores  
 (D) none of these

6. Select the correct option from the following.

- i. Phycomycetes – Coprophilous fungi
  - ii. Ascomycetes – Sac fungi
  - iii. Basidiomycetes – bracket fungi
  - iv. Deuteromycetes – perfect fungi
- (A) i and iv are incorrect  
 (B) ii, iii and iv are correct  
 (C) ii and iv are incorrect  
 (D) i, ii and iii are correct

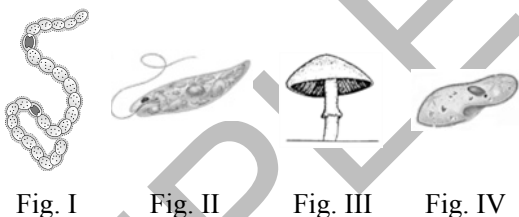




7. Read the given statements and select the correct option.
- Members of phycocomycetes can be found in aquatic habitats.
  - Ascomycetes are mostly multicellular such as *Saccharomyces*.
  - Dikaryotic stage is commonly found in Phycomycetes.
  - Basidiospores are endogenously produced in the basidium.
- (A) i, iii and iv are correct  
 (B) only ii and iii are correct  
 (C) ii, iii and iv are incorrect  
 (D) only iii and iv are incorrect
8. Fill in the blanks by selecting the correct option.
- (i) are chief producers in the oceans and belongs to class (ii).
  - (iii) are the smallest living cells and can survive without oxygen.
  - In Lichens, phycobiont is (iv).

	(i)	(ii)	(iii)	(iv)
(A)	Desmids	Deuteromycetes	Yeast	Parasitic
(B)	Diatoms	Chrysophytes	Mycoplasma	Auto-trophic
(C)	Blue green algae	Eubacteria	<i>Euglena</i>	Symbiotic
(D)	Alage	Chlorophyceae	Viruses	Non-photo-synthetic

9.



Observe the given figures of different organisms and read the given statements. Select the CORRECT statement from the following.

12. Which of the following option gives the CORRECT similarity and difference between Example 1 and 2?

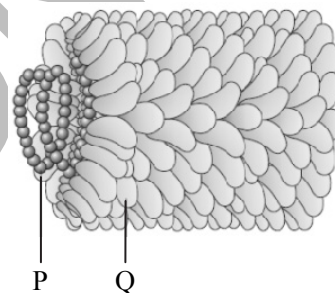
	Example 1	Example 2	Similarity	Difference
(A)	Diatoms	<i>Euglena</i>	Both belongs to Chrysophytes	Ditoms are heterotrophic and <i>Euglena</i> is photosynthetic as well as heterotrophic
(B)	<i>Penicillium</i>	<i>Puccinia</i>	Both belongs to kingdom fungi	<i>Penicillium</i> belongs to class phycocomycetes and <i>Puccinia</i> belongs to class Ascomycetes
(C)	Viruses	Viroids	Both are acellular	Viruses lack protein coat which is present in Viroids.
(D)	<i>Anabaena</i>	Methanogens	Both are prokaryotic	<i>Anabaena</i> can fix atmospheric nitrogen whereas, Methanogens are responsible for production of biogas.

- Fig. II: It behaves like predator in absence of sunlight.
- Fig. I: It belongs to class chrysophytes of kingdom Protista.
- Fig. III: It belongs to the same class as that of rust fungus.
- Fig. IV: It is the member of flagellated protozoan group.
- Fig. II: It has protein rich layer called as capsid which makes its body flexible.
- Fig. III: It belongs to the class where sex organs are absent.
- Fig. IV: It is an aquatic organism.
- Fig. I: It belongs to the same class as that of methanogens.

The correct statements are

- (A) a, c, f, g                      (B) b, e, f, h  
 (C) a and f                        (D) d, e, h

10. Identify the organism and the structures marked as P and Q in the given figure.



	Name of organism	(P)	(Q)
(A)	Bacteriophage	RNA	Capsomere
(B)	TMV	RNA	Capsid
(C)	TMV	DNA	Tail fibres
(D)	Bacteriophage	DNA	Capsid

11. Maximum nutritional diversity is found in the kingdom
- (A) Fungi  
 (B) Animalia  
 (C) Monera  
 (D) Plantae



## Answer Key



### Concept Building Problems

1. (D) 2. (D) 3. (D) 4. (C) 5. (C) 6. (C) 7. (B) 8. (C) 9. (B) 10. (A)  
 11. (B) 12. (C) 13. (D) 14. (A) 15. (B) 16. (B) 17. (A) 18. (B) 19. (A) 20. (A)  
 21. (C) 22. (C) 23. (D) 24. (B) 25. (C) 26. (B) 27. (B) 28. (C) 29. (D) 30. (D)  
 31. (D) 32. (D) 33. (A) 34. (D) 35. (C) 36. (A) 37. (D) 38. (B) 39. (D) 40. (A)  
 41. (D) 42. (C) 43. (D) 44. (A) 45. (B) 46. (A) 47. (C) 48. (C) 49. (D) 50. (C)  
 51. (A) 52. (C) 53. (A) 54. (C) 55. (D) 56. (B) 57. (B) 58. (A) 59. (D) 60. (A)  
 61. (C) 62. (D) 63. (C) 64. (A) 65. (D) 66. (D) 67. (D) 68. (A) 69. (B) 70. (B)  
 71. (D) 72. (A) 73. (B) 74. (C) 75. (A) 76. (A) 77. (C) 78. (D) 79. (A) 80. (B)  
 81. (B) 82. (B) 83. (B) 84. (A) 85. (B) 86. (B) 87. (B) 88. (D) 89. (D) 90. (B)  
 91. (D) 92. (A) 93. (D) 94. (B) 95. (B) 96. (C) 97. (D) 98. (B) 99. (A) 100. (D)  
 101. (C) 102. (D) 103. (A) 104. (A) 105. (B) 106. (A) 107. (A) 108. (D) 109. (B) 110. (C)  
 111. (D) 112. (C) 113. (D) 114. (C) 115. (B) 116. (A) 117. (A) 118. (A) 119. (D) 120. (C)  
 121. (A) 122. (C) 123. (D)



### Practice Problems

1. (B) 2. (B) 3. (D) 4. (B) 5. (D) 6. (B) 7. (D) 8. (A) 9. (B) 10. (C)  
 11. (B) 12. (B) 13. (B) 14. (C) 15. (D) 16. (B) 17. (A) 18. (A) 19. (C) 20. (D)  
 21. (A) 22. (C) 23. (A) 24. (A) 25. (B) 26. (C) 27. (B) 28. (B) 29. (C) 30. (A)  
 31. (C) 32. (A) 33. (D) 34. (A) 35. (A) 36. (B) 37. (B) 38. (B) 39. (C) 40. (D)  
 41. (A) 42. (D) 43. (B) 44. (D) 45. (C) 46. (B) 47. (B)



### Problems To Ponder

1. (D) 2. (B) 3. (B) 4. (C) 5. (C) 6. (A) 7. (C) 8. (B) 9. (A) 10. (B)  
 11. (C) 12. (D)

## Hints



### Concept Building Problems

9. Eubacteria are either motile (locomotion is due to gliding movement or by flagella) or non-motile.
10. Bacteria found in extremely saline conditions are called halophiles. Archaeobacteria includes bacteria that survive in most harsh habitats such as extreme salty area, hot springs and marshy area.
12. Hot springs are the habitat of thermoacidophiles.
15. Methanogens are present in the gut of several ruminant animals and are responsible for the production of methane.
24. Overlapping shells are present in diatoms, member of Chrysophytes.

26. The wall of diatoms contains cellulose and Silica. They do not decay easily. After death, they are deposited at the bottom in water and form diatomaceous earth.
35. Instead of cell wall, euglenoids have a protein layer called pellicle.
37. Sleeping sickness is caused by flagellated protozoan *Trypanosoma*.
39. Slime mould is a fungi-like protist.
40. Slime moulds are saprophytic and lack cell wall. They share the characters of both animals and fungi, thus commonly called as fungus animals.
41. Red tide is caused due to red dinoflagellates.
49. Yeast is a unicellular fungi.
52. In fungi, cell wall is usually composed of Chitin.



53. Heterotrophs: Fungi (lack chlorophyll) obtain their nutrition from the extracellular digestion and absorption of the digested material. Fungi can be saprophytic or parasitic.
57. Asexual reproduction takes place by sporangiospores.
59. Fusion of two vegetative or somatic cells produces a dikaryon. It is a cell which contains two nuclei. In this karyogamy (fusion of nuclei) is delayed.
60. In *Agaricus*, spores are produced exogenously where as in *Neurospora* and *Saccharomyces* spores are produced endogenously. *Alternaria* does not produce sexual spores.
65. *Saccharomyces cerevisiae* (yeast) is a fungus which is unicellular and without mycelium.
66. Yeast – Ascomycetes;  
Puffballs – Basidiomycetes;  
*Trichoderma* – Deuteromycetes
67. *Neurospora* belongs to class Ascomycetes.
69. Asexual spores, conidia are generally not found in Basidiomycetes.
71. The deuteromycetes reproduce only by asexual spores (conidia). Some members of deuteromycetes are saprophytes or parasites, whereas large number of them are decomposers.
73. Ascomycetes are called sac fungi because they produce spores in a sac like structure.
76. *Ustilago* – smut
77. *Neurospora* belongs to Kingdom Fungi, while *Cuscuta* is a parasitic plant.
78. Very few members of Kingdom Plantae are partially heterotrophs such as Bladderwort, Venus fly trap, *Cuscuta*, etc. Majority of the plants are autotrophs.
80. Algae (Thallophytes) have independent gametophytes, however gametophytes of Gymnosperms do not have independent free living existence.
82. Animal cells lack cell wall.
86. Viruses have a protein coat (capsid) that protects the nucleic acids, i.e. DNA or RNA
87. In general, viruses that infect plants have single stranded RNA.
90. The RNA of viroids is of low molecular weight.
91. Viroids are smaller than viruses. They are regarded as sub-viral agents or free RNA, without protein coat (usually found in viruses). They are infectious RNA. e.g. Potato spindle tuber disease.
94. Lichens do not grow in polluted areas.
98. In the five kingdom classification, Protista occupies intermediate position from phylogenetic point of view. Because all multicellular eukaryotes like plants, fungi and animals have originated from unicellular eukaryotic Protista.
100. Archaeobacteria are found in most extreme environments like hot sulphur springs, Ocean waters around Antarctica, in Dead sea, Great-salt lake, etc.
101. Methanogens are biogas producing, obligate anaerobes, which belong to Archaeobacteria.
102. Algae are photosynthetic and have cellulosic cell wall, whereas fungi are heterotrophic and have chitinised wall.
103. Eubacteria are also called true bacteria.
104. Golden algae are microscopic and float passively in water current. Golden algae are Chrysophytes and are called planktons. *Pila* and *Sycon* belong to Phylum Mollusca and Porifera respectively from Kingdom Animalia. *Trypanosoma* is flagellated Protozoan.
105. Phycomycetes belongs to Kingdom Fungi, while others belong to Kingdom Protista.
108. Morels and truffles are edible members of ascomycetes.
109. Lichens are SO<sub>2</sub> pollution indicators because they do not grow in SO<sub>2</sub> polluted habitat.
110. Plant cell wall is made up of cellulose.
115. Red tides of oceans are due to excessive growth of dinoflagellates like *Gymnodinium* and *Gonyaulax*.
117. Puff ball commonly known as bracket fungi are common forms of basidiomycetes.
118. Bacteria are the sole members of Kingdom Monera with presence of rigid cell wall and are unicellular.
120. *Saccharomyces* (yeast) is eukaryotic unicellular fungi. *Mycobacterium* is a bacterium. *Oscillatoria* and *Nostoc* are cyanobacteria.
121. Pseudopodia are locomotory and feeding structures in Protozoans.



## Practice Problems

5. Yeasts are used in making bread and beer.
7. Autotrophic bacteria synthesize their own food from inorganic substrates.
8. Heterotrophic bacteria are the most abundant in nature.
9. The Cyanobacteria are freshwater/marine or terrestrial algae.
13. *Euglena* possess a protein rich layer called pellicle instead of cell wall which makes their body flexible.
14. Protists have a well defined nucleus and other membrane bound organelles.
17. In *Paramecium*, rows of cilia shows coordinated movement which causes the water heavily loaded with food to be steered into the gullet.
20. Conidia are asexual spores. Ascospores are sexual spores. Two vegetative or somatic cells of different strain fuse to form basidium.
24. The two gametes forming zygospores are similar in morphology (isogamous) or dissimilar (anisogamous or oogamous).
26. Members of Kingdom Plantae are eukaryotic.
29. Viruses do not have their own metabolic system. They are not easily killed by antibiotics and are obligatory intracellular parasites.
30. Viruses that infect plants have single stranded RNA. TMV was first discovered in tobacco plants. TMV stands for Tobacco Mosaic Virus.
31. In viruses, the nucleic acid is protected by a protein coat called capsid, which is made up of small subunits called capsomeres.
33. In Lichens, algal partner does the function of photosynthesis, thus it is autotrophic in nature.
34. Blue-green algae (cyanobacteria) are Eubacteria.
35. *Euglena* having chlorophyll, photosynthesize in presence of light and produce food, while in dark *Euglena* is holozoic and behaves like an heterotroph.
36. *Gonyaulax* are red dinoflagellates that multiply rapidly and cause red tides.
39. Eubacteria are placed in Kingdom Monera.

42. Bacteria are grouped under four categories based on their shape – Bacilli, Cocci, Vibrio and Spirilla
43. Aplanospores – Endogenous  
Conidia – Exogenous



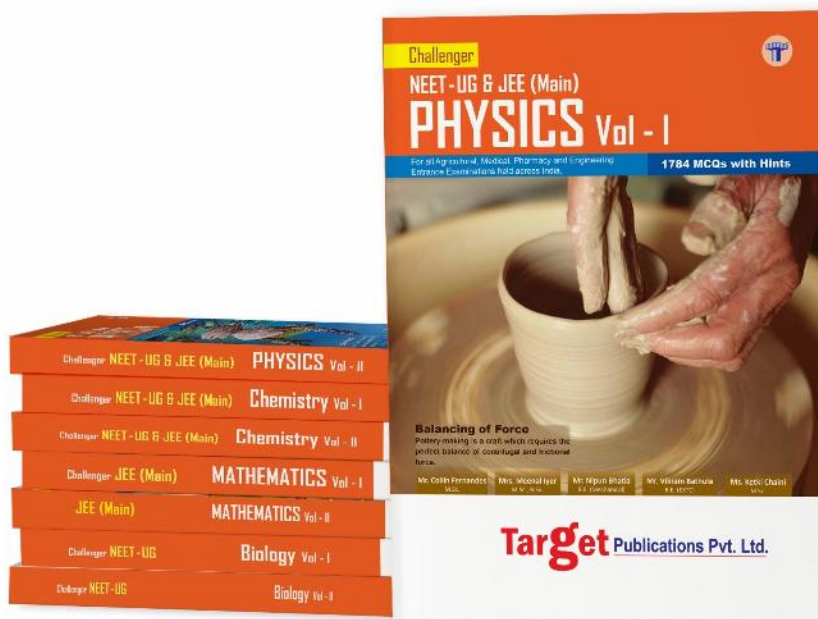
## Problems To Ponder

3.
  - i. *Penicillium* belongs to class Ascomycetes, rest belong to Phycomycetes.
  - ii. *Ustilago* belongs to class Basidiomycetes, rest belong to Ascomycetes.
  - iii. *Agaricus* belongs to class Basidiomycetes, rest belong to class Deuteromycetes.
  - iv. Bread mould (*Rhizopus*) belongs to class phycomycetes, rest belong to class Basidiomycetes.
5. In Phycomycetes, asexual reproduction takes place by zoospores.
6. Ascomycetes are saprophytic, decomposers, parasitic or coprophilous (growing on dung). Deuteromycetes are known as imperfect fungi.
7. The correct statements are:
  - ii. *Saccharomyces* is unicellular.
  - iii. Dikaryotic stage is commonly found in Basidiomycetes.
  - iv. Basidiospores are exogenously produced on the basidium.
9. Fig. I : *Nostoc* belongs to class Eubacteria of kingdom Monera.  
Fig. II : *Euglena* has a protein rich layer called pellicle which makes its body flexible.  
Fig. III : It is *Agaricus* which belongs to class Basidiomycetes  
Fig. IV : *Paramecium* is a member of ciliated protozoans.
11. Except Holozoic, all other modes of nutrition are exhibited by Kingdom Monera.



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