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11th Standard

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It gives me great pride and pleasure in bringing to you **Sura's Bio-Botany & Botany** guide for **11th Standard**. It is prepared as per the latest Syllabus. A deep understanding of the text and exercises is rudimentary to have an insight into the subject. The students have to carefully understand the topics and exercises.

Our guide encompasses all the requirements of the students to comprehend the text and the evaluation of the textbook.

It will be a teaching companion to teachers and a learning companion to students.

Our guide provides a precise and clear understanding of text and exercises from the examination perspective.

In order to learn effectively, I advise students to learn the subject sectionwise and practice the exercises given.

Though these salient features are available in our guide, I cannot negate the indispensable role of the teachers in assisting the student to understand the subject thoroughly.

I sincerely believe this guide satisfies the needs of the students and bolsters the teaching methodologies of the teachers.

I pray the almighty to bless the students for consummate success in their examinations.

Subash Raj, B.E., M.S.

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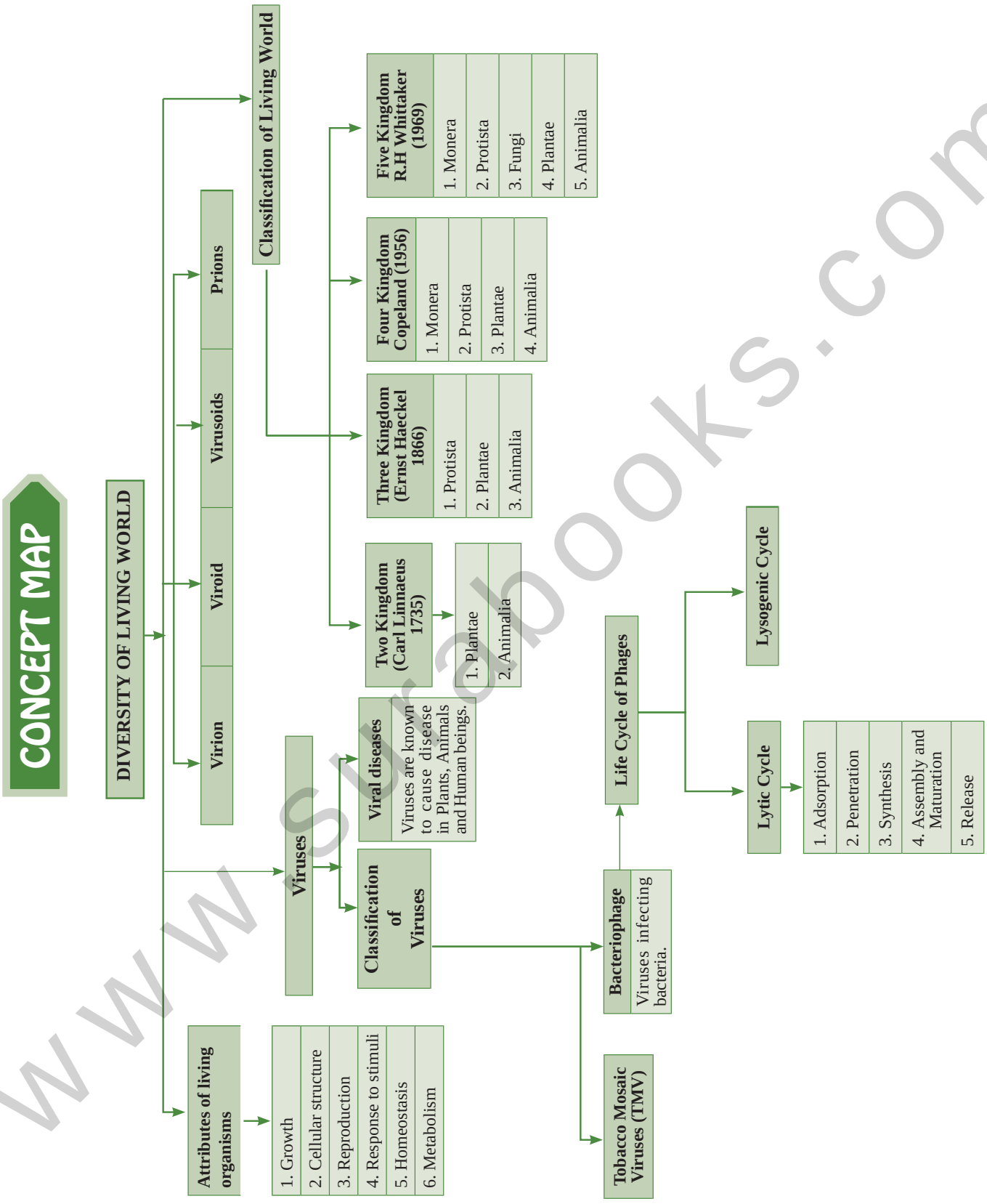
UNIT-I

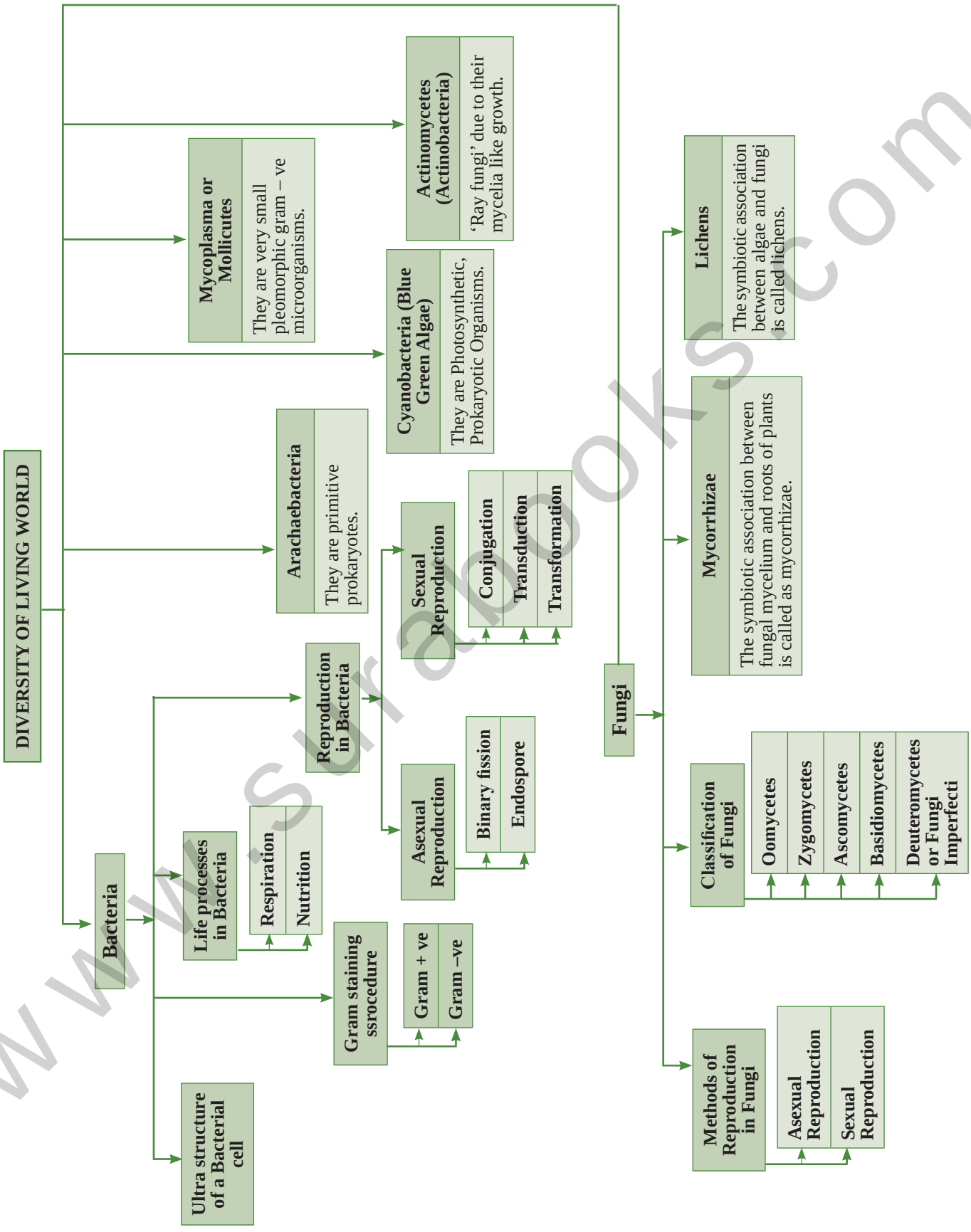
DIVERSITY OF LIVING WORLD

Chapter 1

LIVING WORLD

CHAPTER SNAPSHOT





MUST KNOW DEFINITIONS

Biosphere	:	Life on earth exists within a complex structure called **Biosphere.**
Growth	:	Growth is an intrinsic property of all living organisms through which they can increase cells both in number and mass.
Response to stimuli	:	All organisms are capable of sensing their environment and respond to various physical, chemical and biological stimuli.
Consciousness	:	Animals sense their surroundings by sense organs. This is called **Consciousness.**
Homeostasis	:	Property of self-regulation and tendency to maintain steady state within an external environment which is liable to change is called **Homeostasis.**
Metabolism	:	The sum total of all the chemical reactions taking aplace in a cell of living organism is called **metabolism.**
Cyclosis	:	The movement of cytoplasm is called **Cytoplasmic streaming** or **Cyclosis.**
Virology	:	The study of viruses is called **Virology.**
Viral genome	:	Each virus possess only one type of nucleic acid either DNA or RNA.
Deoxyviruses and Ribo Viruses	:	The virus possing DNA are called **"Deoxyviruses"** whereas those possing RNA are called **"Riboviruses"**.
TMV	:	**T**abacco **M**osaic **V**irus.
Bacteriophage	:	Viruses infecting bacteria are called Bacteriophages.
Prophage	:	The integrated phage DNA is called **Prophage.**
Virion	:	**Virion** is an intact infective virus particle which is non- replicating outside a host cell.
Viroid	:	**Viroid** is a circular molecule of ssRNA without a capsid.
Virusoids	:	They are the small circular RNAs which are similar to viroids.
Prions	:	They are the causative agents for about a dozen fatal degenerative disorders of the central nervous system of humans and other animals.
Cyanophages	:	Viruses infecting blue green algae are called **Cyanophages.**
Mycoviruses (or) Mycophages	:	The viruses attacking fungi are called **Mycoviruses** or **Mycophages.**
Nucleoid (or) Genophore	:	The genetic material is called **Nucleoid** or **Genophore** or **Incipient nucleus.**
Capnophilic Bacteria	:	Bacteria which require CO_2 for their growth are called as **Capnophillic Bacteria.**
Autotrophic Bacteria	:	Bacteria which can synthesis their own food are called **Autotrophic Bacteria.**
Transformation	:	Transfer of DNA from one bacterium to another is called **Transformation.**
Transduction	:	Phage mediated DNA transfer is called **Transduction.**
Generalized Transduction	:	The ability of a bacteriophage to carry genetic material of any region of bacterial DNA is called **Generalized transduction.**

Specialized (or) Restricted Transduction	:	The ability of the bacteriophage to carry only a specific region of the bacterial DNA is called **Specialised** or **Restricted transduction.**
Archaebacteria	:	They are primitive prokaryotes. They are mostly **Chemoautotrophs.**
Cyanobacteria	:	They are popularly called as **"Blue green algae"** (Cyanophyceae).
Mycoplasma or Mollicutes	:	They are very small, pleomorphic gram negative microorganisms.
Actinomycetes	:	Actinomycetes are also called 'Ray fungi' due to their mycelia like growth.
Mycology	:	The study of fungi is called **Mycology.**
Deuteromycetes or Fungi Imperfecti	:	The fungi belonging to this group lack sexual reproduction and are called **Imperfect fungi.**
Mycorrhizae	:	The symbiotic association between fungal mycelium and roots of plants is called as **mycorrhizae.**
Lichens	:	The symbiotic association between algae and fungi is called **Lichens.**
Phycobiont and Mycobiont	:	The algal partner is called **Phycobiont** or **Photobiont** and the fungal partner is called **Mycobiont.**
Ascolichen	:	The fungal partner of lichen belongs to ascomycetes, it is called **Ascolichen.**
Basidiolichen	:	The fungal partner of lichen belongs to basidiomycetes it is called **Basidiolichen.**

Evaluation

1. Which one of the following statement about virus is correct? *[Sep-2020]*

(a) Possess their own metabolic system.

(b) They are facultative parasites

(c) They contain DNA or RNA

(d) Enzymes are present

[Ans. (c) They contain DNA or RNA]

2. Identify the incorrect statement about the Gram positive bacteria *[Sep-2020]*

(a) Teichoic acid absent

(b) High percentage of peptidoglycan is found in cell wall

(c) Cell wall is single layered

(d) Lipopolysaccharide is present in cell wall

[Both (a) and (d) are the incorrect statements]

3. Identify the Archaebacterium

(a) *Acetobacter*

(b) *Erwinia*

(c) *Treponema*

(d) *Methanobacterium*

[Ans. (d) *Methanobacterium*]

4. The correct statement regarding Blue green algae is *[Mar-2020]*

(a) lack of motile structures

(b) presence of cellulose in cell wall

(c) absence of mucilage around the thallus

(d) presence of floridean starch

[Ans. (a) lack of motile structures]

5. Identify the correctly matched pair

(a)	Actinomycete	-	(a) Late blight
(b)	Mycoplasma	-	(b) Lumpy jaw
(c)	Bacteria	-	(c) Crown gall
(d)	Fungi	-	(d) Sandal spike

[Ans. (c) Bacteria-Crown gall]

6. Differentiate homoiomerous and heteromerous lichens. *[HY-2018]*

Ans.

Homoiomerous Lichens	Heteromerous Lichens
Algal cells are evenly distributed in the thallus.	A distinct layer of algae and fungi present in the thallus.

7. Write the distinguishing features of monera. *[Mar-2020]*

Ans.

1. They are prokaryotic organisms.
2. Cell wall is present and made of peptidoglycan and mucopeptides.
3. They are unicellular. Eg : Cyanobacteria, Mycoplasma.

8. Why do farmers plant leguminous crops in crop rotations/mixed cropping?

Ans.

1. The bacteria *rhizobium* forms root nodules in the leguminous crops only and lives in symbiotic association with the plant.
2. They help to convert atmospheric nitrogen to nitrate salts in the soil thereby adding to soil fertility.
3. Hence growing leguminous crops in crop rotations / mixed cropping helps to maintain fertility of the soil.

9. Briefly discuss on five kingdom classification. Add a note on merits and demerits. *[Sep-2020]*

Ans. R.H.Whittaker proposed five kingdom classification in the year 1969.

Kingdoms :

	Cell type	Level of organization	Cell wall
Monera	Prokaryotic	Unicellular	Present (made up of Peptidoglycan and Mucopeptides)
Protista	Eukaryotic	Unicellular	Present in some (made up of cellulose), absent in others
Fungi	Eukaryotic	Tissue/organ	Present (made up of chitin or cellulose)
Plantae	Eukaryotic	Tissue/organ	Present (made up of cellulose)
Animalia	Eukaryotic	Tissue/organ/ organ system	absent

Merits :

1. Classification is based on the complexity of cell structure and organization of thallus.
2. Based on the mode of nutrition.
3. Separation of fungi from plants.
4. Shows the phylogeny of the organisms.

Demerits :

1. Monera and protista accommodate both autotrophic and heterotrophic organisms, cell wall lacking and cell wall bearing organisms thus making these two groups more heterogeneous.
2. Viruses not included in the system.

10. Give a general account on lichens. *[Mar-2020]*

Ans. 1. The symbiotic association between algae and fungi is called **lichens**.

2. The algal partner is called **phycobiont**, and the fungal partner is called **mycobiont**.
3. Algae provide nutrition for fungal partner and fix the thallus to the substratum through **rhizinae**. They reproduce by akinetes, aplanospore etc., Mycobionts produce **ascocarps** during sexual reproduction.

Classification :

1. **Based on the habitat** :
   - **(i)** Corticolous (on Bark)
   - **(ii)** Lignicolous (on Wood)
   - **(iii)** Saxicolous (on Rocks)
   - **(iv)** Terricolous (on Ground)
2. **Based on morphology :**
   - **(i)** Leprose (a distinct fungal layer is absent)
   - **(ii)** Crustose - Crust like
   - **(iii)** Foliose - Leaf like
   - **(iv)** Fruticose - Branched pendulous shrub like
3. **Based on algal cells distribution :**
   - **(i)** Homoiomerous - Algal cells evenly distributed in the thallus.
   - **(ii)** Heteromerous - Distinct layer of algae and fungi present.
4. **Based on fungal partner:**
   - **(i)** Ascolichen - Fungal partner is a ascomycete.
   - **(ii)** Basidiolichen - Fungal partner is a schizomycetes.

Economic importance :

1. Lichens secrete organic acids like **Oxalic acids**, helps in weathering of rocks, they act as pioneers in Xerosere.
2. Sensitive to air pollutants (sulphur-di oxide) and considered as pollution indicators.
3. **Usnic acid** produced from lichens show antibiotic properties.
4. Dye present in litmus paper (acid base indicator in labs) is got from *Roccella montagnei*.

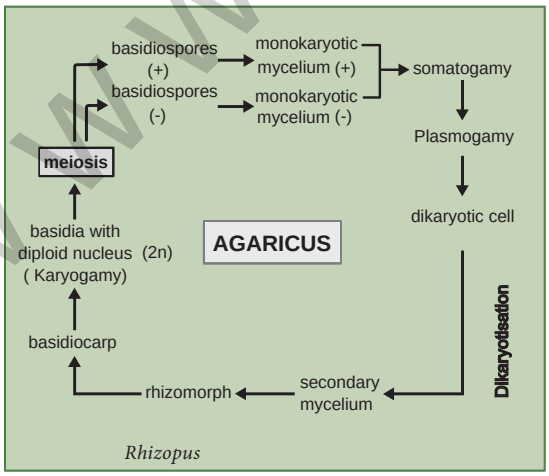
Botany Long Version Questions (for pure science Group)

Long Version Evaluation

Q.No. 1 to 10 Refer Evaluation.

11. Write outline the life cycle of *Agaricus*.

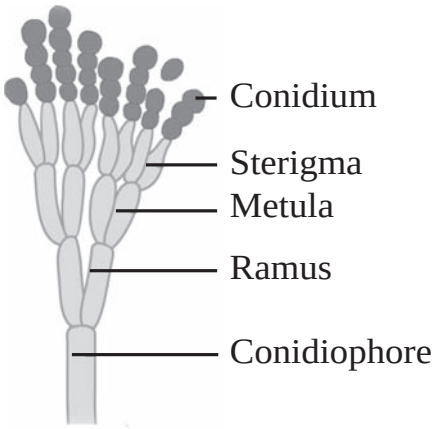
Ans.



Life Cycle of *Agaricus*

12. What is Sterigma?

Ans. Sterigmata is a small stalk that bears a conidia.



Conidia formation - *Penicillium*

13. Name the types of mycelium found in *Agaricus*.

Ans. The thallus is made up of branched structures called **hyphae**. A large number of hyphae constitute the mycelium.

Types of mycelium:

1. **Primary mycelium:** The primary mycelium develops from the germination of basidiospore. It is septate, uninucleate and haploid. It is also called **monokaryotic mycelium.**
2. **Secondary mycelium:** Fusion of two primary mycelium of opposite strains give rise to secondary mycelium or **dikaryotic mycelium**. The dikaryotic mycelium develops into hyphal cords called **Rhizomorphs**. and perennates the soil for a long period.
3. **Tertiary mycelium:** The tertiary mycelium is found in the fruit body called **basidiocarp**. Each cell of the hyphae posssess a cell wall made up of chitin and cell organelles like mitochondria, golgibodies, Endoplasmic reticulum etc., are also present.

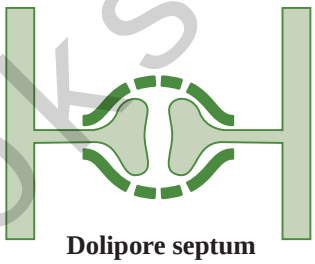
14. Differentiate oidium and Chlamydospore.

Ans.

No.	Oidium	Chlamydospore
1.	The hypha divide and develop into spores are called **oidia** or **oidium**.	Thick walled resting spores are called **chlamydospores**.
2.	Produced by asexual reproduction Eg: *Erysiphe*	Produced by asexual reproduction Eg: *Fusarium*

15. Name the fungal group which possess dolipore septum.

Ans. *Basidiomycetes* is the fungal which possess dolipore septum.



Dolipore septum

16. Mention the diseases caused by fungi in plants.

Ans.

No.	Name of the disease	Causal organism
1.	Blast of Paddy	*Magnaporthe grisea*
2.	Red rot of sugarcane	*Colletotrichum falcatum*
3.	Anthracnose of Beans	*Colletotrichum lindemuthianum*
4.	White rust of crucifers	*Albugo candida*
5.	Peach leaf curl	*Taphrina deformans*
6.	Rust of wheat	*Puccinia graminis tritici*

17. Give two examples for mycorrhizae forming fungi.

Ans. 1. *Pisolithus tinctorius*
2. *Oidiodendron*
3. *Gigaspora*

18. Differentiate Gram positive and Gram negative bacteria.

Ans.

No.	Characteristics	Gram positive Bacteria	Gram negative Bacteria
1.	Cell wall	Thick layered with 0.015µm-0.02µm	Thin layered with 0.0075µm–0.012µm thick
2.	Rigidity of cell wall	Rigid due to presence of Peptidoglycans	Elastic due to presence of lipoprotein-polysaccharide mixture
3.	Chemical composition	Peptidoglycans-80% Polysaccharide-20% Teichoic acid present	Peptidoglycans-3 to 12% rest is polysaccharides and lipoproteins. Teichoic acid absent
4.	Outer membrane	Absent	Present
5.	Periplasmic space	Absent	Present
6.	Susceptibility to penicillin	Highly susceptible	Low susceptible
7.	Nutritional requirements	Relatively complex	Relatively simple
8.	Flagella	Contain 2 basal body rings	Contain 4 basal body rings
9.	Lipid and lipoproteins	Low	High
10.	Lipopolysaccharides	Absent	Present 2

GOVERNMENT EXAM QUESTIONS

Bio-Botany (Short version)

CHOOSE THE CORRECT ANSWERS 1 MARK

1. Who had defined the infectious agent in tobacco leaves as contagium vivum Fluidum? *[Firt Mid-2018]*

(a) Dimitry Ivanowsky (b) M.W. Beijierink
(c) F.W. Twort (d) Edward Jenner

[Ans. (b) M.W. Beijierink]

2. Which one of the following is not the characteristic feature of cyanobacteria? *[Govt. MQP-2018]*

(a) they are multicellular
(b) they form colonies
(c) they form blooms in polluted water bodies
(d) they can fix atmospheric nitrogen

[Ans. (a) they are multicellular]

1. Approximate number of capsomeres in TMV is _____. *[QY-2018]*

(a) 3120 (b) 1203
(c) 2130 (d) 3021 **[Ans. (c) 2130]**

2. Fusion of both morphologically and physiologically dissimilar gametes called _____ *[QY-2018]*

(a) Isogamy (b) Anisogamy
(c) Oogamy (d) Syngamy

[Ans. (b) Anisogamy]

3. The integrated phage DNA is called _____. *[HY-2018]*

(a) prophage (b) bacteriophage
(c) cyanophage (d) mycophage

[Ans. (a) prophage]

4. The two subunits of ribosomes remain united at critical ion level of: *[June-2019]*

(a) Magnesium (b) Calcium
(c) Sodium (d) Ferrous

[Ans. (a) Magnesium]

5. Match the following and choose the correct answer *[QY-2019]*

	List I		List II
A	Athlete's foot	i	Viral disease
B	Diphtheria	ii	Protozoic disease
C	Rabies	iii	Bacterial disease
D	Amoebic dysentry	iv	Fungal disease

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

[Ans. (b) A (iv), B (iii), C (i), D (ii)]

6. Match the following : *[HY-2019]*

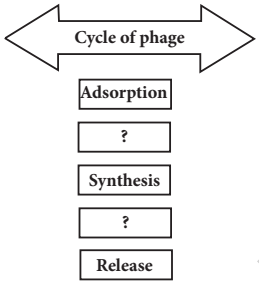
	List I		List II
(1)	Green Sulphur Bacteria	(i)	Chromatium
(2)	Purple Sulphur Bacteria	(ii)	Methano bacterium
(3)	Purple Non-Sulphur Bacteria	(iii)	Chlorobium
(4)	Archae Bacteria	(iv)	Rhodopirillum

(a) (1)-(i), (2) - (ii), (3) - (iii), 4 - (iv)
(b) (1)-(ii), (2) - (iii), (3) - (iv), 4 - (i)
(c) (1)-(iii), (2) - (i), (3) - (iv), 4 - (ii)
(d) (1)-(iv), (2) - (i), (3) - (ii), 4 - (iii)

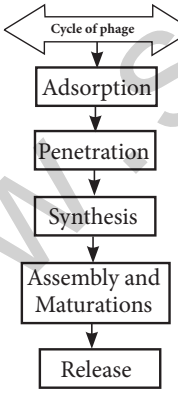
[Ans. (c) (1)-(iii), (2) - (i), (3) - (iv), 4 - (ii)]

Very Short Answers — 2 MARKS

1. Complete the Multiplication cycle of Phage *[Govt. MQP-2018]*



Ans.



2. What are prions? Name one human diseases and cattle disease caused by prions. *[First Mid-2018]*

Ans. Prions are proteinaceous infectious particles.

Disease caused by prions:

In humans - several disorders of central nervous system.

Cattle disease:

Mad cow disease and scrapie disease in sheep.

3. What is Virion? (or) Define Virion. *[QY-2018]*

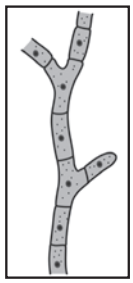
Ans. **Virion** is an intact infective virus particle which is non-replicating outside a host cell.

4. A few hours after taking food, a person feels hungry. Name the metabolic activity that is responsible for this. Justify your answer. *[QY-2019]*

Ans. Metabolism activity responsible for this is catabolism. It is breaking down process from larger molecule into smaller units. The stored chemical energy is released and used so the person feels hungry.

Short Answers — 3 MARKS

1. Refer the diagram of septate mycelium given. With that reference draw coenocytic mycelium. *[Govt. MQP-2018]*



Ans.

Coenocytic mycelium

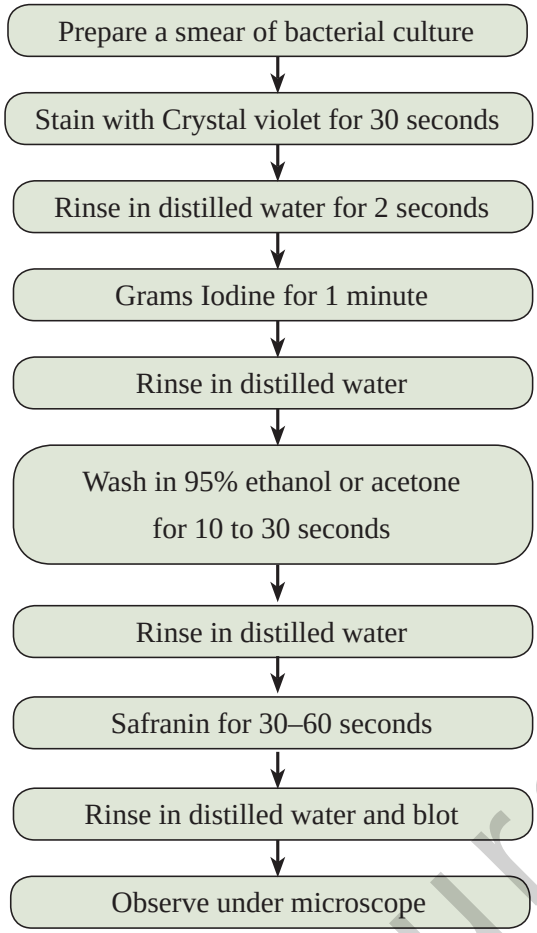
2. Do you agree that virus is living organism? If you say yes, justify your answer. *[June-2018]*

Ans. No. Virus is non-living organism. They exhibit characteristics of living organisms when they are occupying a living cell (host organism).

Long Answers 5 MARKS

1. Write the steps involved in Gram staining Bacteria. *[QY-2018]*

Ans.



1. (i) A Danish Physician, Christian Gram developed a staining procedure to differentiate bacteria. List the various steps involved in that procedure.

(ii) Distinguish between Deoxy viruses and Ribo viruses with example. *[March-2019]*

Ans. **i) Gram staining Techniques :**

1. Prepare a smear of bacterial culture .
2. Stain with crystal violet for 30 seconds .
3. Rinse in distilled water for 2 seconds .
4. Grams Iodine for 1 minute .
5. Rinse in distilled water.
6. Wash in 95% ethanol or acetone for 10 to 30 seconds.
7. Rinse in distilled water 8. Safranin for 30-60seconds 9. Rinse in distilled water and blot 10. Observe under microscope.

ii) Distinguish between Dexoy viruses and Ribo viruses :

	Dexoy viruses	Ribo viruses
1	The viruses possessing DNA	Viruses possessing RNA
2	Ex: Majority of animal viruses	Ex: Majority Plant viruses
3	(OR) Cauliflower Mosaic virus	(OR) HIV viruses

2. Write the steps involved during the phage multiplication in which the disintegration of host bacterial cell occurs. Draw a diagram. *[QY-2019]*

Ans. **Lytic Cycle :** During lytic cycle of the phage the disintegration of host bacterial cell occurs and the progeny virions are released The steps are:

1. Adsorption :

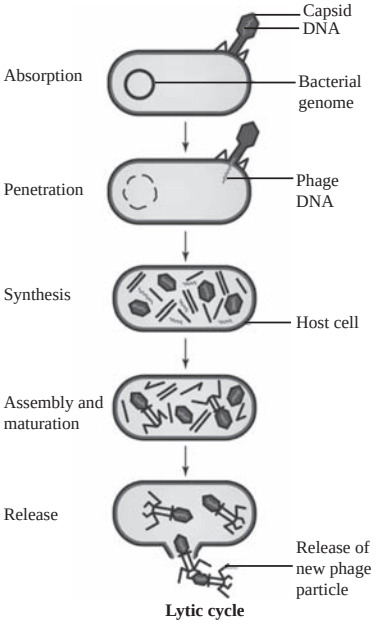
(i) Phage (T_4) particles interact with cell wall of host ***(E.coli).***

(ii) The phage tail makes contact between the two, and tail fibres recognize the specific receptor sites present on bacterial cell surface.

(iii) The lipopolysaccharides of tail fibres act as receptor in phages.

(iv) The process involving the recognition of phage to bacterium is called **landing.**

(v) Once the contact is established between tail fibres and bacterial cell, tail fibres bend to anchor the pins and base plate to the cell surface. This step is called **pinning.**



Lytic cycle

2. Penetration :

(i) This process involves mechanical and enzymatic digestion of the cell wall of the host. At the recognition site phage digests certain cell wall structure by viral enzyme (lysozyme).

(ii) After pinning the tail sheath contracts (by using ATP energy) and appears shorter and thicker.

(iii) The base plate through the centre enlarges after contraction of sheath. Thereafter DNA is injected into the cell wall without requiring metabolic energy.

(iv) Such an empty protein coat leaving the outside cell is known as **'ghost'.**

3. Synthesis :

(i) Degradation of bacterial chromosome,

(ii) Protein synthesis and

(iii) DNA replication.

The phage nucleic acid takes over the host biosynthetic machinery. Host DNA gets inactivated and breaks down. Phage DNA suppresses the synthesis of bacterial protein and directs the metabolism of the cell to synthesis the proteins of the phage particles and simultaneously replication of phage DNA also takes place.

4. Assembly and Maturation :

(i) DNA of the phage and protein coat are synthesized separately, assembled to form phage particles.

(ii) This assembling process of the phage particles is known as **maturation**.

(iii) After 20 min of infection about 300 new phages are assembled.

5. Release :

(i) Maturation of phage particles starts and accumulate inside the host cell.

(ii) The phage particles are released by the lysis of host cell wall.

3. Explain sexual reproduction in Bacteria.

Ans. **Sexual Reproduction in Bacteria:** *[HY-2019]*

Typical sexual reproduction involving the formation and fusion of gametes is absent in bacteria. However gene recombination can occur in bacteria by three different methods. They are:

(i) Conjugation

(ii) Transformation

(iii) Transduction

(i) Conjugation

1. J. Lederberg and Edward L. Tatum demonstrated conjugation in E. coli. in the year 1946.

2. In this method of gene transfer the donor cell gets attached to the recipient cell with the help of pili.

3. The pilus grows in size and forms the conjugation tube.

4. The plasmid of donor cell which has the F+ (fertility factor) undergoes replication.

5. Only one strand of DNA is transferred to the recipient cell through conjugation tube.

6. The recipient completes the structure of double stranded DNA by synthesizing the strand that complements the strand acquired from the donor.

(ii) Transformation:

1. Transfer of DNA from one bacterium to another is called transformation.

2. In 1928 the bacteriologist Frederick Griffith demonstrated transformation in Mice using Diplococcus pneumoniae.

3. Two strains of this bacterium are present. One strain produces smooth colonies and are virulent in nature (S type) In addition another strain produced rough colonies and are avirulent (R type).

4. When S-type of cells were injected into the mouse, the mouse died. When R-type of cells were injected, the mouse survived.

5. He injected heat killed S-type cells into the mouse the mouse did not die.

6. When the mixture of heat killed S-type cells and R-type cells were injected into the mouse. The mouse died.

7. The avirulent rough strain of Diplococcus had been transformed into S-type cells.

8. The hereditary material of heat killed S-type cells had transformed R-type cell into virulent smooth strains.

9. Thus the phenomenon of changing the character of one strain by transferring the DNA of another strain into the former is called Transformation.

(iii) Transduction:

Zinder and Lederberg (1952) discovered Transduction in Salmonella typhimurum. Phage mediated DNA transfer is called Transduction.

Transduction is of two types:

(i) Generalized transduction

(ii) Specialized or Restricted transduction.

(i) Generalized Transduction:

The ability of a bacteriophage to carry genetic material of any region of bacterial DNA is called generalised transduction.

(ii) Specialized or Restricted Transduction:

The ability of the bacteriophage to carry only a specific region of the bacterial DNA is called specialized or restricted transduction.

Botany (Long version)

Very Short Answers — 2 MARKS

1. What is Archaebacteria? Name any two bacterial plant diseases. *[Mar-2020]*

Ans. **Archaebacteria:**

Archaebacteria are primitive prokaryotes and are adapted to thrive in extreme environments like hot springs, high salinity, low pH and so on. They are mostly chemoautotrophs.

1. Bacterial blight
2. Fire blight

Short Answers — 3 MARKS

1. What are Magnetosomes? *[Mar-2020]*

Ans.
1. Intracellular chains of 40 - 50 magnetite (Fe_3O_4) particles found in bacterium - ***Aquaspirillum magnetotacticum.***
2. Helps the bacterium to locate nutrient rich sediments.

2. What is Fimbriae or Pili? *[Mar-2020]*

Ans.
1. Pili or Fimbriae are hair like appendages found on surface of cell wall of gram-negative bacteria Eg: ***Enterobacterium.***
2. The pili are 0.2 to 20 µm long with a diameter of about 0.025µm .
3. In addition to normal pili there are special type of pili which help in conjugation called sex pili are also found.

Long Answers — 5 MARKS

1. Write a note on economic importance of bacteria. *[Sep-2020]*

Ans.

No.	Beneficial aspects	Bacteria	Role
1.	**Soil fertility**		
	Ammonification	*Bacillus ramosus*	Convert complex proteins in the dead bodies of plants and animals into ammonia which is later converted into ammonium salt.
2.	**Antibiotics**		
	Chloromycetin	*Streptomyces venezuelae*	Cures typhoid fever.
3.	**Industrial use**		
	a) Cheese	*Lactobacillus lactis*	Convert milk to cheese.
	b) Vitamins	*Escherichia coli*	Produces Vitamin K and vitamin B complex in human intestine.
4.	**Curing of Tea and Tobacco**	*Bacillus megatherium*	Adding special flavour and aroma to tea and tobacco leaves by fermentation.
5.	**Diseases**		
	a) Bacterial blight	*Xanthomonas oryzae*	Affects rice crop.
	b) Cholera	*Vibrio cholerae*	Affects human beings.
	c) Anthrax	*Bacillus anthracis*	Affects sheep.

Additional

Choose the Correct Answers — 1 MARK

I. Choose the correct options for the below Questions:

1. Identify the criteria not used for classification of viruses?

(a) –ss or – ds (b) Use of RT (c) (+) RNA or (–) RNA (d) Reproduction

[Ans. (d) Reproduction]

2. Which feature do not possess by Basidiomycetes?
(a) Clamp connection
(b) Club Fungi
(c) Dolipore septum
(d) Lack sexual reproduction
[Ans. (d) Lack sexual reproduction]

3. Which gram negative bacterium caused duodenal and gastric ulcers?
(a) *Helicobacter Pylori*
(b) *Helicobacter Vibrio*
(c) *E.Coli*
(d) *Haemophillus* **[Ans. (a) *Helicobacter Pylori*]**

4. Which one of the following bacterium can cause crown gall disease in plants?
(a) *Bacillus*
(b) *Clostridium*
(c) *Agrobacterium tumefaciens*
(d) *E.Coli* **[Ans. (c) *Agrobacterium tumefaciens*]**

5. Which one of the following is a rod-shaped bacteria?
(a) *Coccus* (b) *Bacillus*
(c) *Spirillum* (d) *Vibrio*
[Ans. (b) *Bacillus*]

6. Who discovered the transformation process?
(a) Griffith (b) Ehrenberg
(c) Pasteur (d) Hooke
[Ans. (a) Griffith]

7. Which of the following is called 'true bacteria'?
(a) Archaebacteria (b) Eubacteria
(c) *Methanobacterium* (d) *Halobacterium*
[Ans. (b) Eubacteria]

8. Which is the fastest growing cyanobacteria?
(a) *Halobacterium* (b) *Methanobacterium*
(c) *Spirulina* (d) *Thermoprotens*
[Ans. (c) Spirulina]

9. Which one of the following organisms completely lacks a cell wall?
(a) Eubacteria (b) Archaebacteria
(c) Fungi (d) Mycoplasma
[Ans. (d) Mycoplasma]

10. Who introduced the Gram staining method?
(a) Bergy (b) Christian Gram
(c) Ehrenberg (d) Lederberg
[Ans. (b) Christian Gram]

11. Who discovered plasmid ?
(a) David (b) Koch
(c) Joshua Lederberg (d) Griffith
[Ans. (c) Joshua Lederberg]

12. Who is the Father of Indian Mycology?
(a) P.A. Micheli (b) Sir Edwin John Butler
(c) Blackley (d) Raper
[Ans. (b Sir Edwin John Butler)]

II. Choose the Correct options for the below Fill in the blanks:

13. Earth was formed _____ billion years ago.
(a) 4.6 (b) 5.5 (c) 4 (d) 3
[Ans. (a) 4.6]

14. A virus with dsDNA is called as _____.
(a) Parvo viruses (b) Toga viruses
(c) Adeno viruses (d) Retro viruses
[Ans. (c) Adeno viruses]

15. _____ is a sexual method of reproduction.
(a) Binary fission (b) Budding
(c) Conidia (d) Gametangial contact
[Ans. (d) Gametangial contact]

16. Vaccination for small pox was discovered by ____.
(a) d' Herelle (b) Edward Jenner
(c) Robert Gallo (d) F.W. Twort
[Ans. (b) Edward Jenner]

17. 1 Nanometer =_____.
(a) 10^{9} meter (b) 10^{-9} meters
(c) 10^{8} meters (d) 10^{-6} meters
[Ans. (b) 10^{-9} meters]

18. Size of TMV =_____.
(a) 300 × 200 nm (b) 30 × 20 nm
(c) 300 × 20 nm (d) 280 × 40 nm
[Ans. (c) 300 × 20 nm]

19. Viruses were classified into seven classes by _____.
(a) David Baltimore (b) Twort
(c) Ehrenberg (d) Alexopoulos
[Ans. (a) David Baltimore]

20. TMV has a molecular weight of _____Daltons.
(a) 39×10^{6} (b) 38×10^{5}
(c) 39×10^{7} (d) 39×10^{10}
[Ans. (a) 39×10^{6}]

21. **TMV has approximately _____capsomeres.**
(a) 2030 (b) 2130
(c) 2330 (d) 2000 **[Ans. (b) 2130]**

22. **Mad cow disease is caused by _____.**
(a) Prions (b) Virion
(c) Viroid (d) Phage
[Ans. (a) Prions]

23. **_____is considered to be a new kindgom.**
(a) Protista (b) Chromista
(c) Monera (d) Plantae
[Ans. (b) Chromista]

24. **The classification published in recent times was given by _____.**
(a) Carl Woese (b) Ruggerio *et al*
(c) Whittaker (d) Copeland
[Ans. (b) Ruggerio *et al*]

25. **Founder of modern Bacteriology_____.**
(a) Koch (b) Griffith
(c) Lederberg (d) Gram**[Ans. (a) Koch]**

26. **Bacteria was first discovered by a _____ scientist.**
(a) German (b) Dutch
(c) French (d) American
[Ans. (b) Dutch]

27. **_____ are obligate aerobes.**
(a) *Streptococcus* (b) *Clostridium*
(c) *Micrococcus* (d) *E. Coli*
[Ans. (c) *Micrococcus*]

28. **Griffith demonstrated transformation in _____.**
(a) 1928 (b) 1930
(c) 1975 (d) 1900 **[Ans. (a) 1928]**

29. **Food poisoning is caused by _____.**
(a) *Yersinia* (b) *Clostridium*
(c) *Treponema* (d) *Vibrio*
[Ans. (b) *Clostridium*]

30. **_____ was awarded a Nobel prize for his work on TMV.**
(a) Jenner (b) Mayer
(c) W.M. Stanley (d) Robert Gallo
[Ans. (c) W.M. Stanley]

31. **_____ shows cuboid symmetry.**
(a) TMV (b) Bacteriophage
(c) Herpes virus (d) Influenza
[Ans. (c) Herpes virus]

32. **The base plate of T_4 phage has _____ tail fibres.**
(a) 5 (b) 4 (c) 6 (d) 8
[Ans. (c) 6]

33. **Lysozyme is secreted by phage during _____ .**
(a) Adsorption (b) Synthesis
(c) Penetration (d) Maturation
[Ans. (c) Penetration]

34. **_____ is a capnophilic bacteria.**
(a) *Campylobacter* (b) *Chlorobium*
(c) *Chromatium* (d) *Clostridium*
[Ans. (a) *Campylobacter*]

35. **_____is a disease affecting animals.**
(a) Scab (b) Anthrax
(c) Ring rot (d) Canker
[Ans. (b) Anthrax]

36. **_____is found in corolloid roots of *Cycas*.**
(a) *Dermacarpa* (b) *Nostoc*
(c) *Scytonema* (d) *Chara*
[Ans. (b) *Nostoc*]

37. **A marine cyanobacterial species_____.**
(a) *Trichodesmium* (b) *Gloeocapsa*
(c) *Nostoc* (d) *Cycas*
[Ans. (a) *Trichodesmium*]

38. **The organisms isolated from pleural fluid of cattle _____.**
(a) Actinomycetes (b) Virus
(c) Phage (d) Mycoplasma
[Ans. (d) Mycoplasma]

39. **Nitrogen fixation in non leguminous plants is done by_____.**
(a) *Rhizobium* (b) *Alnus*
(c) *Frankia* (d) *Streptomyces*
[Ans. (c) *Frankia*]

40. **_____is considered as founder of mycology.**
(a) P.A. Micheli (b) Webster
(c) Blackley (d) Ainsworth
[Ans. (a) P.A. Micheli]

41. **Spermatization is a sexual mode of reproduction in _____.**
(a) *Rhizopus* (b) *Neurospora*
(c) *Ascomycetes* (d) *Penicillium*
[Ans. (b) *Neurospora*]

42. **Sac fungi refers to_____.**
(a) Ascomycetes (b) Zygomycetes
(c) Basidiomycetes (d) Deuteromycetes
[Ans. (a) Ascomycetes]

43. **A plant growth promoter got from fungi is _____.**
(a) Rennet (b) Gibberellin
(c) Ergot (d) Griseofulvin
[Ans. (b) Gibberellin]

44. **Monotropa derives nutrition by_____.**
(a) Root Nodules (b) Lichens
(c) Mycorrhizae (d) Roots
[Ans. (c) Mycorrhizae]

45. **_____are considered as pollution indicators.**
(a) Mycorrhiza (b) Actinomycete
(c) Lichens (d) Cyanobacteria
[Ans. (c) Lichens]

46. **Living organisms constitute _____ .**
(a) Living world (b) Non-living world
(c) Animal kingdom (d) Plant kingdom
[Ans. (a) Living world]

47. **Living thing is otherwise called as _____ .**
(a) Organ (b) Organelle
(c) Organism (d) Cell
[Ans. (c) Organism]

48. **Living things are made of _____ .**
(a) Organisms (b) Atoms
(c) Organs (d) Cells **[Ans. (d) Cells]**

49. **Sum total of constructive reactions is called as _____ .**
(a) Anabolism (b) Catabolism
(c) Metabolism (d) Embolism
[Ans. (a) Anabolism]

50. **Sum total of destructive reactions is called as _____.**
(a) Metabolism (b) Catabolism
(c) Embolism (d) Anabolism
[Ans. (b) Catabolism]

51. **A multicellular organism grows by _____ .**
(a) budding (b) cell division
(c) fission (d) spore formation
[Ans. (b) cell division]

52. **Growth in plant is _____ .**
(a) Diffusable (b) Unlocalized
(c) Limited (d) Life long
[Ans. (d) Life long]

53. **Organisms grow by _____ .**
(a) cell division
(b) spore formation
(c) fragmentation
(d) vegetative propagation **[Ans. (a) cell division]**

54. **Increase in body mass is considered as _____ .**
(a) cell division (b) homeostasis
(c) reproduction (d) growth
[Ans. (d) growth]

55. **_____ do not grow.**
(a) Living organisms (b) Microorganisms
(c) Dead organisms (d) All the above
[Ans. (c) Dead organisms]

56. **_____ multiply and spread very fast by producing millions of asexual spores.**
(a) Bacteria (b) Pteridophytes
(c) Fungi (d) Sea weeds
[Ans. (c) Fungi]

57. **Some fungi, filamentous algae and the protonema of mosses multiply by _____ .**
(a) fission (b) fertilization
(c) pollination (d) fragmentation
[Ans. (d) fragmentation]

58. **Yeast and *Hydra* reproduce by _____ .**
(a) Budding (b) Fission
(c) Spore formation
(d) Vegetative propagation **[Ans. (a) Budding]**

59. **_____ is the building block of all living things.**
(a) Cells (b) Organs
(c) Atoms (d) Compounds
[Ans. (a) Cells]

60. **_____ is a basic unit of life.**
(a) Atoms (b) Compounds
(c) Soils (d) Cell **[Ans. (d) Cell]**

61. **Detection of changes in their living place by organisms is called _____ .**
(a) Interactions (b) Consciousness
(c) Autotropic (d) Meterotropic
[Ans. (b) Consciousness]

62. **Bacteriophage varies in size from _____ .**
(a) 10-100nm (b) 1-10nm
(c) 50-500nm (d) 20-40nm
[Ans. (a) 10-100nm]

63. **Viruses that cause diseases in fungi are called _____ .**
(a) Cyanophages (b) Bacteriophages
(c) Lactophages (d) Mycophages
[Ans. (d) Mycophages]

64. **Virus that infects bacteria is called _____ .**
(a) Mycophage (b) Lactophage
(c) Bacteriophage (d) Cyanophage
[Ans. (c) Bacteriophage]

65. **The cancer causing viruses are also called _____ .**
(a) Oncogenic viruses (b) Corona viruses
(c) HIV (d) Mycoviruses
[Ans. (a) Oncogenic viruses]

66. **The term bacteria was first used by _____ .**
(a) Stanley (b) Pasteur
(c) Hooke (d) Ehrenberg
[Ans. (d) Ehrenberg]

67. **Bacterial cell wall contains _____ .**
(a) peptidoglycan (b) glucose
(c) flagellin (d) chitin
[Ans. (a) peptidoglycan]

68. **_____ is a thermophilic gram negative bacteria.**
(a) *Rhizobium* (b) *Salmonella*
(c) *Pseudomonas* (d) *Thermus aquaticus*
[Ans. (d) *Thermus aquaticus*].

69. **Actinomycetes are also called _____**
(a) Ray fungi (b) Liverworts
(c) Hyphae (d) Pileus
[Ans. (a) Ray fungi]

70. **Extra chromosomal self-replicating DNA segments called _____ .**
(a) CDNA (b) rDNA
(c) Plasmid (d) RNA
[Ans. (c) Plasmid]

71. **An example of photoautotrophic bacteria is ____ .**
(a) *Nitrosomonas* (b) *Nitrobacter*
(c) *Chlorobium* (d) *Spirillum*
[Ans. (c) *Chlorobium*]

72. **A bacterial cell is covered by _____ .**
(a) glycocalyx (b) flagellin
(c) chitin (d) peptidoglycan
[Ans. (a) glycocalyx]

73. **Disease causing organisms are called as _____ .**
(a) organisms (b) pathogens
(c) recipients (d) decomposers
[Ans. (b) pathogens]

74. **Bacterial photosynthesis differs from higher plants in evolution of _____ .**
(a) Oxygen (b) Hydrogen sulphide
(c) Hydrogen (d) CO_2
[Ans. (a) Oxygen]

75. **The study of Bacteria is called _____ .**
(a) Virology (b) Mycology
(c) Physiology (d) Bacteriology
[Ans. (d) Bacteriology]

76. **Bacteria were first discovered by _____ .**
(a) Ehrenberg (b) Leeuwenhoek
(c) Koch (d) Bergy
[Ans. (b) Leeuwenhoek]

77. **Dermatophytes are fungi which cause infection in the _____ .**
(a) head (b) foot
(c) skin (d) nail **[Ans. (c) skin]**

78. **_____ is the branch of science that deals with the study of fungi.**
(a) Phycology (b) Oncology
(c) Mycology (d) Psychology
[Ans. (c) Mycology]

79. **The fungal cell wall is made up of _____ .**
(a) cellulose (b) peptidoglycan
(c) pectin (d) chitin
[Ans. (d) chitin]

80. **A completely closed ascocarp is called _____ .**
(a) cleistothecium (b) perethecium
(c) apothecium (d) pseudothecium
[Ans. (a) cleistothecium]

81. **_____ is a edible fungus.**
(a) Aspergillus (b) Claviceps
(c) Agaricus (d) Penicillium
[Ans. (c) Agaricus]

III. Identify the correct Statements:

1. **Identify the correct statements from the below about "Gram negative bacteria".**
(I) Thin layered with 0.0075 µm - 0.012 µm thick.
(II) Rigid due to presence of peptidoglycans.
(III) Elastic due to presence of lipoprotein-polysaccharide mixture.

(IV) Contain 4 basal body rings.

(a) I, II and III only (b) I, III and IV only
(c) I, II and IV only (d) II, III and IV only

[Ans. (b) I, III and IV only]

2. **Identify the correct statements from the below about "Actinomycetes".**

(I) Actinomycetes are also called 'Ray fungi'
(II) Produce an aerial mycelium.
(III) Their DNA contain high guanine and cytosine content.
(IV) It's also called as Actinobacteria

(a) I, II and III only (b) I, III and IV only
(c) II, III and IV only (d) I, II and IV only

[Ans. (b) I, III and IV only]

3. **Identify the correct statements from the following about "T_4 bacteriophage".**

(I) T_4 phage is rod shape.
(II) Consist of 2000 identical subunits.
(III) T_4 phage is tadpole shape.
(IV) Consists of head, collar, tail, base plates and fibers.

(a) II, III and IV only (b) I, II and III only
(c) I, III and IV only (d) I, II and IV only

[Ans. (a) II, III and IV]

4. **Identify the correct statements from the following about "Fungi".**

(I) The word "Fungus" is derived from Latin meaning "Mushroom".
(II) Study of fungi is called mycology.
(III) They exist in unicellular or multicellular forms.
(IV) Alexander Fleming is consider as founder of mycology.

(a) I, II and III only (b) II, III and IV only
(c) I, III and IV only (d) I, II and IV only

[Ans. (a) I, II and III only]

5. **Identify the correct statements from the below about "bacterial genome".**

(I) Nucleoid (II) Contains histone
(III) Linear
(IV) Absence of nuclear membrane

(a) I and IV only (b) I and II only
(c) III and IV only (d) All the above

[Ans. (a) I and IV only]

IV. Identify the wrong statements :

1. **Identify the wrong statement from the below.**

(a) The viruses possessing DNA are called Deoxy viruses.
(b) Majority of animal and bacterial viruses are DNA viruses.
(c) HIV possess DNA
(d) Cauliflower mosic virus possess DNA.

[Ans. (c) HIV possess DNA]

2. **Identify the wrong statement from the below about "*Frankia*".**

(a) *Frankia* is a symbiotic actinobacterium.
(b) It produces root nodules.
(c) It fixes nitrogen in leguminous plants.
(d) It produce multicellular sporangium.

[Ans. (c) It fixes nitrogen in leguminous plants]

3. **Identify the wrong statement from the below about 'Cyanobacteria'.**

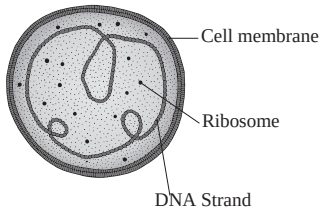
(a) Cyanobacteria are popularly called as "Blue green algae".
(b) Most of them are fresh water and few are marine.
(c) Cyanobacteria found in different habitats.
(d) Cyanobacteria decrease the level of free oxygen in atmosphere.

[Ans. (d) Cyanobacteria decrease the level of free oxygen in atmosphere]

4. **Identify the wrong statement from the below about 'Fungi'.**

(a) Fungi produce antibiotics like penicillin.
(b) Fungi cause food poisoning due to the production of toxins.
(c) Fungi do not cause diseases in Human Being.
(d) Fungi provide delicious and nutritious food called mushrooms. **[Ans. (c) Fungi do not cause diseases in Human Being]**

5. **Identify the wrong statement from the below about diagram "Mycoplasma".**



(a) Mycoplasma lack cell wall
(b) Mycoplasma appears like "Fried egg" in culture
(c) It cause disease in animals and plants
(d) Mycoplasma are very large organism

[Ans. (d) Mycoplasma are very large organism]

6. Identify the wrong statements from the below about diagram "Penicillin".

(a) Alexander Fleming discovered penicillin.
(b) Penicillin used in the world war II.
(c) In the form of yellow powder saved lives of soldier.
(d) E.J. Butler also involved in the discovery of penicillin. **[Ans. (d) E.J. Butler also involved in the discovery of penicillin]**

7. Identify the wrong statements from the below about "Importance of Mycorrhizae".

(a) Helps to derive nutrition.
(b) Does not improve the availability of minerals.
(c) Provides drought resistance to plants.
(d) Protects roots from the attack of plant pathogens.

[Ans. (b) Does not improve the availability of minerals]

V. Match the following :

1.

1.	C.G.Ehrenberg	(i)	Bacterial transformation
2.	Christian Gram	(ii)	Bacterium
3.	David H. Bergy	(iii)	Gram staining method
4.	Fredrick Griffith	(iv)	Bergey's manual

	1	2	3	4
(a)	ii	iii	iv	i
(b)	i	ii	iii	iv
(c)	ii	iv	i	iii
(d)	iii	i	ii	iv

[Ans. (a) 1 - ii, 2 - iii, 3 - iv, 4 - i]

2.

1.	Zygomycetes	(i)	Imperfect fungi
2.	Ascomycetes	(ii)	Club fungi
3.	Basidiomycetes	(iii)	Bread mold fungi
4.	Deuteromycetes	(iv)	Sac fungi

	1	2	3	4
(a)	iv	i	ii	iii
(b)	iii	iv	ii	i
(c)	i	ii	iii	iv
(d)	iii	ii	iv	i

[Ans. (b) 1 - iii, 2 - iv, 3 - ii, 4 - i]

3.

1.	Nutritious food	(i)	Yeast
2.	Single celled fungus	(ii)	Mush rooms
3.	Antibiotics	(iii)	Rennet
4.	Coagulation of milk	(iv)	Penicillin

	1	2	3	4
(a)	ii	i	iv	iii
(b)	i	ii	iii	iv
(c)	iv	iii	i	ii
(d)	iii	iv	i	ii

[Ans. (a) 1 - ii, 2 - i, 3 - iv, 4 - iii]

4.

1.	Sulphur Bacteria	(i)	Nitrosomonas
2.	Iron Bacteria	(ii)	Hydrogenomonas
3.	Hydrogen Bacteria	(iii)	Ferrobacillus ferrooxidans
4.	Nitrifying Bacteria	(iv)	Thiobacillus thiooxidans

	1	2	3	4
(a)	iv	iii	ii	i
(b)	i	ii	iii	iv
(c)	iv	i	ii	iii
(d)	iii	i	ii	iv

[Ans. (a) 1 - iv, 2 - iii, 3 - ii, 4 - i]

VI. Identify the correct assertion and reason:

1.
Assertion (A) : Major red tide incident in florida in the year 1982 killed hundreds and thousands of fishes.
Reason (R) : Red tide is caused by toxic Bloom of Dinoflagellates like *Gymnodinium breve and Gonyaulax tamarensis*.

(a) (A) is correct and (R) explains (A)
(b) (A) is correct, (R) is wrong
(c) Both (A) and (R) are wrong
(d) (A) is wrong (R) is correct

[Ans. (a) (A) is correct and (R) explains (A)]

2.
Assertion (A) : Prokaryote takes a joy ride on polar bear.
Reason (R) : Cynobacterium is a prokaryotic organism, grows on the fur of a polar bear.

(a) (A) is wrong and (R) is correct
(b) Both (A) and (R) are wrong
(c) (A) is correct and (R) explains (A)
(d) (A) is correct and (R) is wrong

[Ans. (c) (A) is correct and (R) explains (A)]

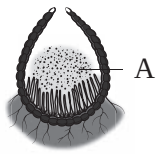
3. **Assertion (A) : The history of world war II recorded the use of penicillin.**
Reason (R) : Penicillin is an antibiotic, used in the form of yellow powder to save lives of soldiers.

(a) (A) is correct and (R) explains (A)
(b) (A) is wrong and (R) is correct
(c) Both (A) and (R) are wrong
(d) (A) is correct and (R) is wrong

[Ans. (a) (A) is correct and (R) explains (A)]

VIII. Identify the correct options for the parts of the diagram :

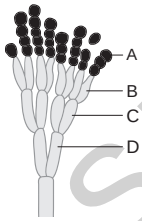
1. **Identify the parts marked as 'A' for the below diagram**



(a) Conidia (b) Pycniospore
(c) Seta (d) Conidiophore

[Ans. (b) Pycniospore]

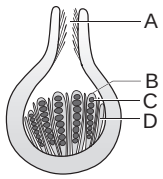
2. **Identify the parts marked as A, B, C and D for the below diagram "Conidia formation - Penicillium".**



	A	B	C	D
(a)	Sterigma	Metula	Ramus	Conidium
(b)	Conidium	Sterigma	Metula	Ramus
(c)	Ramus	Sterigma	Conidium	Metula
(d)	Conidium	Metula	Penicillin	Sterigma

[Ans. (b) A-Conidium, B-Sterigma C-Metula, D-Ramus]

3. **Identify the parts marked as A, B, C and D for the below diagram "V.S. of peritheium".**



	A	B	C	D
(a)	Ascus	Ascospore	paraphysis	Ostiole
(b)	Ascospore	Ascus	paraphysis	Ostiole
(c)	Ostiole	Ascus	Ascospore	paraphysis
(d)	Ostiole	Ascospore	Ascus	paraphysis

[Ans. (c) A-Ostiole, B-Ascus, C-Ascospore D-paraphysis]

VIII. Identify the correct pair from the below :

1. (a) Photoorgantrophs - *Rhodospirillum*
(b) Obligate aerobes - *Chlorobium*
(c) Anaerobes - *Chromatium*
(d) Photolithotrophs - *Campylobacter*

[Ans. (a) Photoorgantrophs - *Rhodospirillum*]

2. (a) P.A.Micheli - Copeland
(b) Asexual phase - Anamorph
(c) Actinomycetes - Fungi
(d) C.H. Blackley - Cell wall

[Ans. (b) Asexual phase - Anamorph]

IX. Identify the Incorrect pair from the below :

1. (a) *Lactobacillus lactis* - Curd
(b) *Salmonella typhi* - Typhoid
(c) Glycocaly X - Capsule
(d) Cell wall - lipoprotein

[Ans. (d) Cell wall - lipoprotein]

2. (a) Nucleoid - Genophore
(b) Micrococcus - Obigate aerobes
(c) Capnophilic Bacteria - O_2
(d) Green sulphur bacteria - Bacterioviridin

[Ans. (c) Capnophilic Bacteria - O_2]

X. Identify the Odd-man out from the below :

1. **Identify the odd-man out from the below.**

(a) Crustose (b) Foliose
(c) *Rhizopus* (d) Fructicose

[Ans. (c) *Rhizopus*]

Reason: *Rhizopus* is a type of fungi. Others are types of lichens.

2. Identify the odd-man out from the below.

(a) Athlete's foot (b) Anthracnose
(c) Aspergillosis (d) Candidiasis

[Ans. (b) Anthracnose]

Reason: Anthracnose is a fungal disease in plants. Others are fungal diseases in Humans.

Competitive Examination Questions

1. Which of the following are found in extreme saline conditions? (NEET-2017)

(a) Archaebacteria (b) Eubacteria
(c) Cyanobacteria (d) Mycobacteria

[Ans. (a) Archaebacteria]

2. Select the mismatch (NEET – 2017)

(a) *Frankia* *Alnus*
(b) *Rhodospirillum* *Mycorrhiza*
(c) *Anabaena* *Nitrogen fixer*
(d) *Rhizobium* *Alfalfa*

[Ans. (b) *Rhodospirillum - Mycorrhiza*]

3. 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 – 2017)

(a) *Bacillus* (b) *Pseudomonas*
(c) Mycoplasma (d) *Nostoc*

[Ans. (c) Mycoplasma]

4. Five Kingdom system of classification suggested by R.H. Whittaker is not based on (AIPMT – 2014)

(a) Presence or absence of a well defined nucleus
(b) Mode of reproduction
(c) Mode of nutrition
(d) Complexity of body organisation

[Ans. (a) Presence or absence of a well defined nucleus]

5. *Mycorrhizae* are the example of (NEET – 2017)

(a) Fungitasis (c) Amensalism
(b) Antibiosis (d) Mutualism

[Ans. (d) Mutualism]

6. Which of the following shows coiled RNA strand and capsomeres? (AIPMT – 2014)

(a) Polio virus (b) Tobacco mosaic virus
(c) Measles virus (d) Retrovirus

[Ans. (b) Tobacco mosaic virus]

7. Viroids differ from viruses in having : (NEET – 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

[Ans. (d) RNA molecules without protein coat]

8. Which of the following is correctly matched for the product produced by them? (NEET – 2017)

(a) *Acetobacter acetic* : Antibiotics
(b) *Methanobacterium* : Lactic acid
(c) *Penicillium notatum* : Acetic acid
(d) *Saccharomyces cerevisiae* : Ethanol

[Ans. (d) *Saccharomyces cerevisiae* : Ethanol]

9. Which of the following components provides sticky character to the bacterial cell? (NEET – 2017)

(a) Cell wall (b) Nuclear membrane
(c) Plasma membrane (d) Glycocalyx

[Ans. (d) Glycocalyx]

10. Which of the following statements is wrong for viroids? (NEET – 2016)

(a) They lack a protein coat
(b) They are smaller than viruses
(c) They causes infections
(d) Their RNA is a high molecular weight

[Ans. (d) Their RNA is a high molecular weight]

11. Which of the following would appear as the pioneer organisms on bare rocks? (NEET – 2016)

(a) Lichens (b) Liverworts
(c) Mosses (d) Green algae

[Ans. (a) Lichens]

12. One of the major components of cell wall of most fungi is (NEET – 2016)

(a) Chitin (b) Peptidoglycan
(c) Cellulose (d) Hemicellulose

[Ans. (a) Chitin]

13. Which one of the following statements is wrong? (NEET – 2016)

(a) Cyanobacteria are also called blue-green algae
(b) Golden algae are also called desmids
(c) Eubacteria are also called false bacteria
(d) Phycomycetes are also called algal fungi

[Ans. (c) Eubacteria are also called false bacteria]

14. Which part of the tobacco plant is infected by Meloidogyne incognita? **(NEET – 2016)**

(a) Flower (b) Leaf
(c) Stem (d) Root **[Ans. (d) Root]**

15. Chrysophytes, Euglenoids, Dinoflagellates and Slime moulds are included in the kingdom **(NEET – 2016)**

(a) Animalia (b) Monera
(c) Protista (d) Fungi
[Ans. (b) Monera]

16. The primitive prokaryotes responsible for the production of biogas from the dung of ruminant animals, include the **(NEET – 2016)**

(a) Halophiles (b) Thermoacidophiles
(c) Methanogens (d) Eubacteria
[Ans. (c) Methanogens]

Very Short Answers **2 MARKS**

1. Define growth.

Ans. Growth is an intrinsic property of all living organisms through which they can increase cells both in number and mass.

2. What is Homeostasis?

Ans. 1. Property of self-regulation and tendency to maintain a steady state within an external environment which is liable to change is called **Homeostasis**.
2. It is essential for the living organisms.

3. How was the word virus derived?

Ans. The word virus is derived from latin meaning 'Poison'.

4. Name the exceptions in viruses with regard to nucleic acid.

Ans. HIV is an animal virus which has RNA Cauliflower, Mosaic virus is a plant virus but has DNA.

5. What is a rophage?

Ans. In the lysogenic cycle of a phage, the integrated phage DNA is called prophage.

6. Name two viral diseases affecting Humans.

Ans. 1. AIDS.
2. Polio.

7. Mention any two features of bacteria.

Ans. 1. They are prokaryotes.
2. The genetic material is called nucleoid and lacks nuclear membrane.
3. They reproduce by fission.

8. What are capnophilic bacteria?

Ans. Bacteria which require CO_2 for their growth are called capnophilic bacteria . Eg: *Campylobacter.*

9. Categorise the following based on nutrition.

(a) *Chlorobium* (b) Iron bacteria

Ans. **(a)** *Chlorobium* - Photoautotrophic bacteria / Photolithotroph.
(b) Iron bacteria - Chemoautotrophic bacteria / Chemolithotroph.

10. What is retting of fibres?

Ans. The fibres from the fibre yielding plants are separated by action of the bacteria *Clostridium*. This is called **retting**.

11. What is the role of bacteria in production of Tea?

Ans. The special flavor and aroma of the tea are due to fermentation of Tea leaves by bacteria. Eg: *Bacillus megatherium*. This is called **curing of Tea** and **Tobacco**.

12. Name the bacteria which causes.

(a) Food Poisoning (b) Plague

Ans. **(a)** Food Poisoning - *Clostridium botulinum*
(b) Plague - *Yersinia Pestis*

13. What is the unique feature of cell membrane of Archaebacteria?

Ans. Presence of lipids like glycerol and isopropyl ethers in the cell membrane. Hence it shows resistance to cell wall antibiotics.

14. What is plectenchyma?

Ans. The mycelium is organised into loosely or compactly interwoven fungal tissues called plectenchyma.

15. What are holocarpic fungi?

Ans. 1. In holocarpic fungi, the entrire thallus is converted into a reproductive structure.
2. It is further divided into two types: prosenchyma and pseudoparenchyma.

16. What are coprophilic fungi?

Ans. Fungi growing on dung are called coprophilous fungi. Eg : *Pilobolus.*

17. Name the types of ascocarps.

Ans. Cleistothecium, Perithecium, Apothecium and Pseudothecium.

18. Why are club fungi so called?

Ans. 1. The basidium is club shaped with four basidiospores.
2. Thus this group of fungi (Basidiomycetes) is popularly called **club fungi**.

19. What is ergot?

Ans. 1. It's a fungal group refer to genus *Claciceps*.
2. It is a Alkaloid produced by *Claviceps purpurea* (fungus), called ergotamine. Its is used as vasoconstrictor.

20. What is the significance of yeast?

Ans. 1. Yeast is used for the fermentation of sugars to yield alcohol.
2. Bakeries use yeast for the production of bread, buns, rolls etc.

21. Why "Amanita verna" referred as "Toad stools"?

Ans. They are highly poisonous Fungi due to the production of Toxins. They are commonly referred as **"Toad stools"**.

22. Name some toxins produced by fungi.

Ans. Aflatoxin, Patulin, Ochratoxin A.

23. What is heterothallism?

Ans. In sexual reproduction of fungi, the two sexual hyphae are morphologically similar but dissimilar physiologically. This phenomenon is called **heterothallism**. Eg : ***Rhizopus.***

24. Bt crops - What are they?

Ans. Bt toxin found in *Bacillus thuringiensis* finds application in raising insect resistant crops. They are called as **Bt crops**.

25. Name a biodegradable plastic.

Ans. PHB (Poly-β hydroxyl butyrate) is a microbial plastic synthesize by *Ralstonia*. It is biodegradable plastic.

26. Name the causal agent of Duodenal ulcer.

Ans. *Helicobacter pylori.*

27. Name a microbe used in PCR technology.

Ans. *Thermus aquaticus* is a thermophilic gram negative bacteria which produces Taq Polymerase a key enzyme for Polymerase Chain Reaction (PCR).

28. Cyanobacteria helped in raising level of free oxygen in Atmosphere. Do you agree?

Ans. 1. Yes. The stramolite deposits are formed when colonies of cyanobacteria bind with calcium carbonate. (2.7 billion years old).
2. Their abundance in fossil records proves that they have helped to raise level of free oxygen in the atmosphere.

29. Name the organism from which Red sea got its name.

Ans. *Trichodesmium erythraeum* a cyanobacterium which imparts red colour to the water.

30. What is the significance of phytophthora infestans?

Ans. 1. It is a fungus which causes late blight of potato and affected the potato crop in Ireland.
2. It caused a million deaths forcing people to migrate, since potato is the staple food in Ireland.

31. What does SARS stand for?

Ans. SARS - Severe Acute Respiratory Syndrome.

32. List out the property of living things.

Ans. Movement, Nutrition, Respiration and Excretion are considered as the property of living things.

33. Define metabolism. Mention its types.

Ans. 1. The sum total of all the chemical reactions taking place in a cell of a living organism is called metabolism.
2. **Types of metabolism:**
(i) Anabolism, **(ii)** Catabolism

34. What is the name of DNA virus and RNA virus?

Ans. 1. The Name of DNA Virus - **'Deoxyviruses'.**
2. The Name of RNA Virus - **'Riboviruses'.**

35. What does cyanophages mean? Who reported it?

Ans. 1. Viruses infecting blue green algae are called **Cyanophages.**
2. Reported - **Safferman** and **Morris** in the year 1963.

36. What does Mycophages mean?

Ans. 1. The viruses attacking fungi are called **Mycoviruses** or **Mycophages.**
2. Mycophages were first reported by Hollings in 1962.

37. Name some viral diseases seen in Animals.

Ans. 1. Cattle - Foot and mouth disease
2. Dog - Rabies
3. Horse - Encephalomyelitis

38. What is the name of small circular RNAs which are similar to viroids?

Ans. Virousoid are the small circular RNAs which are similar to viroids but they are always linked with larger molecules of the viral RNA. Discovered by J.W. Randles and Co-workers in 1981.

39. Mention the function of glycocalyx.

Ans. It is a thick, gelatinous layer bound tightly to the cell wall of bacteria. It protects the cell from dessiccation and antibodies.

40. Define transformation.

Ans. The phenomenon of changing the character of a strain by transferring the DNA of another strain into the former is called **transformation.** It is one of the method of sexual reproduction in bacteria.

41. Mention any two human diseases caused by Bacteria.

Ans.

No.	Disease	Bacteria
1.	Cholera	*Vibrio Cholerae*
2.	Leprosy	*Mycobacterium leprae*
3.	Tuberculosis	*Mycobacterium tuberculosis*
4.	Pneumonia	*Diplococcus pneumoniae*

42. Differentiate plant growth from animal growth.

Ans.

No.	Plant growth	Animal growth
1.	Growth is indefinite.	Growth is definite.
2.	It occurs throughout life	It occurs for some period.

43. How do Viroids differ from Viruses?

Ans.

No.	Viroid	Viruses
1.	Circular molecule of ssRNA.	Nucleic acid - RNA or DNA.
2.	Without a capsid.	Covered by capsid.
3.	RNA has low molecular weight.	RNA or DNA may be single or double stranded.

44. Distinguish between Photolithotrophs and Photoorganotrophs.

Ans.

Photolithotrophs	Photoorganotrophs
In photolithotrophs, the hydrogen donor is an organic acid or alcohol.	In Photoorganotrophs, the hydrogen donor is an inorganic substance. E.g: *Chlorobium*, *Rhodospirillum*

45. What are polysomes?

Ans. Ribosomes held together, by mRNA form polysomes or polyribosomes and are the sites of protein synthesis in a cell.

46. Explain generalised transduction.

Ans. The ability of a bacteriophage to carry genetic material of any region of bacterial DNA is called **generalised transduction**.

47. Explain specialized transduction or restricted transduction.

Ans. The ability of the bacteriophage to carry only a specific region of the bacterial DNA is called **specialized** or **restricted transduction**.

48. What are Hormogones?

Ans. A portion of filament of blue green algae that becomes detatched and reproduces by cell division. Eg : ***Nostoc.***

49. Why do we call Actinomycetes as 'Ray fungi'?

Ans. Actinomycetes are also called 'Ray Fungi' due to their mycelia like growth. Eg: *Streptomyces.*

50. What do you understand from the term 'Teleomorph'?

Ans. Sexual phase in the reproduction of fungi is called **Teleomorph**.

51. Blue green algae can also be called as myxophyceae. How?

Ans.
1. The presence of mucilage around the thallus is characteristic feature of cyanobacteria group.
2. Therefore, this group is also called myxophyceae.

52. Mention the kingdoms included in Whittaker's classification.

Ans. The Kingdoms include Monera, Protista, Fungi, Plantae and Animalia.

53. Growth of living thing is an intrinsic property- Justify.

Ans.
1. Living cells grow by the addition of new protoplasm within the cells.
2. Therefore, growth in living thing is intrinsic.

54. Define Anabolism.

Ans. The process of building up or synthesis of complex substances from simpler ones. Eg: Photosynthesis.

55. Define Catabolism.

Ans. The process of breakdown of complex substances into simpler substances.
Eg: Respiration, Releasing waste outside.

56. What are the twin characteristics of growth?

Ans. Increase in mass and increase in number of individuals are the twin characteristics of growth.

57. Write the name of any two organisms that show fragmentation.

Ans.
1. Filamentous algae.
2. Protonema of mosses.

58. Define Fungi.

Ans.
1. Fungi are ubiquitous, eukaryotic, achlorophyllous heterotrophic organisms.
2. They exist in unicellular or multicellular forms.

59. Define mycology. Who is the founder of mycology?

Ans. Study of fungi is called **mycology**. P.A. Micheli is considered as the founder of mycology.

60. Write the features of living things.

Ans.
1. Growth and metabolism.
2. Reproduction.
3. Ability to sense stimuli (Consciousness)
4. Ability to self-replicate and self - organise.

61. Explain the statement of non-living things also grow.

Ans.
1. Non-living things like mountains, boulders, sand dunes also grow by accumulating the material on their external surface.
2. But, this growth is considered as external growth in comparison to the growth of living things which is internal.

62. What is reproduction?

Ans. The production of new individuals or offsprings which can be accomplished by sexual or asexual reproduction.

63. What are the advantages of consciousness in living organism?

Ans.
1. Consciousness enables an organism to respond to various external factors.
2. It is the ability of living organisms to respond to various physical, chemical and biological stimuli from their surroundings.

64. List out the external factors / stimuli influencing plants.

Ans. Light, Water, Temperature, Pollutants, these are the external factors of stimuli.

65. What does bacteriophage means?

Ans. Bacteriophages are viruses which attack and destroy bacteria.

66. What is the need for classification?

Ans. **Need for classification:**
1. To relate things based on common characteristic features.
2. To define organisms based on the salient features.
3. Helps in knowing the relationship amongst different groups of organisms.

67. Define Genophore.

Ans.
1. The bacterial chromosome is a single circular DNA molecule, tightly coiled and is not enclosed in a membrane as in Eukaryotes.
2. This genetic material is called **nucleoid** or **genophore**.

68. What are Endospores?

Ans. During unfavourable condition bacteria produce thick walled resting spores called **endospores**. Eg: ***Clostridium tetani* produces endospores.**

69. How are fungi classified at present?

Ans. Fungi are classified into three divisions namely Gymnomycota, Mastigomycota and Amastigomycota.

70. What is Pruteen?

Ans.
1. "Pruteen" is a single cell protein.
2. Derived from ***Methylophilus*** and ***Methylotropus.***

71. Name some important antibiotics produced by Actinomycetes.

Ans. Streptomycin, Chloramphenicol, and Tetracycline.

72. Why are lichens called as dual organisms?

Ans. Lichens are dual organisms because they contain fungus or mycobiont and an algae or phycobiont.

73. What is hyphae?

Ans. The fungal body is an assemblage of long extremely fine, almost transparent threads called **hyphae**.

74. What is mycelium?

Ans. Numerous hyphae are twined around one another to form **mycellium** - vegetative body of a fungus.

75. What are lichens?

Ans.
1. They are symbiotic associations formed between algae and fungi.
2. The algal component (autotrophic) is called **phycobiont** and fungal component (heterotrophic) is **mycobiont.**

76. Define the role of algal partner or phycobiont in a lichen.

Ans.
1. Nitrogen fixation (if cyanobacterial type)
2. Photosynthesis
3. Provides vitamins and other growth substances.

77. Distinguish between anamorph and telomorph.

Ans.
1. The asexual phase of fungi is called **anamorph**.
2. The sexual phase of fungi is called **telomorph**.

78. What is holomorph?

Ans. Fungi showing both sexual and asexual phases are called **holomorph**.

79. Define the role of fungal partner or mycobiont in a lichen.

Ans.
1. Outer covering for protection.
2. Attachment to substratum.
3. Protection against harmful radiations.

80. Mention the types of asexual reproduction in lichens.

Ans. Fragmentation, Soredia and Isidia.

81. What is ghost?

Ans. 1. During virulent cycle of a phage in the 'penetration'stage, the DNA of phage is injected into the bacterial cell.
2. The empty protein coat of phage left outside the cell is called **ghost**.

82. What is a lysogenic phage?

Ans. 1. In the lysogenic cycle of phage, the phage DNA gets integrated into the DNA of the host cell and gets multiplied along with nucleic acid of the host.
2. No independent viral particle is formed.

83. Why are viruses considered to be a biologist's puzzle?

Ans. 1. They exhibit both living and non living characteristics. Hence they are considered to be a biologists puzzle.
2. They multiply within a living host and act as non living particles outside host cell.

84. What is red tide ?

Ans. 1. Red tide is caused by toxic bloom of Dinoflagellates like *Gymnodinium* species.
2. A major red tide incident in west coast of Florida in the year (1982) killed thousands of fishes.

85. Why is Robert koch considered to be the founder of modern bacteriology?

Ans. 1. He identified the causal organism for Anthrax, Cholera and Tuberculosis.
2. He experimentally proved the concept of infection.
3. He received a Nobel prize in Medicine (1905).

86. Does Yoghurt a good source of probiotics?

Ans. Yes.
1. Probiotics are live microorganisms that when administered in adequate amounts confer health benefit on the host. Eg: **Yoghurt** is a probiotic food. It contains ***Lactobacillus*** species.
2. It maintains gut flora in humans and maintains good health.

87. Which bacteria is called a super bug?

Ans. A bacterium named *Pseudomonas putida* is a superbug genetically engineered which breakdown hydrocarbons.

88. How does *Agrobacterium* help in Genetic engineering?

Ans. *Agrobacterium tumefaciens* causes crown gall disease in plants but its inherent tumour inducing principle helps to carry the desired gene into the plant through Genetic engineering.

89. Define reproduction and mention its types.

Ans. 1. Reproduction is the tendency of a living organism to replicate its own species.
2. There are two types of reproduction namely asexual and sexual.

90. Name some toxins produced by Fungus.

Ans. Alfatoxin, Patulin and Ochratoxin-A.

91. List out the antibiotics produced by fungi.

Ans. Penicillin, cephalosporins and griseofulvin.

92. Name the hydrogen donor of green sulphur bacteria and purple sulphur bacteria.

Ans. 1. Hydrogen donor of green sulphur bacteria is H_2S.
2. Hydrogen donor of purple sulphur bacteria is thiosulphate.

93. Deuteromycetes are imperfect fungi - Justify.

Ans. The fungi belonging to deuteromycetes lack sexual reproduction and are called imperfect fungi.

Short Answers — 3 MARKS

1. Mention the potential applications of fungi in agriculture.

Ans. 1. Mycorrhiza forming fungi like *Rhizoctonia* helps in absorption of water and minerals.
2. Fungi like *Beauveria bassiana* are used as biopesticides to eradicate crop pests.
3. Gibberellin is a plant growth promoter produced by a fungus *Gibberella fujikuroi*.

2. What is transduction? Mention the types.

Ans. Phage mediated DNA transfer is called transduction. Two types.

1. **Generalised transduction:**
The ability of a bacteriophage to carry genetic material of any region of bacterial DNA is called generalised transduction.
2. **Specialized or Restricted transduction:**
The ability of the bacteriophage to carry only a specific region of the bacterial DNA is called specialized or restricted transduction.

3. Distinguish Prokaryotic and Eukaryotic organisms.

Ans.

No.	Prokaryotic	Eukaryotic
1.	Unicellular organisms.	Unicellular or multicellular organisms.
2.	Lack membrane bound nucleus.	Definite nucleus is present bound by nuclear membrane.
3.	Organelles like mitochondria, endoplasmic reticulum are absent.	Organelles like mitochondria, endoplasmic reticulum are present.
4.	Eg : ***Amoeba.***	Eg : ***Oedogonium.***

4. What are the three main symmetry of viruses?

Ans. Generally viruses are of three types based on shape and symmetry.

1. Cuboid symmetry-Eg: Adenovirus, Herpes virus.
2. Helical symmetry - Eg : Influenza virus, TMV.
3. Complex or Atypical symmetry - Eg : Bacteriophage, Vaccinia virus.

5. Write down the living characteristic features of virus.

Ans.

1. Presence of nucleic acid and protein.
2. Capable of mutation.
3. Ability to multiply within living cells.
4. Ability to infect and cause diseases in living beings.
5. Show irritability.
6. Host –specific.

6. Write down the non- living characteristic features of virus.

Ans.

1. Can be crystallized.
2. Absence of metabolism.
3. Inactive outside the host.
4. Do not show functional autonomy.
5. Energy producing enzyme system absent.

7. Explain the circular molecule of ssRNA without a capsid?

Ans.

1. Viroid is a circular molecule of ssRNA without a capsid and was discovered by **T.O. Diener** in the year **1971.**
2. The RNA of viroid has low molecular weight. Viroids cause citrus exocortis and potato spindle tuber disease in plants.

8. What are Prions? Who discovered it?

Ans.

1. Prions are the causative agents for about a dozen fatal degenerative disorders of the central nervous system of humans and other animals.
2. For Eg : **Creutzfeldt – Jacob Disease (CJD), Bovine Spongiform Encephalopathy (BSE)** – commonly known as **mad cow disease.**
3. Discovered by **Stanley B. Prusiner** in the year **1982**.

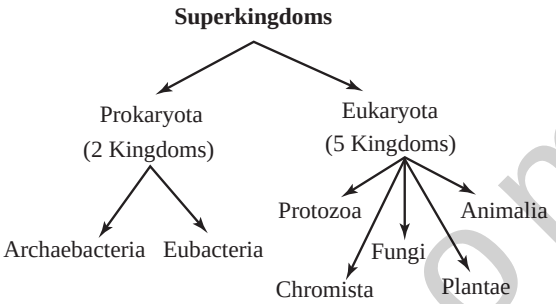
9. What are the symptoms of Tobacco Mosaic Disease?

Ans.

1. Discoloration of leaf colour along the veins.
2. Typical yellow and green mottling which is the mosaic symptom.
3. Downward curling of young apical leaves.
4. Stunted growth.

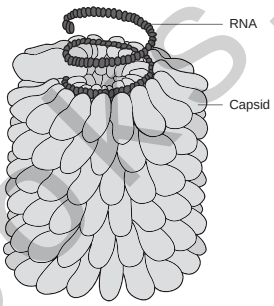
10. Name the divisions of seven kingdom classification?

Ans.



11. Draw the structure of TMV and label the parts.

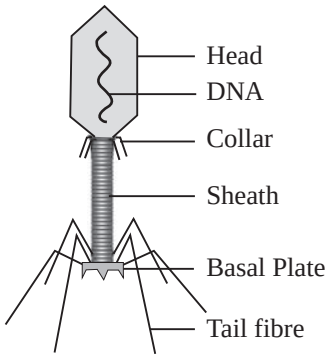
Ans.



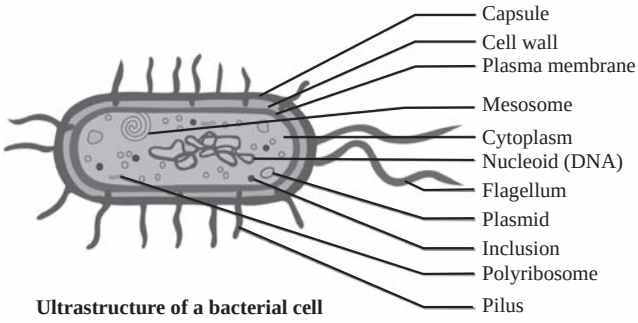
TMV (Tobacco Mosaic Virus)

12. Draw a T_4 bacteriophage and label the parts.

Ans.



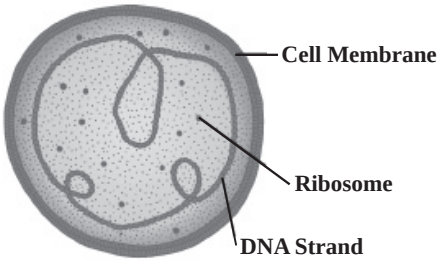
13. Draw a neat diagram of ultra structure of a bacterial cell.



Ultra structure of bacterial cel

14. Draw a labelled diagram of *Mycoplasma*.

Ans.



15. List out the bacteria used in dairy industry.

Ans.

No.	Bacteria	Role
1.	*Streptococcus lactis* and *Lactobacillus bulgaricus.*	Making curd (Convert milk sugar lactose into lactic acid).
2.	*Lactobacillus lactis.*	Used in making cheese.
3.	*Streptococcus lactis.*	Used in curd and making butter.

16. List out the Animal diseases caused by Bacteria.

Ans.

Animal diseases			
No	**Name of the Animal**	**Name of the diseases**	**Name of the pathogen**
1.	Sheep	Anthrax	*Bacillus anthracis*
2.	Cattle	Brucellosis	*Brucella abortus*
3.	Cattle	Bovine tuberculosis	*Mycobacterium bovis*
4.	Cattle	Black leg	*Clostridium chanvei*

17. What are Actinomycetes ? Give example.

Ans.

1. Actinomycetes or 'Ray fungi' are anaerobic or facultative anaerobic microorganisms.
2. They show mycelia like growth.
3. Eg : **Streptomyces.**

18. What is Mycorrhiza? Mention the types.

Ans. The Symbiotic association between fungal mycelium and roots of plants is called as **Mycorrhizae**.

Types:

1. Ectomycorrhizae
2. Endomycorrhizae
3. Ectendomycorrhizae

19. Mention the economic importance of lichens.

Ans.

1. Lichens secrete organic acids like Oxalic acids which corrodes the rock surface and helps in weathering of rocks, acting as pioneers in xerosere.
2. Lichens are sensitive to air pollutants and are considered as pollution indicators.
3. ***Cladonia rangiferina*** (Reindeer moss) is used as food for animals living in Tundra regions.
4. Usnic acid produced from lichens show antibiotic properties. (Note: (Any three points).

20. Cyanobacteria plays a major role in our ecology. Discuss.

Ans.

1. Cyanobacteria, also known as **'Blue green algae'** help in carbon fixation in a major way on the ocean surface.
2. They are helpful in nitrogen fixation in paddy fields leading to a better harvest.
3. About 80% of photosynthesis on ocean surface is done by cyanobacteria. So, it can be said that they play a major role in our ecology.

21. Write down the characteristics features of Archaebacteria.

Ans.

1. They are most primitive prokaryotes.
2. They are found in extreme environmental conditions. Eg: Hot springs.
3. Unique feature is presence of lipids like glycerol and isopropyl ethers in their cell membrane. Hence the membrane shows resistance against cell wall antibiotics. Eg: Methanobacterium.

22. What are Gram-Positive bacteria?

Ans.

1. The bacteria which retain the violet colour in Gram's staining procedure are called as Gram Positive bacteria.
2. Eg: *Pneumococcus, Streptococcus.*

23. What are Gram-Negative bacteria?

Ans.

1. The bacteria which become decolourised and appear in red colour in Gram's staining procedure are called as gram negative bacteria.
2. Eg: *E.coli, Salmonella.*

24. What is the importance of Mycorrhizae?

Ans. **Importance of Mycorrhizae :**

1. Mycorrhizae helps to derive nutrition in Monotropa, a saprophytic angiosperm.
2. Improves the availability of minerals and water to the plants.
3. Provides drought resistance to the plants.
4. Protects roots of higher plants from the attack of plant pathogens.

25. Lichens are the pioneer organisms. Justify.

Ans.

1. Lichens are the pioneer organisms in the new terrains which colonise bare rocks, mountains and cliffs.
2. They corrode the rocks and accumulate a certain amount of minerals and organic matter.
3. The plants like mosses and grasses appear later in succession, utilizing the first soil formed by lichens.
4. Lichens thus, can convert a barren area into one that can support vegetation.

26. Discuss in detail about the Bacterial Chromosome.

Ans.

1. The Bacterial Chromosome is a single circular DNA molecule, tightly coiled and is not enclosed in a membrane as in Eukaryotes.
2. This genetic material is called **Nucleoid** or **Genophore.**
3. The DNA is not bound to histone proteins.

27. Name some plant diseases caused by Fungi.

Ans. **Plant diseases caused by Fungi:**

No.	Name of the disease	Causal organism
1.	Red rot of sugarcane	*Colletotrichum falcatum*
2.	Anthracnose of Beans	*Colletotrichum lindemuthianum*
3.	White rust of crucifers	*Albugo candida*

28. List out some Human diseases caused by Fungi.

Ans. **Human diseases caused by fungi:**

No.	Human diseases	Causal organisam
1.	Athlete's foot	*Epidermophyton floccosum*
2.	Candidiasis	*Candida albicans*
3.	Coccidioidomy-cosis	*Coccidioides immitis*
4.	Aspergillosis	*Aspergillus fumigatus*

29. Tabulate the difference between anabolism and catabolism.

Ans. Metabolism includes Anabolism and Catabolism.

No.	Anabolism	Catabolism
1.	Building up process.	Breaking down process.
2.	Smaller molecules combine together to form larger molecule.	Larger molecule break into smaller units.
3.	Energy is consumed.	Energy is released.
4.	Chemical energy is formed and stored.	The stored chemical energy is released and used.
5.	Eg: Synthesis of proteins from amino acids.	Eg :Breaking down of glucose to CO_2 and water

30. List some viral diseases which occur in plants.

Ans. **Plant diseases :**

1. Tobacco Mosaic Disease.
2. Cauliflower Mosaic Disease.
3. Sugarcane Mosaic Disease.
4. Potato leaf roll.
5. Bunchy top of banana.
6. Leaf curl of papaya.
7. Vein clearing of Lady's finger.
8. Rice tungro Disease.
9. Cucumber Mosaic Disease.
10. Tomato spotted wilt Disease.

Note: 6 diseases may be listed for **3 Marks** question.

Long Answers — 5 MARKS

1. List some viral diseases which occur in Humans.

Ans. **Human Diseases :**

1. Common cold.
2. Hepatitis B.
3. Cancer.
4. SARS (Severe Acute Respiratory Syndrome).
5. AIDS (Acquied Immuno Deficiency Syndrome).
6. Rabies.
7. Mumps.
8. Polio.
9. Chikungunya.
10. Small Pox.
11. Chicken pox.
12. Measles.

Note: 6 diseases may be listed for **3 Marks** question.