

**2021**

***Time - 3 hours***

***Full Marks - 60***

*Answer **all groups** as per instructions.  
Figures in the right hand margin indicate marks.  
Candidates are required to answer  
in their own words as far as practicable.  
Draw labelled diagrams wherever necessary.*

**GROUP – A**

1. Answer all questions in one or two words each . [1 × 8
- (a) Who first isolated and crystallized TMV ?
  - (b) Viruses which kill bacteria are called what ?
  - (c) Who discovered bacteria ?
  - (d) Name the cell wall material of cyanobacteria.
  - (e) F.E. Fritsch divided algae into how many classes ?
  - (f) Coleochaete shows which type of life cycle pattern ?
  - (g) Name the male reproductive structure of Chara.
  - (h) Name the reserve food found in red algae.



[ 2 ]

**GROUP – B**

2. Write notes on any eight of the following within two to three sentences each. [1½ × 8

- (a) Viroids
- (b) Prions
- (c) Structure of TMV
- (d) Mycoplasma
- (e) Significance of heterocyst
- (f) Types of flagella in algae
- (g) Agar-agar
- (h) Coenobium
- (i) Nucule of Chara
- (j) Conceptacles of Fucus

**GROUP – C**

3. Explain any eight of the following within 75 words each. [2 × 8

- (a) Biological characteristics of viruses
- (b) Role of viruses in vaccine production
- (c) Role of viruses in diagnostics
- (d) Archaeobacteria



- (e) Evolutionary significance of prochloron
- (f) Pigments found in algae
- (g) Nanandrium
- (h) Morphology of Chara
- (i) Unilocular sporangia
- (j) Thallus structure of Fucus

**GROUP – D**

*Answer **any four** questions within 500 words each.*

- 4. Explain the process of replication in DNA viruses. [6]
- 5. Give an account of economic importance of bacteria with reference to their role in industry. [6]
- 6. Explain the life cycle of Nostoc. [6]
- 7. Give an account of range of thallus organization in algae. [6]
- 8. Explain the life cycle of Chlamydomonas. [6]
- 9. Describe the process of sexual reproduction in Vaucheria. [6]
- 10. Explain sexual reproduction in Polysiphonia. [6]



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**GROUP – A**

1. Answer all questions in one or two words each . [1 × 8]
- (a) Sugar formed by linkage of one unit of glucose and one unit of fructose is called –
  - (b) Chemical bonds formed when electrons are shared are called–
  - (c) The organic compounds which serve as cofactors are called–
  - (d) The most abundant RNA in the cell is –
  - (e) Protoplasmic connection between two plant cells is called–
  - (f) A multinucleate plant cell is called–
  - (g) Lysosome was discovered by–
  - (h) Who first studied mitotic cell division in plant cell ?



[ 2 ]

**GROUP – B**

2. Write notes on any eight of the following within two to three sentences each. [1½ × 8

- (a) Buffers
- (b) Exergonic reactions
- (c) Prosthetic group
- (d) Essential fatty acids
- (e) Protein denaturation
- (f) t-RNA [Transfer RNA]
- (g) Characteristics of prokaryotic cell
- (h) Chemical composition of plasma membrane
- (i) Microtubules
- (j) Synapsis

**GROUP – C**

3. Explain any eight of the following within 75 words each.

[2 × 8

- (a) Ionic bond
- (b) Structure of maltose
- (c) Structure and functions of cellulose



- (d) Classification of amino acids
- (e) Secondary structure of proteins
- (f) Endosymbiotic theory
- (g) Cell wall
- (h) Nucleolus
- (i) Peroxisomes
- (j) Types of lysosomes

**GROUP – D**

*Answer any four questions within 500 words each.*

- 4. Briefly explain the mechanism of enzyme action. [6]
- 5. Describe the structure and functions of monosaccharides. [6]
- 6. Describe different types of DNA. Illustrate the structure of B-types of DNA. [6]
- 7. Describe various types of membrane transport. [6]
- 8. Discuss molecular organisation of chromatin. [6]
- 9. Describe the structure and functions of chloroplast. [6]
- 10. Describe different stages of meiosis with particular emphasis on Prophase-I. [6]



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**GROUP – A**

1. Fill in the blanks by choosing correct answer given in the brackets. (all) [1 × 8]

- (a) Agar agar is obtained from \_\_\_\_\_.  
(green algae, red algae, brown algae, blue green algae)
- (b) \_\_\_\_\_ bacteria is found in nodules of family Leguminosae.  
(Rhizobium, Azotobactor, Nitrobactor, None of these)
- (c) The cell wall of fungi is made up of \_\_\_\_\_.  
(chitin, cellulose, pectin, suberin)
- (d) Venter is the part of \_\_\_\_\_.  
(sporogonium, sporangium, antheridium, archegonium)



[ 2 ]

Express in one word.

- (e) Hollow spherical colony in volvox –
- (f) A parasite which can live as a saprophyte –
- (g) A diploid tissue responsible for the formation of sporogenous tissue –
- (h) A stele without a central pith –

**GROUP – B**

2. Answer any eight of the following questions within two to three sentences each. [1½ × 8

- (a) What is DNA virus ?
- (b) What is TMV ?
- (c) What is Heterocyst ?
- (d) What is eye spot ?
- (e) What is nannandrium in *Oedogonium* ?
- (f) What is needle in *Pinus* ?
- (g) What is strobilus ?
- (h) What is prothallus ?
- (i) What is siphonostele ?
- (j) What is conidium ?



GROUP – C

3. Answer any eight of the following questions within 75 words each.

[2 × 8

- (a) What is lytic life-cycle of virus ?
- (b) What is conjugation in bacteria ?
- (c) What is tetra sporophyte ?
- (d) What is heterospory ?
- (e) Why the life-cycle of Puccinia is called as macrocyclic ?
- (f) What is Gemma cup ?
- (g) What is meristele ?
- (h) Why Cycas is called as a living fossil ?
- (i) What is sporogonium ?
- (j) What is bacterial transformation ?

GROUP – D

Answer **any four** questions within 500 words each.

- 4. Explain about bacterial conjugation. [6
- 5. Write about the life-cycle of *Nostoc* with suitable diagrams. [6
- 6. Explain briefly about the economic importance of algae. [6



7. With suitable diagram, write about the sexual reproduction in *Oedogonium*. [6]
8. Explain briefly the sexual reproduction in *Marchantia*. [6]
9. Briefly discuss about the stellar evolution in Pteridophytes. [6]
10. Giving the systematic position of *Pinus*, state its occurrence and salient features of morphology and anatomy. [6]