

2018

Full Marks - 60

Time - 3 hours

The questions are of equal value

Answer *all* questions

Give diagrams wherever necessary

1. a) Define genetic material and briefly describe its properties. Describe the experiment of Griffith which shows DNA as genetic material.
- b) Write notes on the following :
 - i) Genetic Material in TMV
 - ii) Findings of Avery, McLeod and McCarty.

OR

- c) Give an account of historical perspective describing DNA as carrier of genetic information. Describe experiment of Hershey and Chase supporting the view.
- d) Write notes on the following :
 - i) Transformation
 - ii) RNA as genetic material.

[2]

2. a) Describe double helix model of DNA with suitable diagram. Briefly describe different forms of DNA double helices.
- b) Write notes on the following :
- i) tRNA
 - ii) Q mode of replication.

OR

- c) Discuss DNA replication as semi-conservative one.
- d) Write notes on the following :
- i) Nucleosome
 - ii) Nucleotide.
3. a) What is genetic code ? Explain its essential features.
- b) Write notes on the following :
- i) Spliceosome
 - ii) RNA editing.

OR

- c) Describe the mechanism of transcription in prokaryotes.
- d) Write notes on the following :
- i) Central dogma
 - ii) Group I and Group II intron splicing.
4. a) Describe the various steps of Protein Synthesis.
- b) Write notes on the following :
- i) Ribosome Structure
 - ii) Inhibitors of Protein Synthesis.

OR

- c) Describe Ribosome structure and assembly of mRNA and t-RNA.
- d) Write notes on the following :
- i) Post-translational modification of proteins
 - ii) Inhibitors of Protein Synthesis.
5. a) What is Operon ? Explain the operon model of gene regulation using lac-operon of E.coli.

- b) Write notes on the following :
- i) Steroid hormone
 - ii) Heat-shock proteins.

OR

- c) What is repressible operon ? Describe the regulation of repressible tryptophan operon.
- d) Write notes on the following :
- i) Gene silencing
 - ii) Eukaryotic transcription.

2018

Full Marks - 40

Time - 2 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Give an account of food values and medicinal values of Mushrooms. 4
- b) Write notes on the following : 2 × 2
- i) Poisonous Mushrooms
- ii) Culture of *Agaricus bisporous*.

OR

- c) Describe about atleast two edible Mushrooms found in India. 4
- d) Write notes on the following : 2 × 2
- i) Medicinal value of *Pleurotus citronopileatus*
- ii) Mushroom in food industry.

[Turn Over

[2]

2. a) Describe the preparation of various compost material locally available for Mushroom Cultivation. 4

b) Write notes on the following : 2 × 2

i) Casing

ii) Indoor Cultivation.

OR

c) Describe the infrastructure for cultivation of Mushroom. 4

d) Write notes on the following : 2 × 2

i) Mushroom unit

ii) Spawning the compost.

3. a) How Mushroom beds are prepared by low-cost technology ? 4

b) Write notes on the following : 2 × 2

i) Preparation of Spawn

ii) Maize-straw bed.

OR

[3]

- c) How mushroom spawns are prepared by pure culture method ? Explain. 4
- d) Write notes on the following : 2 × 2
- i) Multiplication of mushroom
 - ii) Factor affecting bed preparation.
4. a) Describe the different process of storage of mushroom. 4
- b) Write notes on the following : 2 × 2
- i) Aminoacid and mineral content in Mushroom
 - ii) Vitamins in Mushroom.

OR

- c) What are the different nutrients present in Mushroom ? Give a brief account of it. 4
- d) Write notes on the following : 2 × 2
- i) Canning
 - ii) Crude fibre content Vitamins.
5. a) Name two research centres each in National and Regional level with its role in research. 4

L-389-9



2018

Full Marks - 60

Time - 3 hours

The questions are of equal value

Answer *all* questions

Give diagrams wherever necessary

1. a) Describe the three parts comprising the physical constituent of environment.
- b) Write notes on the following :
 - i) Autoecology
 - ii) Homeostasis.

OR

- c) What are the different approaches in Ecology based on the level of organization.
- d) Write notes on the following :
 - i) Biosphere
 - ii) Lithosphere.

2. a) What is Soil Profile ? Describe the factors that affect soil formation.
- b) Write notes on the following :
- i) Precipitation
 - ii) Effect of five and adaptation by plants.

OR

- c) Light is an ecological factor, explain.
- d) Write notes on the following :
- i) Hydrological cycle
 - ii) Effect of temperature on plants.
3. a) With suitable example discuss the different forms of seral community in water.
- b) Write notes on the following :
- i) Commensalism
 - ii) Ecotone.

OR

- c) Give a broad outline of various types of positive interaction among organism.
 - d) Write notes on the following :
 - i) Xerosere
 - ii) Characters of Plant Community.
4. a) Give an account of the structure and function of an ecosystem.
- b) Write notes on the following :
 - i) Cycling of Nitrogen
 - ii) Ecological Pyramids.

OR

- c) Describe the energy flow in a typical ecosystem.
 - d) Write notes on the following :
 - i) Productivity
 - ii) Food chain.
5. a) Describe in brief the different phytogeographical regions of India.

b) Write notes on the following :

i) Local Vegetation

ii) Endemism.

OR

c) What is biome ? Describe the characters of a tropical biome.

d) Write notes on the following :

i) Continental drift

ii) Tundra biome.

2018

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Describe important Herbaria of India and World, and functions of Herbarium. 6
- b) Write notes on the following : 3 × 2
- i) E flora
- ii) Monograph.

OR

- c) What is botanical garden ? Give a brief note on the botanical garden of Sibpur, Howrah. 6
- d) Write notes on the following : 3 × 2
- i) Documentation
- ii) Single access and multiaccess.

[2]

2. a) Write an essay on Taxonomic hierarchy. 6
- b) Write notes on the following : 3 × 2
- i) Principle of Priority
 - ii) Typification.

OR

- c) Describe the principle and rules of ICBN. 6
- d) Write notes on the following : 3 × 2
- i) Biological and evolutionary species concept
 - ii) Rejection of Names.
3. a) Discuss Hutchinson system of classification with merits and demerits. 6
- b) Write notes on the following : 3 × 2
- i) Outline of APG system
 - ii) Cytology in relation to taxonomy.

OR

- c) Give an account of classification given by Betham and Hooker. Explain why it is natural ? 6

[3]

d) Write notes on the following : 3×2

i) Palynology

ii) Merits and demerits of Takhtajan system of classification.

4. a) What is numerical taxonomy ? Describe its role and significance in taxonomy. 6

b) Write notes on the following : 3×2

i) Cluster analysis

ii) OTU.

OR

c) Give a brief note on Cladistics. 6

d) Write notes on the following : 3×2

i) Phenograms

ii) Aim of numerical taxonomy.

5. a) Describe origin and evolution of angiosperms. 6

b) Write notes on the following : 3×2

i) Monophyly

ii) Cladogram.

OR

[Turn Over

[4]

- c) What is phylogenetic tree ? Describe methods showing evolutionary relationship. 6
- d) Write notes on the following : 3 × 2
- i) Polyphyly
 - ii) homology and analogy.

L-352-9



2019

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Describe important Botanical Gardens of world and India, and their important. 8
- b) Write short notes on the following : 2 × 2
 - i) Virtual herbarium
 - ii) Keys.

OR

- c) What is field inventory and describe the different process of field inventory. 8
- d) Write short notes on the following : 2 × 2
 - i) BSI
 - ii) Binomial nomenclature.

[2]

2. a) Describe the principles and rules of ICN. 8
- b) Write short notes on the following : 2 × 2
- i) Names of hybrids
 - ii) Valid publication.

OR

- c) Write an essay on Typification. 8
- d) Write short notes on the following : 2 × 2
- i) Concept of taxa
 - ii) Taxonomic species concept.
3. a) Give an account of Angiosperm Phylogeny Group (APG III) system of classification. 8
- b) Write short notes on the following : 2 × 2
- i) Taxonomic evidence from molecular data
 - ii) Contribution of de Candolle.

OR

- c) Discuss Engler and Prantl system of classification with merits and demerits. 8
- d) Write short notes on the following : 2 × 2
- i) Phytochemistry in related to taxonomy
 - ii) Merits and demerits of Hutchinson.
4. a) What is numerical taxonomy and describe about OTU. 8
- b) Write short notes on the following : 2 × 2
- i) Cladogram
 - ii) Character weighting.

OR

- c) Give detail account of cluster analysis. 8
- d) Write short notes on the following : 2 × 2
- i) Phenogram
 - ii) Assign polarity.

[4]

5. a) Describe the methods of illustrating evolutionary relationship of Angiosperm. 8
- b) Write short notes on the following : 2 × 2
- i) Homology
 - ii) Parallelism.

OR

- c) Describe origin and co-evolution of angiosperm. 8
- d) Write short notes on the following : 2 × 2
- i) Paraphyly
 - ii) Clades.

2019

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

Give diagrams wherever necessary

1. a) Describe mechanism of opening and closing of stomata. 8
- b) Write short notes on the following : 2 × 2
- i) Importance of water
- ii) Hydathode.

OR

- c) Describe the concept of water potential and its different components. 8
- d) Write short notes on the following : 2 × 2
- ii) Positive root pressure
- iii) Anti-transpirants.

[2]

2. a) Describe the mechanism of transport of ions across cell membrane in plants. 8
- b) Write short notes on the following : 2 × 2
- i) Criteria of essentiality of elements
 - ii) Composition of phloem sap.

OR

- c) What is phloem transport? Describe mechanism of phloem transport with special reference to pressure flow hypothesis. 8
- d) Write short notes on the following : 2 × 2
- i) Deficiency symptoms of nitrogen
 - ii) Pumps.
3. a) What is photophosphorylation and explain process of cyclic and non cyclic photophosphorylation. 8
- b) Write short notes on the following : 2 × 2
- i) Kranz anatomy
 - ii) Significances of photorespiration.

OR

[3]

- c) Outline Hatch and Slack Cycle and point out difference with Calvin cycle. 8
- d) Write short notes on the following : 2 × 2
- i) Quantosomes
 - ii) Photosystem.
4. a) What is a tricarboylic acid ? Narrate TCA Cycle in brief. 8
- b) Write short notes on the following : 2 × 2
- i) Ieheamoglobin
 - ii) pay off of glycolysis.

OR

- c) What are enzymes ? Describe mechanism of enzyme catalysis. 8
- d) Write short notes on the following : 2 × 2
- i) Nitrification
 - ii) Respiratory quotient.

[4]

5. a) What are phytohormones and describe the physiological roles of cytokinin in higher plant. 8
- b) Write short notes on the following : 2×2
- i) long day plants
 - ii) Vernalization.

OR

- c) Describe the discovery and structure of phytochromes. 8
- d) Write short notes on the following : 2×2
- i) Natural Auxin
 - ii) Physiological effect of ethylene.

2022

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Describe RNA as genetic material. 8
- b) Write short notes on the following : 2 × 2
- i) TMV
- ii) Transformation.

OR

- c) Describe DNA as genetic material. 8
- d) Write short notes on the following : 2 × 2
- i) S-type strain
- ii) Findings of Hershey and chase.
2. a) What is RNA ? Discuss the structure of RNA. 8
- b) Write short notes on the following : 2 × 2
- i) Properties of RNA
- ii) m-RNA.

OR

[2]

- c) Discuss the difference between RNA and DNA. 8
- d) Write short notes on the following : 2 × 2
- i) How many DNA do humans have ?
 - ii) Heterochromatin.
3. a) Describe the different processing and modification of eukaryotic mRNA. 8
- b) Write short notes on the following : 2 × 2
- i) Exon
 - ii) Ribozyme.

OR

- c) Describe the mechanism of transcription in eukaryotes. 8
- d) Write short notes on the following : 2 × 2
- i) What molecules are involved in mRNA transport ?
 - ii) Deoxyribonucleic acid.

[3]

4. a) Describe the post-translation modification of protein and fidelity of translation. 8
- b) Write short notes on the following : 2 × 2
- i) Eukaryotes
 - ii) Changing of t-RNA.

OR

- c) Discuss the Ribosome structural and assembly in prokaryotes. 8
- d) Write short notes on the following : 2 × 2
- i) Ribosome assembly
 - ii) Termination codon.
5. a) Describe the role of different eukaryotic transcription factors and heat shock proteins. 8
- b) Write short notes on the following : 2 × 2
- i) Repressor
 - ii) Leader sequence.

OR

[4]

- c) Describe the tryptophan operon system in E.Coli. 8
- d) Write short notes on the following : 2 × 2
- i) Operator
 - ii) Peptide hormones.

L-586-20



2022

Full Marks - 40

Time - 2 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) Discuss the importance of Mushrooms. 4
- b) Write short notes on the following : 2 × 2
- i) *Volvariella volvacea*
- ii) Edible mushroom.

OR

- c) Describe the different types of Mushrooms. 4
- d) Write short notes on the following : 2 × 2
- i) Nutritional value of *Agaricus bisporus*.
- ii) *Pleurotus citrinopileatus*.
2. a) Describe briefly Mushroom cultivation technology. 4

[2]

- b) Write short notes on the following : 2×2
- i) Spawn
 - ii) Inoculation loop.

OR

- c) Describe the different for substrate Mushroom cultivation. 4
- d) Write short notes on the following : 2×2
- i) Sieves
 - ii) Thatched house.

3. a) Describe the composting technology in Mushroom cultivation. 4

- b) Write short notes on the following : 2×2
- i) Medium
 - ii) Sterilization.

OR

c) Give detail account of mushroom bed preparation. 4

[3]

- d) Write short notes on the following : 2×2
- i) Temperature for cultivation of mushroom.
 - ii) Paddy straw bed.
4. a) Give detail account of availability of protein, minerals and vitamins in mushroom for human health. 4
- b) Write short notes on the following : 2×2
- i) Canning
 - ii) Dry weight.

OR

- c) Describe different long term storage technique for the Mushrooms. 4
- d) Write short notes on the following : 2×2
- i) Amino acids in mushroom
 - ii) Vitamins in mushroom.

5. a) Describe different foods prepared from Mushroom. 4
- b) Write short notes on the following : 2×2
- i) Regional research center for Mushroom
 - ii) Give example of two foods are prepared from Mushroom.

OR

- c) Describe the Mushroom marketing in India and abroad with export value. 4
- d) Write short notes on the following : 2×2
- i) Cost benefit ratio
 - ii) National research center in India for Mushroom.

2022

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

Part-I

1. Fill in the blanks :

1 × 8

- a) The greatest herbarium of the world is at ____.
- b) The application of simple mathematical principles or techniques in taxonomical studies of plants is defined as ____.
- c) Taxonomic group of any rank or unit is called ____.
- d) An ____ is a duplicate of the type or holotype.
- e) ____ is known as father of modern Botany.
- f) According to ____ the Ranales were the primitive angiosperms.

- g) _____ is a grouping that includes a common ancestor and all the descendants of that ancestor.
- h) *Michelia Champaca* belongs to family _____.

Part-II

2. Write short notes on any *eight* of the following : 1½ × 8

- a) Virtual Herbarium
- b) E-flora
- c) Valid publication
- d) Major contribution of Theophrastus
- e) Major contribution of Takhtajan
- f) Monophyly
- g) Inflorescence of LAMIACEAE
- h) F.D. of Rubiaceae
- i) Spathe
- j) Velamen.

Part-III

3. Write notes on any *eight* of the following : 2×8
- a) Functions of Herbarium
 - b) Keys to plant systematics
 - c) Typification
 - d) Names of Hybrids
 - e) Contribution of Linnaeus
 - f) Cladogram
 - g) Co-evolution of Angiosperms
 - h) Inflorescence of Magnoliaceae
 - i) Inflorescence of Orchidaceae
 - j) Economic importance of Lamiaceae.

Part-IV

4. a) Describe important Herbaria and botanical gardens of India. 6

OR

- b) Describe various documentation methods of Flora.

[4]

5. a) Describe Taxonomic hierarchy of Angiosperms. 6

OR

b) Describe principles and rules of Botanical nomenclature.

6. a) Describe Bentham and Hooker's system of classification. 6

OR

b) Describe Hutchinson's system of classification.

7. a) Describe the Floral characters of Family *Poaceae*. 6

OR

b) Describe the floral characters of Family *Asclepiadaceae*.