

[This question paper contains 4 printed pages.]

(23)

Your Roll No. 2023

Sr. No. of Question Paper : 1018

D

Unique Paper Code : 2162011101

Name of the Paper : Plant Diversity and Evolution

Name of the Course : Botany

Semester : I

Duration : 2 Hours



Maximum Marks : 60

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **four** questions in all, including question number 1, which is compulsory.
3. **All** questions carry equal marks.
4. All parts of a question must be answered together.
5. Draw diagrams wherever required.

1. (a) Match the following : (1×5)

(i) Ribbon shaped chloroplasts (a) *Selaginella*

(ii) Air bladders (b) *Gnetum*

P.T.O.

- | | |
|--------------------------|----------------------|
| (iii) Resurrection Plant | (c) <i>Sargassum</i> |
| (iv) Presence of vessels | (d) <i>Bacillus</i> |
| (v) Rod Shaped Bacteria | (e) <i>Spirogyra</i> |

(b) Fill in the blanks : (1×5)

- (i) Viruses are composed of a central core of nucleic acid surrounded by a protein coat called a _____ .
- (ii) The ventral surface of the thallus of *Marchantia* bears _____ and _____ scales.
- (iii) Protein monomer of bacterial flagella is called _____ .
- (iv) Ephedra is the source of _____ used for the treatment of asthma.
- (v) Bentham and Hooker's system of classification is an example of _____ system of classification.

(c) Define any **five** of the following : (1×5)

- (i) Transduction

(ii) Plasmid

(iii) Heterospory

(iv) Mycelium

(v) Dolipore septum

(vi) Pollen grain

2. Distinguish between any **three** of the following in a tabular manner and draw diagrams wherever required :

(5×3=15)

(a) Antheridiophore and archegoniophore of *Marchantia*

(b) Lytic and Lysogenic cycle of bacteriophage

(c) Gram positive and Gram negative bacteria

(d) Gymnosperms and Angiosperms

3. Write short notes on any **three** : (5×3=15)

(a) Binary fission in bacteria

(b) Natural selection

(c) Fairy rings

(d) Asexual reproduction in *Marchantia*

4. Draw a well labeled diagram of followings : **(any three)** (5×3=15)
- (a) LS strobilus of *Selaginella*
 - (b) LS basidiocarp of *Agaricus*
 - (c) EM Bacteria
 - (d) LS capsule of *Funaria*
5. (a) Describe the Asexual reproduction in *Rhizopus*.
- (b) Discuss heterospory and seed habit in *Selaginella*.
- (c) Give an account of general characteristics of Angiosperms. (5×3=15)

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Your Roll No. 2023

Sr. No. of Question Paper : 1037

D

Unique Paper Code : 2162011102

Name of the Paper : Cell Biology: Organelles and
Biomolecules

Name of the Course : Botany

Semester : I

Duration : 2 Hours

Maximum Marks : 60



Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. **Question No. 1** is compulsory.
3. Attempt **four** questions in all.

1. (a) Fill in the blanks (**any five**) (1×5=5)

(i) Gunter Blobel and David Sabatini proposed
the _____ .

P.T.O.

- (ii) Marker enzyme for mitochondria is _____.
- (iii) _____ is a lysosomal storage disease.
- (iv) A non-membranous cell organelle is _____.
- (v) Fluid mosaic model of plasma membrane model is proposed by _____.
- (vi) Disulphide bonds are formed in _____.

(b) Define **any five** (1×5=5)

- (i) Reducing sugars
- (ii) Hydrogen bonds
- (iii) Chromatin
- (i) Essential Fatty Acids
- (ii) Nucleoid
- (iii) Heterophagy

(c) Write at least one contribution of the following scientists (1×5=5)

- (i) Linn Margulis

(ii) Rosalind Franklin

(iii) C Benda

(iv) George Palade

(i) Fritz Lipmann

(ii) Christian De Duve

(iii) Camillo Golgi

2. Differentiate between **any three** (5×3=15)

(i) Prokaryotic and eukaryotic cell

(ii) RER and SER

(iii) Primary and Secondary cell wall

(iv) Microtubule and Microfilament

(v) Mitosis and Meiosis

3. Write short notes on **any three** (5×3=15)

(i) Nuclear Pore Complex

(ii) ATP as energy currency molecule

(iii) Peroxisome

(iv) Semi-autonomous nature of chloroplast

4. Draw Ultrastructures of (5×3=15)
- (i) Mitochondria
 - (ii) Nucleus
 - (iii) Fluid Mosaic Model
5. Attempt **any three** (5×3=15)
- (i) Explain the process of regulation of cell cycle.
 - (ii) Give an account of polymorphic forms of lysosomes.
 - (iii) What are the constituents of cell wall? Describe its structure and function.
 - (iv) Explain the role of microtubule in the transport of macromolecules and organelles in the cytoplasm
6. Attempt **any three** (5×3=15)
- (i) Describe the various levels of protein structure.
 - (ii) What are the salient features of DNA structure?
 - (iii) Write a note on lipids as cell membrane constituents.
 - (iv) Write a note of biological significance of chemical bonds.

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Your Roll No

2023

Sr. No. of Question Paper : 1056

D

Unique Paper Code : 2162011103

Name of the Paper : Basic Laboratory and Field
Skills in Plant Biology

Name of the Course : B.Sc. (H) Botany (CBCS)

Semester : I

Duration : 2 Hours



Maximum Marks : 60

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **any four** questions in all
3. Question No. 1 is compulsory
4. Attempt all parts of a question together

P.T.O.

1. (a) Fill in the blanks (**any five**)

(1×5=5)

- (i) _____ holds the specimen in place between the coverslip and the slide.
- (ii) _____ is a device for ventilation while using chemicals producing toxic fumes.
- (iii) A _____ is defined as a concentrate solution to be diluted to some lower concentration for actual use.
- (iv) A _____ is a solid or liquid preparation used to propagate microorganisms under controlled conditions.
- (v) A characteristic that may differ from one individual to another in a population is called a _____ .

(vi) A computerized archive used for the storage and organization of data in such a way that information can be retrieved easily is known as a _____ .

(vii) A value of $\log 100$ is _____ .

(b) Select the **True/False** statement (**any five**)

(5×1=5)

(i) A sample of five body weights (in pounds) is as follows: 116, 168, 124, 132, 110. The sample median is 130.

(ii) In MS excel, the formula Average (number 1, number 2, ...) gives the mean of all values.

(iii) A standard herbarium sheet is 10×20 cm in size.

- (iv) Serial dilution is done to increase the number of bacterial cells per unit volume of a bacterial culture.
- (v) Formalin is an alternative name for an aqueous solution of formaldehyde.
- (vi) Condenser is a glass lens and used to gather the light coming from the source.
- (vii) The concentration of a substance present in a solution can be quantified by measuring light absorbed by it at a particular wavelength.

(c) Match the following

(5×1=5)

Column A	Column B
Electron microscope	Excel
Silver nitrate gel	Sterilization method
Autoclave	Normality
Pie chart	Ultrastructure
Gram equivalent	First-Aid

2. Differentiate between the following (**any 5**)

(3×5=15)

- (a) Compound microscope and Electron microscope
- (b) Sample mean and Population mean
- (c) LB medium and MS medium
- (d) Micrometer and Haemocytometer
- (e) MS Excel and MS Powerpoint
- (f) Molar and Percent Solutions

3. Briefly describe the following (**any five**)

(5×3=15)

- (a) Sampling methods
- (b) Classes of laboratory chemicals
- (c) Laminar Air Flow

(d) Replica plating

(e) Stains in microscopy

(f) Graphical representation of data

4. Write short notes on the following (**any three**)

(3×5=15)

(a) Identification, collection, cataloging and preservation of plant specimens .

(b) Bacterial culture techniques

(c) Agarose Gel electrophoresis

(d) Confocal microscopy

(e) Biosafety measures

5. Answer **any three** of the following: (3×5=15)

- (a) The height of Wheat plants in 10 plots is given below. Calculate the mean and standard deviation of the mean of the height of the wheat plant.

Plot number	1	2	3	4	5	6	7	8	9	10
Height (cm)	9	10	12	8	6	7	11	13	12	12

- (b) Explain disposal of hazardous chemicals and laboratory waste.
- (c) Diagrammatically explain image formation in Fluorescence microscope.
- (d) Discuss the pH of solutions and use of pH meter.
- (e) Draw a bar diagram for the following dataset.

States	Rainfall (mm)
Delhi	617
Haryana	617
Arunachal Pradesh	2782
Punjab	649
Himachal Pradesh	1251
Assam	2818
Jammu & Kashmir	1011
Orissa	1489
Tamil Nadu	998
Tripura	1881