

[This question paper contains 4 printed pages.]

Your Roll No.....

I

Sr. No. of Question Paper : 1373

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.
4. Attempt **all** the parts of a question together.

1. (a) Write at least one contribution of the following scientists (Attempt any **five**) :
(1×5=5)

- (i) Maurice Wilkins
- (ii) Singer and Nicolson
- (iii) Robert Brown
- (iv) Fritz Lipmann

(v) Gunter Blobel and David Sabatini

(vi) George Palade

(b) State whether the following statements are true or false (any **ten**) ($\frac{1}{2} \times 10 = 5$)

- (i) Tertiary structure of proteins involves more than one polypeptide.
- (ii) Sucrose is a disaccharide and has alpha (1-4) bond.
- (iii) Nucleus communicates with the cytoplasm through nucleopores.
- (iv) Cell membranes are composed of amylose and amylopectin.
- (v) Cellulose form the lipid component of the cell walls.
- (vi) Phosphodiglycerides are a part of cell membranes.
- (vii) Golgi bodies are seat of N-glycosylation of lipids.
- (viii) Cholesterol is major constituent of plant cell membrane.
- (ix) Pectin is a constituent of bacterial cell wall.
- (x) Phosphodiester bonds link nitrogenous bases to sugars.
- (xi) Ribosomes are single membrane bound organelles.

(xii) Lysosome helps in protein folding.

(c) Fill in the blanks (Attempt any **five**) : $(1 \times 5 = 5)$

- (i) amino acid participates in the formation of disulphide bonds.
- (ii) Enzymes for oxidative phosphorylation are present on the of mitochondria.
- (iii) The reticular network which traverses the cytoplasm is known as
- (iv) Digestion of old cell organelles like mitochondria is called
- (v) The stage at which crossing over of chromosomes takes place during meiosis I is called.....
- (vi) Hydrophobic proteins tend to have structure

2. Differentiate between any **three** : $(5 \times 3 = 15)$

- (a) B DNA and Z DNA
- (b) Microfilament and Intermediate Filament
- (c) Primary, Secondary and Tertiary Lysosome
- (d) Heterchromatin and Euchromatin

3. Write short notes on any **three** :

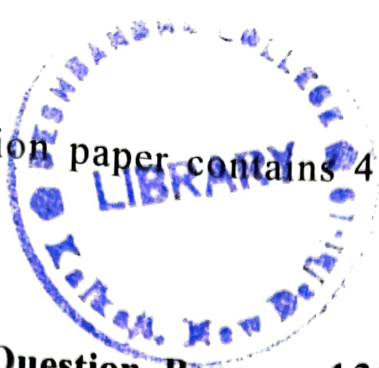
- (a) Semiautonomous Organelles

$(5 \times 3 = 15)$

- (b) Cell Wall
- (c) Biological Significance of Hydrogen Bonds
- (d) Structure and Function of ATP

4. Draw well labelled ultrastructure of any **three** ;
(5×3=15)
- (a) Fluid mosaic model
 - (b) Chloroplast
 - (c) Nuclear Pore complex
 - (d) Flagella
5. (a) Garbage disposal or suicidal bags is a popular expression for one of the cell organelle. Name the organelle and comment on its function.
- (b) Golgi apparatus is the export house of the cell. Comment.
- (c) Explain the process of regulation of cell cycle in eukaryotes.
(5×3=15)
6. (a) What is the role of mitosis in living organisms.
- (b) What is the importance of protein glycosylation and where does it take place?
- (c) Write an account of structure and function of nucleolus.
(5×3=15)

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15/01/25
Your Roll No.....

Sr. No. of Question Paper : 1392

I

Unique Paper Code : 2162011103

Name of the Paper : Basic Laboratory and field skill in Plant Biology

Name of the Course : B.Sc. (H) 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 any **four** questions in all.
 3. Question No. 1 is compulsory.
 4. Attempt all parts of a question together.
-
1. (a) State True or False of the following (**any five**) :
(5×1=5)
 - (i) Agarose gel electrophoresis mainly used to separate nucleic acids based on the molecular size.
 - (ii) The median and the mode of the following data is 44, 49, 44, 54, 42 is 42

P.T.O

- (iii) Using a fume hood without ventilation is an example of bio-safety measures.
- (iv) PCR is a technique to amplify the DNA of a sample.
- (v) Number of moles of solute present in one liter of the solution is called Molality.
- (vi) The goal of fixation is to keep the cells or specimen in the living state for longer duration.
- (vii) Condenser lens collects the electron beam coming out of specimen after interaction and bends them to magnify the image in electron microscope.

(b) Expand the following (**any five**) : (5×1=5)

- (i) HEPA
- (ii) BOD
- (iii) SEM
- (iv) PAGE
- (v) HPLC
- (vi) EDTA
- (vii) YEB

(c) Fill in the blanks (**any five**) : (5×1=5)

- (i) _____ in confocal microscope blocks out-of-focus light from above and below the focal point.

- (ii) To prepare 500 mL of a 2% (v/v) ethanol solution, you would need _____ mL of ethanol.
- (iii) _____ is a measure of data spread or dispersion.
- (iv) _____ is a catalogue to collect and preserve plant specimens.
- (v) _____ is used to analyses and present the data in organized manner.
- (vi) _____ is a workstation used to create a contamination-free and sterilized environment through filters to capture all the particles entering the cabinet.
- (vii) _____ incubator is a specialized equipment used to measure the amount of oxygen consumed by microorganisms in wastewater samples.

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

- (i) LR grade and AR grade chemicals
- (ii) Light microscope and Electron Microscope
- (iii) Pour plate and spread plate technique
- (iv) MS excel and power-point
- (v) Micrometer and Hemocytometer
- (vi) Agarose and SDS-PAGE gel electrophoresis

3. Write short notes on **any three** : (3×5=15)
- (i) Disposal of hazardous waste
 - (ii) Culture media: types and applications
 - (iii) Herbarium
 - (iv) Fire extinguisher
4. (a) Explain the process of serial dilution and how it is used to estimate the concentration of microorganisms in a sample. Include the steps involved and an example calculation. (8)
- (b) Detail the working principle of Spectrophotometer and writes its applications. (7)
5. (a) What is sampling? Briefly describe the different sampling methods? (7)
- (b) What is standard error? Compute the mean, standard deviation, standard error and coefficient of variation of the following data that showed increase in the length of pods of a plant after treatment with a hormone.

Observation	1	2	3	4	5	6	7	8	9	10
Length of pod	4.25	4.20	4.15	3.35	3.25	4.70	3.25	3.75	3.70	3.90

(8)

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09/01/25
Your Roll No.....

Sr. No. of Question Paper : 1353

I

Unique Paper Code : 2162011101

Name of the Paper : Plant Diversity and Evolution

Name of the Course : B.Sc. (Hons.) 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.
3. Question No. 1 is compulsory.
4. Draw well labelled diagrams wherever necessary.

P.T.O.

1. (a) Name the genus having the following (Attempt any five) : (1×5=5)

- (i) Air bladder
- (ii) Ligule
- (iii) Fairy Ring
- (iv) Foliose Lichen
- (v) Gemma cup
- (vi) Maidenhair fern
- (vii) Spiral Chloroplast

- (b) Fill in the blanks (Attempt any five) : (1×5=5)

- (i) The term algae was coined by
- (ii) The reserve food material of red algae is
- (iii) Engler and Prantl system of classification is an example of system of classification.
- (iv) Infectious piece of RNA without protein coat is
- (v) The number of capsomere in TMV is
- (vi) True vessel is found in the Gymnosperm

(vii) Obliquely placed septa are found in rhizoids
of

(1×5=5)

(c) Match the following :

- | | |
|-----------------------------|-------------------------|
| (i) Peltate Columella | (a) <i>Polysiphonia</i> |
| (ii) Heterotrichous thallus | (b) <i>Funaria</i> |
| (iii) Scales | (c) <i>Rhizopus</i> |
| (iv) Collar | (d) <i>Marchantia</i> |
| (v) Operculum | (e) <i>Gnetum</i> |

2. Differentiate between the following (Attempt any
five) : (5×3=15)

- (i) Pteridophytes and Gymnosperms
- (ii) TMV and Bacteriophage
- (iii) Gram-positive and Gram-negative bacteria
- (iv) Natural and Artificial classification
- (v) Megasporophyll and Microsporophyll of
Selaginella

3. Draw the well labelled diagram of the following
(Attempt any three): (5×3=15)

- (i) Diagrammatic sketch of Bacterium

- (ii) *Rhizopus* showing asexual reproduction
- (iii) V.S Receptacle of *Sargassum* showing bisexual conceptacle
- (iv) Morphology of Basidiocarp of *Agaricus*
- (v) Morphology of Male cone of *Gnetum*

4. Write short notes on the following (Attempt any three) :
(5×3=15)

- (i) Scalariform conjugation of *Spirogyra*
- (ii) Bacterial genetic recombination by Transduction
- (iii) Characteristic features of Fungi
- (iv) Bryophytes as amphibians of plant kingdom
- (v) General features of Viruses

5. Attempt any **two** from the following :

- (a) Explain the affinities of Slime molds with Fungi.
(7.5)
- (b) With the help of diagrams, explain briefly the gametophore of *Marchantia*.
(7.5)
- (c) What is heterospory? Explain giving one example.
(7.5)