This question paper contains 6 printed pages.]

Your No.....

Sr. No. of Question Paper : 6461 IIC

Unique Paper Code : 32161101

Name of the Paper : MICROBIOLOGY AND PHYCOLOGY

Name of the Course : **B.Sc. (Hons.) Botany**

Semester : 1

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. All parts of a question must be attempted together.
3. Illustrate your answers with suitable diagrams wherever necessary.
4. This question paper has **SEVEN** questions.
5. **All** questions carry equal marks.
6. Attempt any **Five** questions in all.
7. Question No. **1** is compulsory.

P.T.O.

1. (a) Name the Genus associated with the following (any TEN) : (1×10=10)

(i) Coenobium

(ii) Gongrosira stage

(iii) Cap cells

(iv) Hormogonia

(v) Amylum stars

(vi) Rust of Tea

(vii) Palmella stage

(viii) Triphasic life-cycle

(ix) Root nodule

(x) Crown Gall

(xi) Citrus canker

(xii) Leaf Mosaic

(b) Fill in the blanks : (1/2×6=3)

(i) Cells in *Polysiphonia* thallus are interconnected by _____ .

(ii) In *Nostoc* filament, the heterocyst is _____ in position.

(iii) The fruiting body in *Coleochaete* is called _____ .

(iv) Multiflagellated asexual spore in *Vaucheria* is called _____ .

(v) Bacterium with flagella present on two opposite poles is called _____ .

(vi) The sub-units of protein coat in T.M.V are called _____ .

(c) Give contributions of **any TWO** of the following : (1×2=2)

(i) G.M. Smith

(ii) F.E. Fritsch

(iii) W.M. Stanley

(iv) J. Lederberg and E. Tatum

(a) Comment on the acellular nature of *Vaucheria*. (5)

(b) Elaborate on the evolutionary trends in *Chlamydomonas* or *Coleochaete*. (5)

(c) Discuss the affinities of Red Algae. (5)

OR

Give a brief account of Baltimore's system of classification.

3. (a) Explain Isomorphic Alternation of Generation, with *Ectocarpus* as an example. (5)

(b) Comment on the role of Bacteria in industry. (5)

(c) With the help of diagrams, explain the post-fertilization changes in *Polysiphonia*. (5)

4. Write short notes on **any THREE** of the following : (5×3=15)

(a) Asexual reproduction in *Volvox*

(b) Thallus organization in *Chara*

(c) Sexual reproduction in *Fucus*

(d) Bacterial Growth curve

5. Give well-labelled diagrams for **any THREE** of the following : (5×3=15)

(a) Chara-Detailed structure of a dissected Globule

(b) *Chlamydomonas*- E.M. Cell

(c) *Fuucheria*- Thallus bearing sex organs

(d) T_2 Bacteriophage

6. Differentiate between **any FIVE** of the following :

(a) Hormogonia and Akinetes

(b) Zoospore and Oospore

(c) Unilocular sporangium and Plurilocular sporangium

(d) Macrandrous and Nannandrous

(e) Prions and Virion

(f) Transduction and Transformation (3×5=15)

(a) Describe the symptoms, causal organism and control measures of **any ONE** viral disease. (5)

P.T.O.

(b) Elaborate on the role of Algae in Agriculture and Biotechnology. (5)

(c) Discuss the fine structure and proposed functions of Heterocyst. (5)

OR

Explain Lysogenic Cycle.

This question paper contains 3 printed pages]

Roll No. | | | | | | | | | | |

S. No. of Question Paper : 6462

Unique Paper Code : 32161102 HC

Name of the Paper : **Biomolecules and Cell Biology**

Name of the Course : **B.Sc. (Hons.) Botany**

Semester : I

Duration : **3 Hours** Maximum Marks : **75**

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt *five* questions in all,

including Question No. 1 which is compulsory.

All parts of a question must be attempted together.

1 (*a*) Define (any *five*) : 5×1=5

(*i*) Essential fatty acids

(*ii*) Prosthetic group

(*iii*) Nucleosome

(*iv*) Hydrogen bonds

(*v*) pH

(*vi*) Reducing sugar.

P.T.O.

(*b*) Give the structure of the following (any *five*) : 5×1=5

(*i*) α–D–glucose

(*ii*) Sucrose

(*iii*) Adenine

(*iv*) Sterol

(*v*) Monomeric unit of chitin

(*vi*) D-deoxyribose.

(c) Match the following : 5×1=5

A		B	
(*i*)	Prokaryotic cell	(*a*)	Translation
(*ii*)	tRNA	(*b*)	Mesosomes
(*iii*)	Isoelectric point	(*c*)	Disaccharides
(*iv*)	Lysosomes	(*d*)	Proteins
(*v*)	Lactose	(*e*)	Hydrolases

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

(*a*) Enzyme inhibition

(*b*) Mitochondria and chloroplast as semiautonomous organelles

(*c*) Lipid synthesis in smooth ER

(*d*) ATP as high energy molecule.

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

(*a*) Microfilaments, intermediate filaments and microtubules

(*b*) Primary, secondary and tertiary lysosomes.

(*c*) A-DNA, B-DNA and Z-DNA

(*d*) Starch, glycogen and chitin.

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

(*a*) Ultrastructure of mitochondria

(*b*) Fluid-Mosaic model

(*c*) Nuclear pore complex

(*d*) Ultrastructure of flagella.

5. (*a*) Explain the structure and functions of plant cell wall.

(*b*) What is protein denaturation ? Discuss the biological roles of proteins.

(*c*) Explain in detail the structure and functions of peroxisomes. 5×3=15

6. Give a detailed account of the following (any *two*) : 7½×2=15

(*a*) Role of golgi apparatus as processing, sorting and export centre of proteins.

(*b*) What are lipids ? Describe in detail the major classes of storage and structural lipids, and their roles in living system.

(*c*) Different phases in eukaryotic cell cycle and their regulation by cyclin-cdk complex.

[This question paper contains 6 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 8628 **HC**

Unique Paper Code : 42167902

Name of the Paper : Cell and Molecular Biology

Name of the Course : **Botany : DSE for B.Sc. (Prog.)**

Semester : V

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **5** questions in all.
3. Question No. **1** is compulsory.
4. **All** questions carry equal marks.
5. Answer all parts of a question together.

. (a) Fill in the blanks **(any 5)** : (5)

(i) Existence of lysosomes was for the first time suggested by .....

P.T.O.

(ii) In metaphase the centromeres of each chromosome are aligned midway across the spindle on a plane called the .....

(iii) Extra nuclear DNA is found in by ..... and .....

(iv) Fluid mosaic model was given by ..... and .....

(v) ..... is the semi fluid substance in which the organelles of the cytoplasm are suspended.

(vi) Proteins responsible for unwinding of DNA are .....

(b) Match the following : (5)

(i) Facilitated movement	(a) Arrangement of individual atom within molecule
(ii) Microtome	(b) Division of nucleus
(iii) SEM	(c) Carrier protein
(iv) X-ray Crystallography	(d) 3 D Image/Topography
(v) Karyokinesis	(e) Microscopy sample preparation

(c) Define **(any 5)** (5)

(i) Numerical aperture

(ii) Pachytene

(iii) Ribozymes

(iv) Aminoacyl tRNA

(v) Anticodon

(vi) Inducible operon

2. Write short note on **(any 3)** : (5×3=15)

(a) Replication as a semi conservative process

(b) RNA polymerase

(c) Discuss about the membrane Proteins and their functions.

(d) Nucleosomes

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

(i) Freeze fracture and Freeze etching

(ii) Euchromatin and heterochromatin

(iii) Primary wall and secondary wall

(iv) LM and EM

(v) Mitosis and meiosis

(vi) SEM and TEM

4. (a) Write down the various functions of chloroplast. Name at least two marker enzymes of chloroplasts. (5)

(b) Discuss the Theta mode of replication in prokaryotes. (5)

(c) Write a short note on Phase contrast microscopy. (5)

5. (a) Discuss about the various types of RNA. (5)

(b) Write about the Topoisomerases. (5)

(c) Meiosis and sexual reproduction promote biological diversity. Explain. (5)

6. (a) Describe the Outer and inner mitochondrial membrane. (5)

(b) Discuss the differences in Translation between prokaryotes and eukaryotes. (5)

(c) State whether the following are True or False **(any 5)** (5)

(i) AUG is the start codoe during translation.

(ii) The first cell(s) were thought to have been prokaryotic and heterotrophic.

(iii) During electron microscopy source of electrons is Tungsten filament.

(iv) Measosomes in bacteria are responsible for septum formation.

(v) Janus Green B stain is a vital stain.

(vi) The movement of water across a selectively permeable membrane from an area of higher concentration to an area of lower is osmosis.

(a) Discuss gene expression in Prokaryotes. (5)

(b) Differentiate between Active transport and passive transport. (5)

(c) Describe the Endosymbiotic theory. (5)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 8656 **HC**

Unique Paper Code : 42167902

Name of the Paper : Cell and Molecular Biology

Name of the Course : **Botany : DSE for B.Sc. (Prog.)**

Semester : V

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **5** questions in all.
3. Question No. **1** is compulsory.
4. **All** questions carry equal marks.
5. Answer **all** parts of a question together.

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

   (i) In a compound microscope ..... lens is used to focus the light on the specimen.

   (ii) The stage where crossing over during meiosis I takes place is called ..... .

(iii) ..... coined the term karyotype.

(iv) The prokaryotes occur as individual cells in small clustures or in long chain ..... .

(v) Extrinsic proteins are generally loosely attached to the ..... .

(vi) Golgi received a ..... prize for his cytological findings.

(b) Define **(any 5)** : (1×5=5)

(i) Oligonucleotide

(ii) Euchromatin

(iii) Nucleotide

(iv) Intron

(v) Diakinesis

(vi) Refractive index

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

(i) PCR

(ii) FISH

(iii) TEM

(iv) GERL

(v) Cp DNA

(vi) SER

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

(i) B-DNA and Z-DNA

(ii) Phagocytosis and pinocytosis

(iii) Mitochondrial DNA & Chloroplast DNA

(iv) SER and RER

(v) Purines and Pyrimidines

(vi) Leading strand & lagging strand

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

(i) Fluid-mosaic model of plasma membrane

(ii) Phase-contrast microscopy

(iii) Endosymbiotic theory

(iv) The genetic code is a degenerate code

4. Draw the well labelled Diagram **(any 3)** : (5×3=15)

   (i) Nucleosome

   (ii) Polytene chromosome

   (iii) E.M. of an Animal cell

   (iv) Structure of Mitochondria

5. (a) Discuss about the Griffiths and Avery's Experiment. (5)

   (b) Explain the various modes of DNA replication. (10)

6. (a) Differentiate between the transcription of prokaryotes and eukaryotes. (8)

   (b) Explain the Trytophan operon. (7)

7. (a) Draw the diagrammatic representation of the stages of mitosis. (5)

   (b) Draw the diagrammatic representation of the stages of meiosis. (5)

   (c) Draw and explain the cell cycle of a somatic eukaryotic cell. (5)

[This question paper contains 4 printed pages]

Your Roll No. : .....

Sl. No. of Q. Paper : **7274** **HC**

Unique Paper Code : 32165102

Name of the Course : **Botany : Generic Elective for Honours**

Name of the Paper : Plant Anatomy & Embryology

Semester : I

Time : 3 Hours ***Maximum Marks : 75***

Instructions for Candidates :

(a) Write your Roll No. on the top immediately on receipt of this question paper.

(b) Attempt Section **A** and **B** on Separate sheets.

(c) Question **1** of both sections is Compulsory.

(d) Attempt **three** questions from Section **A** and three questions from Section **B** including question number **1** of both sections.

(e) Attempt **all** parts of the question together.

(f) Draw well labelled diagrams where ever required

P.T.O.

Section - A

5×0.5=2.5

1. (a) Match the following:

(i) Bulliform cells	(a) Monocot stem
(ii) Multiseriate epidermis	(b) Monocot leaf
(iii) Aerenchyma	(c) *Hydrilla*
(iv) Scattered vascular bundles	(d) RAM
(v) Quiescent centre	(e) *Nerium*

(b) Write one word answer of the following (any **five**): 5x1.0=5.0

(i) Type of stomata without subsidiary cell.

(ii) Types of sclereids present in *Nymphaea* petiole.

(iii) Lateral roots originate in this region.

(iv) Parallel venation is characteristic features in leaves of.

(v) Sieve tubes are always accompanied by these cells.

(vi) A vascular bundles in which phloem surrounds the xylem.

(vii) Tunica corpus theory was given by.

2. Write short note on any **three** of the following: 3×5.0=15

(i) Seasonal activity of vascular cambium

(ii) Korpe Kappe theory

(iii)Graminaceous epidermis
(iv) Xylem
(v) Phloem

3. (a) Discuss the types of stomata according to Metcalfe and Chalk's classification. 7.5

(b) Describe briefly different types of simple tissue with the help of well labelled diagrams. 7.5

4. (a) Differentiate between anatomical adaptation of hydrophytes and xerophytes. 7.5

(b) Draw well labelled diagrams of any **three** of the following : 3×2.5 = 7.5

(i) Brachysclereids
(ii) Sieve tube
(iii) V.S. Leaf showing lithocyst
(iv) Vessel member with simple perforation plate

SECTION - B

1.(a) Fill in the blanks (any **five**): 5×0.5=2.5

(i) Ubisch bodies are coated with.....
(ii) Type of ovule found in the family Cactaceae .....
(iii) Coconut water is an example of .....
(iv) Pollination by wind is called.....

(v) Pollen tube contents are usually discharged in .....cells of embryo sac.

(vi) The edible part of litchi is .....

(vii) Anthesis is absent in ..... flowers.

(b) Define any **five** of the following: 5x1.0=5.0

(i) Double fertilization

(ii) Heterostyly

(iii) Anemophily

(iv) Exine

(v) Obturator

(vi) Nucellus

2. Differentiate between any **three** of the following: 3×5=15

(i) Secretory and amoeboid tapetum

(ii) Cellular and nuclear endosperm

(iii) Crassinucellate and tenuinucellate ovules

(iv) Porogamy and Chalazogamy

(v) Microsporogenesis and megasporogenesis

3. Draw well labelled diagram of the following: 3×5=15

(i) T.S. of tetrasporangiate young anther at sporogenous stage

(ii) L.S. anatropous ovule.

(iii) Male germ unit.

4. (a) What is apomixis Discuss its application in agriculture. 7.5

(b) Discuss the structural and functional organization of the embryo sac. 7.5

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 8561 **HC**

Unique Paper Code : 42163512

Name of the Paper : Ethnobotany

Name of the Course : **B.Sc. Life Sciences : Skill Enhancement Course**

Semester : V

Duration : 3 Hours Maximum Marks : 38

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **all** questions.
3. All of their parts together.

1. (a) Define the following terms **(any five)** : (1×5=5)

(i) GPS

P.T.O.

(ii) TKDL

(iii) Participatory forest management

(iv) Herbarium

(v) Paleoethnobotany

(vi) Biopiracy

(b) Write suitable answers of the following : (1×5=5)

(i) A plant used to cure cancer

(ii) A plant which is used in Alzheimer's disease

(iii) Father of Indian Ethnobotany

(iv) A plant which is associated with Lord Vishnu

(v) A plant which is used as insect-repellent

2. Write botanical name, family, part used and ethnobotanical uses of any **four** : (2×4=8)

(i) Neem

(ii) Tiger-claw

(iii) Snake-root

(iv) Ashwagandha

(v) True Indigo

3. (a) Write short note on any **two** : (2.5×2=5)

(i) Major ethnic groups in India

(ii) Gloriosa superba

(iii) Knowledge of ancient literature in ethnobotany

(b) How endangered taxa can be conserved through forestry management practices. (2)

(a) Knowledge is wealth, it expands when we share. Explain it in terms of Ethnobotany. (4)

(b) Explain the role of ethnic groups in conservation of the plant genetic resource. (3)

(a) Discuss the various protection methods of traditional knowledge in India. (4)

(b) What do you understand by the term Ethnobotany and how it is different from Economic Botany ? (2)