

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1507

D

Unique Paper Code : 2162521101

Name of the Paper : Plant Diversity and Systematics

Name of the Course : **B.Sc. (Life Science)**

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, first question is compulsory.
3. **All** questions carry equal marks.
4. Attempt all parts of the questions together.

1. (a) Fill in the blanks : (1×5=5)

(i) Engler and Prantl's classification is
_____ system of classification.

P.T.O.

- (ii) Spiral arrangement of the chloroplast is characteristic feature of algae _____.
- (iii) _____ is also called black bread mold.
- (iv) The _____ cycle ends with the death or lysis of the bacterial cell.
- (v) Determinate or monotelic inflorescence is also called _____.

(b) Match the following :

(1×5=5)

- | | |
|-------------------------|---------------------|
| (i) <i>Nostoc</i> | (a) Cyathium |
| (ii) <i>Pinus</i> | (b) Lysogenic cycle |
| (iii) <i>Marchantia</i> | (c) Heterocyst |
| (iv) Prophage | (d) Needle |
| (v) Euphorbiaceae | (e) Scales |

(c) Define the following (Any five) :

(1×5=5)

- (i) Akinetes
- (ii) Isotype
- (iii) False indusium

(iv) Zygosporangium

(v) Spore

(vi) Elaters

2. (a) Write short notes (Any three) : (3×3=9)

(i) APG

(ii) Mycoplasma

(iii) Fairy rings

(iv) Dwarf shoot

(b) Explain Bentham and Hooker system of classification. (6)

3. (a) Draw well labelled diagram of the following (Any two) : (2×5=10)

(i) V.S. thallus of *Marchantia* through gemma cup

(ii) Bacterial cell

(iii) Part of magnified coenobium in *Volvox*

(b) Describe sexual mode of reproduction in *Spirogyra*. (5)

4. Differentiate between the following (Any three): (3×5=15)

- (i) Conjugation and transduction
- (ii) Gram-positive and Gram-negative bacteria
- (iii) Lytic and lysogenic cycle
- (iv) Artificial and natural classification
- (v) Eusporangiate and Leptosporangiate

5 (a) Discuss the Principle of priority with its limitations. Explain the requirement of valid publication of scientific name of plants. (7.5)

(b) Describe in brief about various modes of reproduction in *Rhizopus*. (7.5)

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Your Roll No.....

Sr. No. of Question Paper : 1714

C

Unique Paper Code : 42164301

Name of the Paper : Plant Anatomy and Embryology

Name of the Course : B.Sc. (programme) Life Science

Semester : III

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 **Section A** and **Section B** on separate sheets.
3. All parts of a question must be answered together.
4. Supplement your answer with well labelled diagram.

SECTION A
(37 marks)

Attempt three questions from
Section A including Question number 1,
which is compulsory.

1. (a) Fill in the blanks (Any four) (4+3=7)
- (i) _____ In collenchyma the thickening material is deposited on the walls bordering the intercellular spaces.
- (ii) The protoxylem vessels generally have _____ and _____ thickening.
- (iii) The histogen theory was given by _____
- (iv) Epidermis that develops multiseriate tissue is called _____.
- (v) Plants growing immersed in water are called _____.

(vi) The wall thickening impregnated with suberin and lignin on the radial and transverse walls of endodermis is called _____.

(b) Define the following terms (**any three**)

(i) Chlorenchyma

(ii) Quiescent centre

(iii) Hypostomatic leaf

(iv) Bulliform cells

(1×3=3)

2. Differentiate between any **three** of the following :

(3×5=15)

(a) Sclereids and fibres

(b) Isobilateral and dorsiventral leaf

(c) Storied and Non-storied cambium

(d) Heart wood and Sap wood

(e) Monocot and dicot root

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

(a) Sclerenchyma

(b) Cytohistological zonation

(c) Vascular Cambium

(d) Secondary growth in stem

(e) Seasonal activity of cambium.

4. (a) What are meristematic tissues? Describe different types of meristematic tissues with example.

(7+8=15)

OR

Define xerophytes. What adaptive features they possess to withstand that environment? (7)

(b) Give a brief account of various theories to describe shoot apical meristem.

OR

Describe Metcalfe and Chalk theory and different types of structural configuration proposed by them. (8)

SECTION B

(38 MARKS)

Attempt three questions from Section B including Question number 1, which is compulsory.

1. Fill in the blanks (**any eight**): (1×8=8)
 - (a) The phenomenon of double fertilization was given by _____
 - (b) Pollination by bats is known as _____
 - (c) Ubisch bodies are produced by _____ tapetum.
 - (d) A small opening at the apical end of the ovule is known as _____

(e) The condition where the stigma loses its receptivity by the time the anthers of the same flower dehisce is known as _____

(f) The phenomenon which involves fusion of nucleus of one of the sperms with the polar nuclei is called _____.

(g) The basal region of an ovule where funiculus is attached is called as _____.

(h) Geitonogamy and xenogamy are the types of _____ pollination.

(i) Finger like projections present in synergid cells are called as _____.

(j) _____ type of embryo sac is genetically most heterogenous.

2. Differentiate between any **three** of the following :

(5×3=15)

(a) Dichogamy and herkogamy

(b) Self pollination and cross pollination

(c) Amoeboid and secretory tapetum

(d) Monosporic and tetrasporic embryo sac

(e) Dicot and monocot embryo

3. Write short notes on any **three** of the following :

(3×5=15)

(a) Egg apparatus

(b) Male germ unit

(c) Double fertilization and triple fusion in angiosperms

(d) Name any five eminent embryologists along with their significant contributions

(e) Anther at dehiscence stage

4. Give a detailed account of different types of endosperm with examples. Discuss embryo-endosperm relationship.

OR

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Discuss different seed dispersal mechanisms and its adaptations in plants.

(15)

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Your Roll No.....

Sr. No. of Question Paper : 1672

C

Unique Paper Code : 42163302

Name of the Paper : Biofertilizers

Name of the Course : **Life Sciences**

Semester : III

Duration : 2 Hours

Maximum Marks : 38

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. This question paper has 7 questions.
3. Attempt 5 questions in all.
4. Question No. 1 is compulsory.
5. All questions carry equal marks except Q. No 1.
6. Answer all parts of a question together.
7. Illustrate your answers with suitable diagram wherever necessary.

1. (a) Fill in the blanks :

(5×0.5=2.5)

(i) Biological nitrogen fixation was discovered by

(ii) The algae has symbiotic association with azolla.

(iii) Mycorrhiza helps plants to absorb

(iv) Vermicast is the of earthworm.

(v) The waste that can be degraded by microorganism are called as

(b) Give the example of the following :

(5×0.5=2.5)

(i) Free living N_2 fixing biofertilizer

(ii) PGPR

(iii) AM fungi

(iv) Associative symbiotic biofertilizer

(v) Green manure

(c) Define the following :

(5×1=5)

(i) Inoculants

(ii) Green manure

(iii) Curing

(iv) Algalization

(v) Vesicle

2. What are major types of bio fertilizers used in agriculture? How are they beneficial over chemical fertilizers? (7)
3. (a) Discuss the Anabaena- Azolla association. (3.5)
- (b) Write an explanatory note on *Rhizobium* isolation and culture technique. (3.5)
4. Write short notes on any two of the following :- (3.5×2=7)
- (a) Organic fertilizers
- (b) Recycling of industrial waste

5. Describe in detail about the types of mycorrhizal association. Write a detailed note on influence of VAM on growth and yield of crop plant. (7)
6. Discuss in detail about the symbiotic and asymbiotic nitrogen fixation. (7)
7. What is vermicomposting? Discuss the process and preparation of vermicompost. (7)

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Your Roll No.....

Sr. No. of Question Paper : 1524 C

Unique Paper Code : 42167902

Name of the Paper : Cell and Molecular Biology

Name of the Course : B.Sc. (P) Life Sciences

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. **All Questions** carry equal marks.
3. **Question No. 1** is compulsory.
4. Attempt five questions in all including **Question No. 1**.

1. (a) Expand (any five)

(i) ORF

(ii) cAMP

(iii) hn RNA

(iv) SER

(v) RF

(vi) snRNP

(1×5=5)

(b) Give one contribution of (any five)

(i) Arthur Kornberg

(ii) Watson

(iii) O. T. Avery

(iv) Har Gobind Khorana

(v) R. Okazaki

(vi) Hershey and Chase

(1×5=5)

(c) Define (any five):

(i) Transcription Factor

(ii) Corepressor

(iii) Initiation factors

(iv) Pribnow Box

(v) Operon

(vi) Chiasma

(1×5=5)

2. Differentiate between (any five):

(i) Light microscopy and Electron microscopy

(ii) rRNA and tRNA

(iii) Positive and negative regulation of Lac operon

(iv) Primary and secondary cell wall

(v) Centromere and Telomere

(vi) Active transport and Facilitated diffusion

(vii) Prokaryotic cell and Eukaryotic Cell

(3×5=15)

3. Write short notes on (any three):

(i) X-ray diffraction :

(ii) Telomerase and its significance

(iii) DNA packaging in eukaryotes

(iv) Endosymbiont Hypothesis

(v) Translation in Prokaryotes

(vi) Endomembrane system

(3×5=15)

4. Draw well labelled diagrams of the following (any three):
- (a) Ultrastructure of chloroplast
 - (b) Attenuation of Tryptophan operon
 - (c) Nuclear Pore Complex
 - (d) Primosome (5×3=15)
5. (a) Give a detailed account of cell cycle and its regulation in eukaryotes. (7)
- (b) Discuss the role of Endoplasmic reticulum in processing and folding of proteins. (8)
6. (a) Give a detailed account of the roles played by Lysosomes and Peroxisomes. (7)
- (b) Elaborate on the various steps of transcription in prokaryotes. How is the transcription process different in Eukaryotes? (8)

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Your Roll No.....

Sr. No. of Question Paper : 1011

D

Unique Paper Code : 2232521101

Name of the Paper : Diversity of Animals
(DSE-3)

Name of the Course : B.Sc. (P) Life Science UGCF

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. Illustrate your answers with diagram wherever necessary.

1. (a) Define the following-

(5)

(i) Schizocoelom

(ii) Biradial symmetry

(iii) Primary host

(iv) Apolysis

(v) Retrogressive Metamorphosis

(b) Give the scientific name for the following: (2)

(i) Venus' flower basket

(ii) Pork tape worm

(iii) House lizard

(iv) Lancelet

(c) Differentiate between the following (2×4=8)

(i) Mature and gravid proglottid

(ii) Torsion and detorsion

(iii) Anadromous and catadromous

(iv) Longitudinal and latitudinal migration

2. (a) Discuss the types of canal system in Porifera.
Add a note on the significance of canal system. (10)
- (b) Explain the ciliary mode of locomotion in Protozoa. (5)
3. (a) Discuss the parasitic adaptations of *Taenia solium*. (8)
- (b) Explain the structure of water vascular system in echinoderms. Add a note on its function. (7)
4. (a) Explain the biting mechanism of venomous snakes. (6)
- (b) Give an account of flight adaptation in birds. (9)

5. (a) Describe osmoregulation of teleost fishes in marine and freshwater? Explain the mechanism of osmoregulation in sharks. (6+2=8)
- (b) Explain the parental care in amphibians with examples. (7)
6. Write short note on ANY THREE of the following: (3×5=15)
- (i) Polymorphism in Hydrozoa
 - (ii) Metamerism in Annelids
 - (iii) Origin of Mammals
 - (iv) Salient features of chordates

3/3/23 (M)

3/3/23 M

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Your Roll No.....

C

Sr. No. of Question Paper : 1638

Unique Paper Code : 42237903

Name of the Paper : DSE: Animal Biotechnology

Name of the Course : B.Sc. (Prog.) Life Sciences,
LOCF

Semester : V, Theory Exam-Nov/Dec,
2022

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 ANY FIVE questions. Question number 1 is compulsory. Substantiate your answer with diagrams wherever necessary.

1. (a) Define the following : (1×5=5)

(i) Transformation

(ii) Biotechnology

(iii) Metagenomics

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(iv) Edible vaccine

(v) Plasmid vector

(b) Write the importance of the following: (4×1=4)

(i) Taq polymerase

(ii) Nitrocellulose membrane

(iii) Ethidium Bromide

(iv) Agarose

(c) Distinguish between : (2×4=8)

(i) Genomic and cDNA library

(ii) Cohesive and Blunt ends

(iii) Probe and Primer

(iv) Transgenic animal and cloned animal

(d) Expand the abbreviations: (1×5=5)

(i) RFLP

(ii) YAC

(iii) GMO

(iv) STR

(v) Taq

(e) Give the contributions of the following scientists.
(1×5=5)

(i) Karry Mullis

(ii) E. M. Southern

(iii) Allec Jeffrey

(iv) Ian Willmut

(v) Neal Burnette

2. Describe DNA microinjection method of production of transgenic animals with appropriate diagrams. What are the major disadvantages of the technique?
(12)

3. (a) Give a brief account of in-vivo gene therapy.
(4)

(b) Explain the method of production of humulin by recombinant DNA technology.
(8)

4. (a) Explain the methodology of Polymerase Chain Reaction in detail with suitable diagrams.
(8)

- (b) Add a note on Real Time PCR. (4)
5. Explain in detail the methodology of molecular diagnosis of sickle cell anaemia in detail with appropriate diagrams. (12)
6. (a) What are DNA modifying enzymes? Discuss the role of any three enzymes used in gene cloning. (7)
- (b) What are cloning vectors? Describe any one in detail. (5)
7. Write short note on **any three** of the following : (3×4=12)
- (i) CRISPR Cas-9
 - (ii) Insecticide resistant transgenic plants.
 - (iii) DNA fingerprinting
 - (iv) Golden rice
 - (v) Metagenomics