

B. Sc. (Hons.) Botany / Semester : II

Title of paper: Archegoniatae (Core)

Unique Code : 32161202

Duration : 3 Hours + 1 hour

Maximum Marks : 75

(Write your University Roll Number, Name of the Paper and Unique Paper code on the top of the Answer sheet).

Attempt any four questions in all. All questions carry equal marks.

1. Enumerate briefly the life cycle of *Sphagnum* with suitable diagrams.
2. Enumerate the characteristic features of Gymnosperms. Give an account of the economic importance of Gymnosperms.
3. Why is Pteridophytes called primitive land plants? Describe the structure of spore producing organ of *Pteris* and the mechanism of sporangial dehiscence with the help of suitable diagrams.
4. Draw a neat diagram of node and internodes of *Equisetum* stem. Mention hydrophytic and xerophytic characters shown by this plant.
5. Discuss the various methods of vegetative reproduction in *Marchantia*. Give a comparative account of thallus of *Riccia*, *Marchantia* and *Anthoceros*.
6. Why *Gnetum* is called a synthetic genus? Compare the structure of ovule of mature *Gnetum*, *Pinus* and *Cycas* with the help of well-labeled diagrams.



This document was created with the Win2PDF "print to PDF" printer available at <http://www.win2pdf.com>

This version of Win2PDF 10 is for evaluation and non-commercial use only.

This page will not be added after purchasing Win2PDF.

<http://www.win2pdf.com/purchase/>

B. Sc. (Hons.) Botany / Semester II

Title of paper: Mycology and Phytopathology (Core)

Unique Code : 32161201

Duration : 3 Hours + 1 hour

Maximum Marks : 75

(Write your University Roll Number, Name of the Paper, Course, Semester and Date of examination on the first page of the answer sheet).

Attempt any four questions in all. All questions carry equal (18.75) marks.

1. What is a heteroecious rust? Describe the causal organism, symptoms, and control measures of black stem rust of wheat.
2. With help of diagram discuss different types of ascocarps formed in Ascomycota. Explain the process of heterokaryosis and parasexual recombination in fungi with the help of diagrams.
3. Discuss the symptoms, causal organism and disease cycle of Early blight of potato with the help of diagrams. Explain the control measures.
4. What are the characteristics of slime molds. Explain different types of plasmodia formed by slime molds with the help of diagrams.
5. Briefly explain the types of lichens. Explain various modes of reproduction in lichens. Discuss the economic and ecological importance of lichens.
6. Elaborate the role of fungi in agriculture and food industry.



This document was created with the Win2PDF "print to PDF" printer available at <http://www.win2pdf.com>

This version of Win2PDF 10 is for evaluation and non-commercial use only.

This page will not be added after purchasing Win2PDF.

<http://www.win2pdf.com/purchase/>

B. Sc. (Hons.) Botany / Semester : IV
Title of paper: Molecular Biology (Core)
Unique Code : 32161401

Duration : 3 Hours + 1 hour

Maximum Marks : 75

(Write your University Roll Number, Name of the Paper, Course, Semester and Date of examination on the first page of the answer sheet)

Attempt any four questions in all. All questions carry equal marks.

1. What is transformation? How did Avery and his colleagues demonstrated that the transforming principle is DNA? Give an account of Watson and Crick's double stranded molecule of DNA. Discuss nucleosome assembly and packaging of DNA into chromosomes in detail with well labelled diagrams. (1+5.75+6+6)
2. What similarities and differences exist in the enzymatic activities of DNA polymerase I and DNA polymerase III? What do you understand by the "end replication problem"? Explain how the telomeres and telomerase help in replicating the ends of linear chromosomes with suitable diagrams. In what ways eukaryotic replication is similar to bacterial replication and in what ways it is different? (6+6.75+6)
3. Discuss an experiment that led to deciphering of genetic code. Explain in details the salient features of the genetic code. Briefly describe exon shuffling. (6.75+6+6)
4. What are repressible and Inducible operons? Discuss the mechanism for regulation of tryptophan system in *E. coli* (9+9.75)
5. Describe the role of spliceosome components at various steps of splicing. Discuss in detail the initiation of translation in prokaryotes and eukaryotes. (9+9.75)
6. Describe the structure of the holoenzyme of bacterial RNA polymerase. Explain with the help of diagrams the two basic types of transcription terminators found in prokaryotes. How is it different from that of eukaryotes? (3+9+6.75)



This document was created with the Win2PDF "print to PDF" printer available at <http://www.win2pdf.com>

This version of Win2PDF 10 is for evaluation and non-commercial use only.

This page will not be added after purchasing Win2PDF.

<http://www.win2pdf.com/purchase/>

B. Sc. (Hons.) Botany / Semester : VI
Title of paper: Plant Biotechnology (Core)
Unique Code : 32161602

Duration : 3 Hours + 1 hour

Maximum Marks : 75

(Write your University Roll Number and Paper Title & Code on top of the Answer Sheet)

Attempt FOUR questions in all. All questions carry equal marks (18.75)

1. Explain in detail the developmental stages of somatic embryogenesis. What are various applications and limitations of somatic embryogenesis? List the major differences between somatic and zygotic embryos.
2. Discuss the role of different phytohormones and vitamins used in plant tissue culture. Explain various methods and significance of germplasm conservation..
3. Using suitable illustrations discuss the methodology of constructing genomic and cDNA libraries. Give brief account of any two methods used to screen a cDNA library.
4. Give salient features of cloning vectors? How do they differ from expression vectors? Give a brief account of one prokaryotic and a phage-based vector commonly used in recombinant DNA technology.
5. Distinguish between selection marker and reporter gene. Discuss in detail any two reporter genes used in plant transformation. Explain various direct gene transfer techniques.
6. Elaborate on one major application of biotechnology with the help of suitable diagram/s in each of the following cases: (a) improved quality traits of crops, (b) pest/ herbicide resistance in plants and (c) genetically engineered products for human welfare.



This document was created with the Win2PDF "print to PDF" printer available at <http://www.win2pdf.com>

This version of Win2PDF 10 is for evaluation and non-commercial use only.

This page will not be added after purchasing Win2PDF.

<http://www.win2pdf.com/purchase/>

B. Sc. (Hons.) Botany / Semester : VI
Title of paper: Plant Metabolism (Core)
Unique Code : 32161601

Duration : 3 Hours + 1 hour

Maximum Marks : 75

(Write your University Roll Number, and Paper Title and Code on top of the Answer Sheet)

Attempt *any four* questions in all. All questions carry equal marks (i.e. 18.75).

1. Compare the photosynthetic electron transport chain with plant respiratory electro transport chain and discuss the mechanism of ATP synthesis. Write an explanatory note on the experiment that established the presence of two photosystems in light reaction.
2. The process of synthesis of glucose from atmospheric carbon dioxide is different in C₃, C₄ and CAM plants. Comment. Write a note on photorespiration.
3. Describe in detail the two pathways which operate in plant cells to oxidize glucose 6-phosphate. Discuss their significance and regulation.
4. Discuss the characteristic features of membrane receptors. Elaborate on the signaling mechanism of G-protein coupled receptors (GPCRs) and Ion-channel linked receptors.
5. Enumerate the steps in fixation of molecular nitrogen. Briefly explain the biochemistry of nitrogen fixation with special reference to characteristics of nitrogenase enzyme.
6. Give a detailed account of the biosynthesis of triglycerides in plants.

B. Sc. (Hons.) Botany / Semester : IV

Title of paper: Biofertilizers (SEC)

Unique Code : 32163403

Duration : 2 Hours + 1 hour

Maximum Marks : 38

(Write your University Roll Number, Paper Title and Unique Paper Code on top of the Answer Sheet)

Attempt any four questions in all. All questions carry equal marks.

1. Discuss the role of Microbes as a biofertilizer in detail, with the help of well-labelled diagrams (9.5)
2. What do you understand by Actinorrhizal symbiosis. How it is different from Mycorrhizal symbiosis? Describe the various methods for isolation and culture of microorganism involved in Actinorrhizal symbiosis. (9.5)
3. Describe the characteristic features of *Azospirillum*. With the help of flow chart, describe the methods of isolation and culture for *Azospirillum* from soil. Comment on its advantages as biofertilizer. (9.5)
4. i) Write short note on Nitrogen fixation. (5.0)
ii) Discuss the role of Cyanobacteria in Rice cultivation. (4.5)
5. Define VAM and explain different types of plant-mycorrhizal associations? Mention the various applications of AM for the enhanced growth and yield of crops. (9.5)
6. What is vermicompost? Describe the any one method and processing of vermicompost. Explain the significance of composting over the chemical fertilizers. (9.5)



This document was created with the Win2PDF "print to PDF" printer available at <http://www.win2pdf.com>

This version of Win2PDF 10 is for evaluation and non-commercial use only.

This page will not be added after purchasing Win2PDF.

<http://www.win2pdf.com/purchase/>

B. Sc. (Hons.) Botany / Semester VI
Title of paper: Bioinformatics (DSE)

Unique Code : 32167608

Attempt four questions in all. All questions carry equal (18.75) marks.

Attempt all parts of the questions together.

Write your roll number on top of answer sheet.

1. Expand INSD and describe about this collaboration. Give a comparative account on the various data submission and retrieval tools of NCBI, EMBL and DDBJ. (1+5.75 + 12)
2. What are the tools available at NCBI for nucleotide sequence analysis? Enumerate your answer with flowchart/s / diagram/s. Explain the specialized tools of NCBI? Generate manually all the six reading frames, and identify different possible ORFs (marking the start and stop codon) for the given nucleotide sequence.

CGCTACGTCTTACGCTGGAGCTCTCATGGATCGGTCGGTAGGGCTCGATCACATCGCTAGCCAT
(6+6.75+6)

3. What is multiple sequence alignment. Name two important tools used for multiple sequence alignment. Why scoring matrices are essential for multiple sequence alignment. Discuss various commonly used scoring matrices. (1+2+5+10.75)
4. Define Bioinformatics and name its closely related branches. Describe the aims and scopes in the area of bioinformatics. (1+3+ 6+ 8.75)
5. What is Molecular phylogeny and briefly enumerate the processes of constructing molecular phylogeny? Give a comparative account of the three main classes of phylogenetic methods for constructing phylogenies. (2+6+10.75)
6. Discuss the role of bioinformatics in crop improvement and microbial genome applications. (9.25 +9.5)



This document was created with the Win2PDF "print to PDF" printer available at <http://www.win2pdf.com>

This version of Win2PDF 10 is for evaluation and non-commercial use only.

This page will not be added after purchasing Win2PDF.

<http://www.win2pdf.com/purchase/>

B.Sc. (Hons.) BOTANY / VI Semester

Title of the Paper : Industrial and Environmental Microbiology (DSE)

Unique Paper Code: 32167601

Time: 3 Hours+ 1 hour

Maximum Marks: 75

(Write your University Roll Number, Paper Title and Code on top of the Answer Sheet)

Attempt any four questions in all. All questions carry equal marks (i.e. 18.75).

1. Why are microbes considered the most ideal organisms in commercial enterprise? Discuss the procedure for isolation of a microorganism producing a new compound.
2. Explain various operational modes of a bioreactor. Why is fed batch mode considered the most efficient in production of antibiotics?
3. What do you understand by product recovery and product purification in downstream processing? Under what conditions is cell lysis performed?
4. Discuss the significance of aerospora. Give principle, procedure of settle plate technique citing the examples of indoor and outdoor environment.
5. How are coliforms detected in water? What is most probable number (MPN) method? Write the advantages of MPN method.
6. What happens to starch when amylase acts on it? Explain the procedure for qualitative and quantitative estimation of amylase activity.



This document was created with the Win2PDF "print to PDF" printer available at <http://www.win2pdf.com>

This version of Win2PDF 10 is for evaluation and non-commercial use only.

This page will not be added after purchasing Win2PDF.

<http://www.win2pdf.com/purchase/>

B.Sc. (Hons.) BOTANY / VI Semester

Title of the Paper : Industrial and Environmental Microbiology (DSE)

Unique Paper Code: 32167601

Time: 3 Hours+ 1 hour

Maximum Marks: 75

(Write your University Roll Number, Paper Title and Code on top of the Answer Sheet)

Attempt any four questions in all. All questions carry equal marks (i.e. 18.75).

1. Why are microbes considered the most ideal organisms in commercial enterprise? Discuss the procedure for isolation of a microorganism producing a new compound.
2. Explain various operational modes of a bioreactor. Why is fed batch mode considered the most efficient in production of antibiotics?
3. What do you understand by product recovery and product purification in downstream processing? Under what conditions is cell lysis performed?
4. Discuss the significance of aerospora. Give principle, procedure of settle plate technique citing the examples of indoor and outdoor environment.
5. How are coliforms detected in water? What is most probable number (MPN) method? Write the advantages of MPN method.
6. What happens to starch when amylase acts on it? Explain the procedure for qualitative and quantitative estimation of amylase activity.



This document was created with the Win2PDF "print to PDF" printer available at <http://www.win2pdf.com>

This version of Win2PDF 10 is for evaluation and non-commercial use only.

This page will not be added after purchasing Win2PDF.

<http://www.win2pdf.com/purchase/>

B. Sc. (Hons.) Botany / Semester : IV
Title of paper: Plant Systematics (Core)
Unique Code : 32161403

Duration : 3 Hours + 1 hour

Maximum Marks : 75

Instructions for the Candidates:

Write the following on the first page.

Date and time of examination DD/MM/YYYY
Examination roll number
Name of the programme
Semester
Unique paper code (UPC)
Title of the paper

Attempt **any four** questions. **All questions carry equal marks (18.75)**

1. Herbarium visits are an essential part of taxonomic studies. In what way do you think such visits enhance your understanding of plant taxonomy? Give an account of Flora and Monograph. Explain different types of multi-entry keys.
2. Give a detailed account of basal angiosperms. Discuss whether angiosperms are considered to be monophyletic or polyphyletic in origin? Explain any two theories regarding the possible ancestors of Angiosperms.
3. Define classification. Mention the differences between natural and phylogenetic systems of classification. Outline the Bentham and Hooker's system of classification and enumerate its merits and demerits. Comment on APG IV classification.
4. What is numerical taxonomy? Discuss its principles and procedure. In what way is it different from cladistics ? In what way is a phenogram different from cladogram.
5. 'Systematics is an interdisciplinary science'. Discuss how evidence from palynology has helped in establishing a better understanding of the affinities between plants. How has molecular data helped in establishing relationships among various taxa?
6. Elaborate the principle of typification and explain different types. Following are the four names of a species based on the same type specimen. Which one is the correct name for the species? Justify your answer.

Cerbera thevetia L. , 1753

Cerbera peruviana Pers. , 1805

Cascabela peruviana (Pers.) Raf., 1838

Cascabela thevetia (L.) Lippold , 1980



This document was created with the Win2PDF "print to PDF" printer available at <http://www.win2pdf.com>

This version of Win2PDF 10 is for evaluation and non-commercial use only.

This page will not be added after purchasing Win2PDF.

<http://www.win2pdf.com/purchase/>