

Total No. of Questions : 7]

SEAT No. :

PD-3429

[Total No. of Pages : 2

[6482]-11

M.Sc. (Part - I)

BOTANY

BOUT 111 : PLANT SYSTEMATICS - I
(2019 Pattern)(Credit System)(Semester - I)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Q.no. 1 is compulsory.*
- 2) *Solve any Five questions from Q.2 to Q.7.*
- 3) *Q.2 to 7 carry equal marks.*

Q1) Solve any Five of the following :

[10]

- a) Distinguishing characters of cyanophyta.
- b) Give medicinal uses of algae.
- c) Describe thallus structure in myxomycotina.
- d) Describe structures of fungal cell.
- e) Give antimicrobial applications of Bryophytes.
- f) Write contribution of any one Indian Bryologists.

Q2) a) Write evolution of sex in algae.

[7]

b) Comment on mode of perennation in algae.

[5]

Q3) a) Describe thallus structure and fructification in Ascomycotino.

[7]

b) Write contribution of fungal studies in India.

[5]

P.T.O.

- Q4)** a) Describe sporophyte of Calobryales. [7]
b) Give contribution of Bryologist in India [5]
- Q5)** a) Describe structure and reproduction in Charophyta. [7]
b) Write distinguishing characters and thallus structure in Basidiomycotina. [5]
- Q6)** a) Describe cell structure and hyphal modifications in fungi. [7]
b) Describe reproductive organs in Marchantiales. [5]
- Q7) Write a short notes on Any Two of the following :** [12]
a) Give an account of sporophyte of order Polytrichales.
b) Give an outline classification of fungi as per Ainsworth et. al. (1973)
c) Describe Reproduction in Rhodophyta.



Total No. of Questions : 7]

SEAT No. :

PD-3430

[Total No. of Pages : 2

[6482]-12
M.Sc.(Part - I)
BOTANY
BOUT-112: Cell Biology and Evolution
(CBCS-2019 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidate:

- 1) *Q. 1 is compulsory.*
- 2) *Solve any five questions from Q. 2 to Q. 7.*
- 3) *Questions 2 to 7 carry equal marks.*

Q1) Solve any five of the following :

[10]

- a) What is the difference between purines & Pyrimidines?
- b) What is the fate of cell, if the organisation of cell is destroyed?
- c) What is glycocalyx?
- d) What is the role of plasmodesmata?
- e) What are cellular junctions?
- f) Mention types of protein kinases.

Q2) a) Describe genetic control of apoptosis.

[7]

b) Explain the role of anaerobic metabolism in evolution.

[5]

Q3) a) Discuss the concept of molecular clocks

[7]

b) Explain the evolutionary time scale

[5]

P.T.O.

- Q4)** a) Explain the molecular mechanism of transport across chloroplast. [7]
b) Describe different molecular events taking place during the cell cycle[5]
- Q5)** a) Discuss ultrastructure and biogenesis of cell wall [7]
b) Explain G-Protein receptors. [5]
- Q6)** a) Describe signaling mechanism of ABA induced stomatal closure. [7]
b) Describe the concept of natural evolution. [5]
- Q7)** Write short notes on any two of the following : [12]
- a) Lamarkism
- b) Phospholipids and its role in plasma membrane
- c) Secondary messengers



Total No. of Questions : 7]

SEAT No. :

PD-3431

[Total No. of Pages : 2

[6482]-13

F.Y.M.Sc. (Part - I)

BOTANY

**BOUT-113 : Cytogenetics and Plant Breeding
(2019 Pattern) (CBCS) (Semester - I) (Paper - III)**

Time : 3 Hours]

[Max. Marks :70

Instructions to the candidates :

- 1) *Question 1 is compulsory.*
- 2) *Attempt any Five questions from Q.2 to Q.7*
- 3) *Questions 2 to Q.7 carry equal marks.*
- 4) *Figures to the right indicates full marks.*

Q1) Solve any five of the following :

[10]

- a) State the mendal's law of dominance.
- b) What is ideogram?
- c) What is apomixis?
- d) Define mutation.
- e) Enlist the plant genetic resources.
- f) Define plant breeding.

Q2) a) Explain the plastid inheritance in Mirabilis jalapa.

[7]

b) Describe the applications of mendelian genetics.

[5]

Q3) a) Describe the structural alterations of chromosome.

[7]

b) Explain the lytic & lysogenic cycle in phases.

[5]

P.T.O.

- Q4)** a) Define selection & give the procedure for pure line & mass selection. [7]
b) Write a note on Ex-situ & In-situ germplasm conservation. [5]
- Q5)** a) Explain the mechanism of action of physical & chemical mutagen. [7]
b) Write a note on nutraceuticals & industrial products [5]
- Q6)** a) Describe the gene mapping by tetrad analysis with any one suitable example. [7]
b) Explain the chromosomal banding technique. [5]
- Q7)** Write short notes on any two of the following : [12]
a) TILLING
b) Selection methods in asexually propagated crop
c) Importance of NBPGR.



Total No. of Questions : 5]

SEAT No. :

PD3432

[Total No. of Pages : 2

[6482]-14

M.Sc. - I

BOTANY

**BODT - 114 : Biofertilizer and Algal Technology
(2019 Pattern) (Semester - I)**

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Question 1 is compulsory.*
- 2) *Attempt any three questions from Q.2 to Q.5.*
- 3) *Questions 2 to 5 carry equal marks.*

Q1) Solve any five of the following. [5]

- a) What is algal technology?
- b) Enlist various strains of rhizobium.
- c) What is bio - hydrogen.
- d) Enlist the algal form used in biofertilizer production.
- e) Define heterocyst.
- f) Enlist strains used for PCB.

Q2) a) Describe endomycorrhizae as a biofertilizer. [6]

b) Write on Azospirillum as a biofertilizer. [4]

Q3) a) Explain Azotobacter as a biofertilizer. [6]

b) Write on production of bio - hydrogen from algae. [4]

Q4) a) Discuss agronomic importance of biofertilizer. [6]

b) Write on applications of seaweed fertilizers. [4]

Q5) Write short notes on any two of the following. [10]

- a) Applications and Importance of SCP.
- b) Process of sterilization and multiplication of mycorrhizae.
- c) Process of Algal cultivation.



P.T.O.

Total No. of Questions : 5]

PD3432

[6482]-14

M.Sc. - I

BOTANY

**BODT - 114 : Pomoculture and Fruit Processing Technology
(2019 Pattern) (Semester - I) (Paper - IV)**

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Question 1 is compulsory.*
- 2) *Attempt any three questions from Q.2 to Q.5.*
- 3) *Question 2 to 5 carry equal marks.*

Q1) Solve any five of the following. **[5]**

- a) What is bahar treatment?
- b) Define plant growth substances.
- c) Give advantages of sexual reproduction.
- d) What is maturity indices.
- e) Enlist uses of peel oil.
- f) Give advantages of hexagonal system.

Q2) a) Give classification of fruits based on climatic adaptability and fruit morphology. **[6]**

b) Write on utilization of by product waste. **[4]**

Q3) a) Explain the process of production of alcoholic drinks. **[6]**

b) Give importance of nutritional values of fruits in human nutrition. **[4]**

Q4) a) Give an account of layout of orchards. **[6]**

b) Describe methods of preservation of fruits and its products. **[4]**

Q5) Write short notes on any two of the following. **[10]**

- a) Botanical classification of fruits.
- b) Pruning and training.
- c) Fruit bud differentiation.



Total No. of Questions : 7]

SEAT No. :

PD-3433

[Total No. of Pages : 2

[6482]-21
F.Y. M.Sc. - I
BOTANY
BOUT 121 : Plant Systematics - II
(2019 Pattern) (CBCS) (Semester - II) (Theory) (Paper - I)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates :

- 1) *Question 1 is compulsory.*
- 2) *Attempt any five questions from Q.2 to Q.7.*
- 3) *Question 2 to 7 carry equal marks.*
- 4) *Figures to the right indicate full marks.*

Q1) Solve any Five of the following : **[10]**

- a) Write the economic importance of pteridophytes.
- b) What is Apospory?
- c) Write any two affinities of Gymnosperms with Angiosperms.
- d) Write any four characters of class cycadales.
- e) Give importance of classification.
- f) What is monophyly?

Q2) a) Give the classification of pteridophytes as per sporne (1975). **[7]**

b) Explain the morphology of family Acanthaceae. **[5]**

Q3) a) Give the morphology and affinities of Gnetales. **[7]**

b) Write distinguishing characters of family Nymphaeaceae. **[5]**

Q4) a) Write the diagnostic characteristics and economic importance of family Araceae. **[7]**

b) Give the affinities of Gymnosperms with pteridophytes. **[5]**

P.T.O.

Q5) a) Give the comparative account of morphology and anatomy of cycadales and Ginkgoales. [7]

b) Explain the morphology of sporophytes of selaginellales. [5]

Q6) a) Give the general characters of Ginkgoales. [7]

b) Explain in brief origin and evolution of Angiosperms. [5]

Q7) Write short notes on any Two of the following : [12]

a) Merits and demerits of Bentham & Hooker's classification system.

b) Heterospory and seed habit.

c) Cronquist system of classification.



Total No. of Questions : 7]

SEAT No. :

[Total No. of Pages : 2

PD3434

[6482]-22

M.Sc.-I

BOTANY-I

**BOUT - 122 : Molecular Biology
(CBCS 2019 Pattern) (Semester -II)**

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Question 1 is Compulsory.*
- 2) *Attempt any five questions from Q.2 to Q.7.*
- 3) *Question 2 to 7 carry equal marks.*

Q1) Solve any five of the following.

[10]

- a) Enlist any two DNA degrading enzymes
- b) What is PCR?
- c) Define C-value paradox
- d) Define transcription
- e) What is negative gene regulation?
- f) What are transposable elements?

Q2) a) Explain the post transcriptional events

[7]

b) Write a note on DNA sequencing

[5]

Q3) a) Discuss the role of DNA modifying enzymes?

[7]

b) Write a note on IS elements.

[5]

Q4) a) Explain the various blotting techniques.

[7]

b) Write a note on nucleotide excision repair

[5]

P.T.O.

- Q5)** a) What is gene regulation? Explain gene regulation [7]
b) Describe the process of protein folding [5]
- Q6)** a) Describe mechanism of DNA replication [7]
b) Comment on packaging of DNA in eukaryotes. [5]
- Q7)** Write a short note on any two of the following. [12]
a) Scope and Applications of molecular biology
b) Objectives of Proteomics
c) Organization and structure of prokaryotic gene



Total No. of Questions : 7]

SEAT No. :

[Total No. of Pages : 2

PD3435

[6482]-23

M.Sc. (Part - I)

BOTANY

BOUT-123: Biochemistry

(CBCS 2019 Pattern) (Semester - II) (Paper - III)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Q.1 is compulsory.*
- 2) *Solve any five questions from Q.2 to Q.7.*
- 3) *Q.2 to Q.7 carry equal marks.*
- 4) *Figures to the right indicate full marks.*

Q1) Solve any five of the following. [10]

- a) Write any four properties of water.
- b) Mention the structural components of nucleic acid.
- c) Give the example of aromatic amino acid.
- d) Define secondary Metabolites.
- e) Give the therapeutic plant sources of phenolics.
- f) What is Molarity.

Q2) a) Give the general classification of enzyme and explain with suitable example. [7]

b) Describe the mechanism of nitrate assimilation in plant. [5]

Q3) a) What is terpenes? Describe the biosynthesis of terpenes. [7]

b) Describe the mechanism of enzyme action. [5]

Q4) a) Describe Handerson - Hasselbalch equation. [7]

b) Explain the properties of carbohydrates with suitable example. [5]

Q5) a) What is root nodulation? Explain the process of nitrogen fixation with neat labelled diagram. [7]

b) Explain different types of lipids with suitable example. [5]

P.T.O.

Q6) a) Describe the biosynthetic pathway of purine. [7]

b) Explain different methods of extraction of plant Metabolites. [5]

Q7) Write short notes on any two of the following. [12]

a) Myoglobin and Keratin.

b) Enzyme inhibition.

c) Ionization of water.



Total No. of Questions : 5]

SEAT No. :

PD3436

[Total No. of Pages : 4

[6482]-24

M.Sc. - I

BOTANY

BODT-124 (A) : Floriculture and Nursery Management

(2019 Pattern) (CBCS) (Semester -II) (Paper-IV)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Q.1 is compulsory.*
- 2) *Attempt any Three questions from question No.2 to 5.*
- 3) *Question No.2 to 5 carry equal marks.*
- 4) *Figures to the right indicate full marks.*

Q1) Attempt any five of the following:

[5]

- a) What is cutflower?
- b) Define surface dressing of soil.
- c) Write about layout of nursery.
- d) What is floriculture?
- e) Define harvesting index.
- f) Give importance of disbudding.

Q2) a) What is flower processing? Explain any one technique of harvesting of flowers in detail. **[6]**

b) Define growing medium. Write about its use and importance in nursery management. **[4]**

Q3) a) Enlist the techniques of vegetative plant propagation used in nursery and explain any one of them. **[6]**

b) Give information regarding Jasmine as loose flower with reference to varietal wealth and export potential. **[4]**

P.T.O.

- Q4)** a) Write about export potential and scope of floriculture in India. [6]
b) What is seed dormancy? Explain pre-treatment methods used for seeds before sowing. [4]

Q5) Write notes on any two of the following. [10]

- a) Methods of seed sowing
- b) Special horticultural practices in floriculture
- c) Removal of top soil in site preparation for nursery



Total No. of Questions : 5]

PD3436

[6482]-24

M.Sc. - I

BOTANY

**BODT-124 (B) : Mushroom Cultivation and Biopesticide Technology
(2019 Pattern) (CBCS) (Semester -II) (Paper-IV)**

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Q.1 is compulsory.*
- 2) *Attempt any Three questions from question No.2 to 5.*
- 3) *Question No.2 to 5 carry equal marks.*
- 4) *Figures to the right indicate full marks.*

Q1) Solve any five of the following: **[5]**

- a) Name any two edible mushrooms.
- b) What is antagonism?
- c) Define mycopesticide.
- d) Mention the substrate used for mushroom cultivation.
- e) What is spawning?
- f) Give any two pests associated with cultivation of mushroom.

Q2) a) Describe the steps involved in cultivation of Button mushroom. **[6]**

b) Give an account of biofertilizers. **[4]**

Q3) a) Explain the concept of biological control of pathogens. **[6]**

b) Give any four nutritional values of mushrooms. **[4]**

Q4) a) Explain the role of biopesticides in detail. **[6]**

b) Discuss management of pest in mushroom cultivation. **[4]**

Q5) Write Short notes on any two of the following.

[10]

- a) Mushroom recepies
- b) Biopesticides
- c) Predation and Parasitism



Total No. of Questions : 7]

SEAT No. :

PD-3437

[Total No. of Pages : 2

[6482]-31

M.Sc. (Part - II)

BOTANY

**BOUT 231 : Computational Botany
(CBCS) (2019 Pattern) (Semester - III)**

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Q.no. 1 is compulsory.*
- 2) *Attempt any Five questions from Q.2 to Q.7.*
- 3) *Q.2 to 7 carry equal marks.*

Q1) Solve any Five of the following :

[10]

- a) What is a Skewness?
- b) What do you mean by correlation and regression.
- c) What is buffers?
- d) State names of database.
- e) Milk production of four dairies per day (lit) are as follows :

Town production	Delhi	Mumbai	Kolkata	Banglure
(in 1000 lit)	700	620	328	640

Prepare a pie chart on the basis of above data
- f) How many ml of 5M H₂SO₄ are required to make 1500ml of 0.002M H₂SO₄ solution.

Q2) a) Describe in detailed steps involved in proposal writing.

[7]

b) Write note on PubMed.

[5]

Q3) a) Explain Duncan's multiple range test.

[7]

b) The theory predict that preportions of beans in a 4 group of A,B,C,D should be 9 : 3 : 3 : 1 in experiment with 1600 beans the no in 4 groups were 882, 313, 287, 118 respectively Does the experiment result support theory?

[5]

P.T.O.

- Q4)** a) Discuss on 'IPR'. [7]
 b) Calculate the standard error of mean of the yield (kg) of honey from ten hives as given below : 1.2, 1.6, 1.4, 2.0, 2.2, 2.9, 2.0, 2.2, 2.1, 2.4 [5]

- Q5)** a) Explain role types of sampling in statistical analysis. [7]
 b) In a grassland community the lichen population was sampled from 10 randomly located plots of 1m square area. The following table given the no of lichen obatined. Find out chi square value. [5]

Area	1	2	3	4	5	6	7	8	9	10
Lichen (m ²)	25	32	17	23	15	39	27	19	22	26

- Q6)** a) Discuss the process of patent submissions. [7]
 b) The length and width of 7 group of plant of species are given below find out karl pearson coefficient of correlation of the two variable. [5]

Length (cm)	11.7	13.9	15.5	17.8	18.5	19.2	22.0
Width (cm)	7.10	12.42	15.85	23.20	28.45	32.25	39.84

- Q7) Write short notes on Any Two of the following :** [12]

- a) NCBI
 b) Methods of sampling
 c) Normal and poison distribution



Total No. of Questions : 4]

SEAT No. :

PD-3438

[Total No. of Pages : 2

[6482]-32

M.Sc.

BOTANY - II

**BOU-232: Developmental Botany
(CBCS) (2019 Pattern) (Semester - III)**

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Q. 1 is compulsory.
- 2) Solve any five questions from Q. 2 to Q. 7.
- 3) Questions 2 to 7 carry equal marks.

Q1) Solve any five of the following :

[10]

- a) What is cell lineage?
- b) What is Juvenility?
- c) Define Induction
- d) Define redifferentiation
- e) What is embryogenesis?
- f) What is cell potency?

Q2) a) Discuss about the effect of intrinsic factors affecting plant development. **[7]**

b) Explain the process of differentiation with suitable examples. **[5]**

P.T.O.

- Q3)** a) What is symmetry? Discuss its types in details. [7]
- b) What is a cell fate? Add a note on cell fate mapping. [5]
- Q4)** a) Define morphogene. Add a note on a role of morphogenetic gradients in plant development with suitable example. [7]
- b) Write a note on megasporogenesis. [5]
- Q5)** a) Explain the process of female gametophyte development. [7]
- b) Write a note on path of pollen tube. [5]
- Q6)** a) Explain the development of Endosperm. Add a note on haustorial Endosperm. [7]
- b) Write about the role of genes involved in root development. [5]
- Q7)** Write short notes on any two of the following : [12]
- a) Vernalization
- b) ABC model of flower development
- c) Polyembryony



Total No. of Questions : 7]

SEAT No. :

PD-3439

[Total No. of Pages : 2

[6482]-33

M.Sc.

BOTANY - II

BOUT 233 : Plant Physiology

(2019 Pattern) (CBCS) (Semester - III)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Q. 1 is compulsory.
- 2) Attempt any Five questions from Q.2 to Q.7.
- 3) Q.2 to 7 carry equal marks.

Q1) Solve any Five of the following :

[10]

- a) Enlist any four properties of water.
- b) Give any two names of natural fertilizers.
- c) What is photo oxidation?
- d) What is photosynthesis? Give types of photosystem.
- e) Define CAM.
- f) Give any two functions of lipids.

Q2) a) Write in detail explanation of soil formation.

[7]

b) Write short note on regulation of C_3 cycle.

[5]

Q3) a) Define respiration. Explain in detail Citric acid cycle.

[7]

b) Explain in brief mechanism of active transport.

[5]

Q4) a) Give detailed account of photosynthetic ETS.

[7]

b) Write a short note on importance of natural fertilizers.

[5]

Q5) a) Give difference between PS-I and PS-II. Add a note on significance of photorespiration.

[7]

b) Comment on significance of lipids.

[5]

P.T.O.

Q6) a) What are PGRs. Add a short note on auxins. [7]

b) Write in brief significance of secondary metabolites. [5]

Q7) Write short note on Any Two of the following : [12]

a) Photo periodism

b) Fatty acid biosynthesis

c) Nitrogen assimilation



Total No. of Questions : 5]

SEAT No. :

PD3440

[Total No. of Pages : 1

[6482]-34

S.Y. M.Sc.

BOTANY

BODT - 234 A : Mycology

(CBCS 2019 Pattern) (Semester - III)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Question 1 is compulsory.*
- 2) *Attempt any three questions from Q.2 to Q.5.*
- 3) *Question 2 to 5 carry equal marks.*

Q1) Solve any five of the following. [5]

- a) Define saprophytic fungi
- b) What is zygosporangium?
- c) Define peritheciomycetes
- d) What is secondary mycelium?
- e) Write two classes belonging to myxomycota.
- f) Which division hymenomycetes belong to?

Q2) a) Describe Ustilaginales fungi. [6]

b) Comment on polypores. [4]

Q3) a) Explain gasteromycetes fungi. [6]

b) Give an account of chytridiomycetes fungi. [4]

Q4) a) Explain vegetative & reproductive structures of myxomycetes. [6]

b) Discuss the order moniliales. [4]

Q5) Write short note on any two of the following. [10]

- a) Loculoascomycetes.
- b) Asexual reproduction zygomycetes.
- c) Significances of Fungi.



Total No. of Questions : 5]

SEAT No. :

PD3441

[Total No. of Pages : 1

[6482]-35

S.Y. M.Sc.

BOTANY

**BODT - 234 B : Taxonomy of Angiosperms
(2019 Pattern) (Semester - III)**

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Question 1 is compulsory.*
- 2) *Attempt any three questions from Q.2 to Q.5.*
- 3) *Question 2 to 5 carry equal marks.*

Q1) Solve any five of the following. **[5]**

- a) Define Biodiversity.
- b) What is Endemism?
- c) Give full form of RAPD.
- d) Define Chemotaxonomy.
- e) What are “Revisions”?
- f) Give any two morphological features used in identification.

Q2) a) Explain principle of priority giving any two examples. **[6]**

b) Write note on important herbarias of the world. **[4]**

Q3) a) Define palynotaxonomy? Give with examples the pollen characters of taxonomic importance. **[6]**

b) Write note on molecular data and systematic position of Hydatellaceae. **[4]**

Q4) a) Describe the role and importance of PCR analysis. **[6]**

b) Give applications of serological data in systematics. **[4]**

Q5) Write short note on any two of the following. **[10]**

- a) TEM and its role in plant systematics.
- b) IUCN and its categories.
- c) Conservation of Biodiversity.



Total No. of Questions : 5]

SEAT No. :

PD3442

[Total No. of Pages : 1

[6482]-36

M.Sc. - II

BOTANY

BODT - 234 C : Plant Ecology

(CBCS 2019 Pattern) (Semester - III)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) Question 1 is compulsory.
- 2) Attempt any three questions from Q.2 to Q.5.
- 3) Question 2 to 5 carry equal marks.

Q1) Solve any five of the following. [5]

- a) What is meta - population?
- b) Define Ecology.
- c) Enlist Characteristics of community.
- d) Enlist Floristic regions of Maharashtra.
- e) Define niche.
- f) What is biogeography?

Q2) a) Describe level of species diversity and its measurement. [6]

- b) Enlist vegetation zones of India. Give its characters and key species of each region. [4]

Q3) a) Describe environmental factors controlling plants distribution. [6]

- b) Give an account of ecological indicator plants. [4]

Q4) a) Define environmental pollution. Describe global environmental change.[6]

- b) Give composition and characteristics of Ecology. [4]

Q5) Write short notes on any two of the following. [10]

- a) Explain life history strategies (R and K selection)
- b) Write a note on carnivory.
- c) Give an account of aquatic ecosystem.



Total No. of Questions : 5]

SEAT No. :

PD3443

[Total No. of Pages : 1

[6482]-37

S.Y. M.Sc.

BOTANY

**BODT - 234 D : Plant Biotechnology
(CBCS 2019 Pattern) (Semester - III)**

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) Question 1 is compulsory.
- 2) Attempt any three questions from Q.2 to Q.5.
- 3) Question 2 to 5 carry equal marks.

Q1) Solve any five of the following. [5]

- a) Define Genetic Engineering.
- b) What are somaclonal variations?
- c) Give two examples of plant derived vaccines.
- d) Define cybrids.
- e) Define Biosafety.
- f) Give two names of fusogen used in protoplast fusion.

Q2) a) What is somatic Hybridization? Give the method of production of somatic Hybrids. [6]

b) Give brief account Intellectual property rights. [4]

Q3) a) Mention any two application of biotechnology in Environment. [6]

b) Give the applications of transgenic plant in abiotic stress resistance. [4]

Q4) a) Comment on transgenic plant in relation to Biosafety issues. [6]

b) Explain the structure of Ti plasmid. [4]

Q5) Write short note on any two of the following. [10]

- a) Protoplast culture
- b) Molecular farming
- c) Rights of plant Breeder's



Total No. of Questions : 5]

SEAT No. :

PD3444

[Total No. of Pages : 1

[6482]-38

S.Y. M.Sc.

BOTANY

**BODT - 234 E : Genetics & Plant Breeding
(CBCS 2019 Pattern) (Semester - III)**

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Question 1 is compulsory.*
- 2) *Attempt any three questions from Q.2 to Q.5.*
- 3) *Question 2 to 5 carry equal marks.*

Q1) Solve any five of the following. [5]

- a) What is probe?
- b) Define transposable elements.
- c) What is synder's ratio?
- d) What is marker assisted selection?
- e) Define partial correlation.
- f) Define IPR.

Q2) a) Describe meteroglyph analysis. [6]

b) Comment on plant Breeder's rights. [4]

Q3) a) Explain the synthetic theory of evolution. [6]

b) Write on the approaches to apply MAS in plant breeding. [4]

Q4) a) Discuss on transposable elements in bacteria. [6]

b) Write applications of Hardy - Weinberg method in plant breeding. [4]

Q5) Write short note on any two of the following. [10]

- a) Q - banding.
- b) Measurement of salinity Resistance.
- c) Geographical Indications.



Total No. of Questions : 5]

SEAT No. :

PD3445

[Total No. of Pages : 1

[6482]-39

S.Y. M.Sc.

BOTANY

BODT - 234 F : Seed Science

(2019 Pattern) (Semester - III) (2 Credits)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Question 1 is compulsory.*
- 2) *Attempt any three questions from Q.2 to Q.5.*
- 3) *Question 2 to 5 carry equal marks.*

Q1) Solve any five of the following. [5]

- a) Define seed technology
- b) What is a seed?
- c) Define seed dormancy.
- d) What is a Tz test?
- e) What is the full form of RAPD?
- f) Define male sterility.

Q2) a) Describe orthodox and recalcitrant seeds in detail. [6]

b) Write scope of seed technology. [4]

Q3) a) Explain types of seed dormancy in detail. [6]

b) Describe structure of monocot seed w.r.t. embryo, endosperm and seed coat. [4]

Q4) a) Discuss quick viability test in detail. [6]

b) What is germination testing? Write paper method in detail for testing germination. [4]

Q5) Write short notes on any two of the following. [10]

- a) Principles of seed production.
- b) Self incompatibility.
- c) Objectives of seed technology.



Total No. of Questions : 7]

SEAT No. :

PD3446

[Total No. of Pages : 2

[6482]-41

M.Sc. -II

BOTANY

**BOUT-241 : Botanical Techniques
(2019 Pattern) (CBCS) (Semester-IV)**

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Question 1 is compulsory.*
- 2) *Attempt any five questions from Q.2 to Q.7.*
- 3) *Questions 2 to 7 carry equal marks.*
- 4) *Neat labelled diagram must be drawn wherever necessary.*
- 5) *Figures to the right indicate full marks.*

Q1) Answer any five of the following.

[10]

- a) Give the importance of Histochemical and Cytochemical techniques.
- b) Write about maceration as a microtechnique.
- c) What is retention time in Chromatography.
- d) Write the properties of electromagnetic radiations.
- e) Mention role of Flurochromes used in radioactive technique.
- f) What is EMBEL?

Q2) a) Explain the Principle, Working and applications of scanning Electron Microscopy. **[7]**

b) Describe principle and applications of Gel filtration Chromatography. **[5]**

Q3) a) Describe principle working and applications of spectro flurometry. **[7]**

b) Explain the different factors affects on centrifugation. **[5]**

Q4) a) Explain principle, working and applications of IR Spectroscopy. **[7]**

b) Explain TLC chromatography with its applications. **[5]**

P.T.O.

- Q5)** a) Describe principle, working and applications of ultra centrifugation technique. [7]
b) Describe in detail microtomy. [5]
- Q6)** a) Explain principle, working and applications of electron microscopy. [7]
b) Describe principle and applications of 2- Dimensional Gel electrophoresis. [5]
- Q7)** Write short notes on any two of the following. [12]
a) X-ray crystallography.
b) Pulsed field Gel Electrophoresis.
c) Rocket immuno Electrophoresis.



Total No. of Questions : 7]

SEAT No. :

PD3447

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M.Sc. (Part-II)

BOTANY

BOU-242 : Advanced Ecology

(2019 Pattern) (Semester -IV)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Question 1 is Compulsory.*
- 2) *Attempt any five questions from Q.2 to Q.7.*
- 3) *Question 2 to 7 carry equal marks.*
- 4) *Neat labelled diagrams must be drawn wherever necessary.*
- 5) *Figures to the right indicate full marks.*

Q1) Answer any five of the following.

[10]

- a) What is species rarefaction?
- b) Enlist the forest types of India.
- c) Define Restoration ecology.
- d) Name any two endangered flora.
- e) What is carrying capacity?
- f) What is Environmental management plan?

Q2) a) Explain plant-microbes Interaction with suitable examples.

[7]

b) Explain manne wate ecology.

[5]

Q3) a) Describe in details Agroecological zones of India.

[7]

b) Discuss Restoration ecology.

[5]

Q4) a) Explain Environmental Impact Assessment.

[7]

b) Write a note on Methods in field ecology.

[5]

P.T.O.

- Q5)** a) What is ecosystem & Discuss types of Ecosystem. [7]
b) Discuss wild life protection act-1972. [5]
- Q6)** a) Define Biodiversity & Explain Hotspots in India. [7]
b) Write a note on Bioindicator [5]
- Q7)** Write short notes on any two of the following. [12]
a) Threatened flora of India.
b) Impact of chemical fertilizers on ecosystem
c) National environmental policy 2006



Total No. of Questions : 5]

SEAT No. :

[Total No. of Pages : 1

PD3448

[6482]-43

M.Sc. (Part - II)

BOTANY

**BODT-243(a): Applied Mycology
(2019 Pattern) (Semester - IV)**

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Q.1 is compulsory.*
- 2) *Answer any three questions from Q.2 to Q.5.*
- 3) *Questions 2 to 5 carry equal marks.*
- 4) *Neat labelled diagrams must be drawn wherever necessary.*
- 5) *Figures to the right indicate full marks.*

Q1) Answer any five of the following. **[5]**

- a) What is Mildew?
- b) Define seed pathology.
- c) Write any two examples of Mycofungicides.
- d) What is fungal Metabolites?
- e) Define Industrial Mycology.
- f) Enlist any four name of value added product of Mushroom.

Q2) a) Define Medical Mycology? Explain it's types in brief. **[6]**

b) Write a note on fungi as a plant pathogen. **[4]**

Q3) a) What is Biopesticides? Explain Bioinsecticides in brief. **[6]**

b) Explain fungal food spoilage. **[4]**

Q4) a) Describe role of fungi in fermented food. **[6]**

b) Explain forest pathology and it's significance. **[4]**

Q5) Write short notes on any two of the following. **[10]**

- a) Types of Mycorrhiza.
- b) Types of Mildew.
- c) Production of Different Mushroom.



Total No. of Questions : 5]

SEAT No. :

PD3449

[Total No. of Pages : 1

[6482]-44

M.Sc. (Part - II)

BOTANY

**BODT-243(b): Advanced Medicinal Botany
(2019 Pattern) (CBCS) (Semester - IV)**

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Q.1 is compulsory.*
- 2) *Attempt any three questions from Q.2 to Q.5.*
- 3) *Questions 2 to 5 carry equal marks.*
- 4) *Neat labelled diagrams must be drawn wherever necessary.*
- 5) *Figures to the right indicate full marks.*

Q1) Answer any five of the following. **[5]**

- a) What is Drug adulteration?
- b) Give medicinal properties of Asparagus racemosus.
- c) Write botanical name of any two Aromatic plants.
- d) Give the parameters of Drug evaluation.
- e) Enlist any two examples of Marine Drugs.
- f) What is crude drug?

Q2) a) Write source, Cultivation & Applications of Chlorophytum borivillianum. **[6]**

b) Write a note on Indian trade in Medicinal plants. **[4]**

Q3) a) Explain the immunomodulatory effects of Medicinal plants. **[6]**

b) Write a note on Quality control of herbal Drugs. **[4]**

Q4) a) Write a note on phytopharmaceutical aspects of Medicinal plants. **[6]**

b) Explain Biosynthesis of Alkaloids. **[4]**

Q5) Write short notes on any two of the following. **[10]**

- a) Give the scope of pharmacognosy.
- b) Write a Brief note on Methods for Drug evaluation.
- c) Give source, Cultivation & Applications of Terminalia arjuna.



Total No. of Questions : 5]

SEAT No. :

PD3450

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[6482]-45

M.Sc. (Part - II)

BOTANY

**BODT-243(c): Advanced Plant Physiology
(2019 Pattern) (Semester - IV)**

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Q.1 is compulsory.*
- 2) *Answer any three questions from Q.2 to Q.5.*
- 3) *Questions 2 to 5 carry equal marks.*
- 4) *Neat labelled diagrams must be drawn wherever necessary.*
- 5) *Figures to the right indicate full marks.*

Q1) Answer any five of the following. **[5]**

- a) Enlist any two biotic stress.
- b) Give the names of pigments involved in photoprotection.
- c) What is recombinant DNA Technology?
- d) Give the names of herbicides.
- e) What is stress Physiology?
- f) Mention the name of first stable product of C_3 cycle.

Q2) a) Give the comparative account of C_4 and CAM pathway. **[6]**

b) Describe the storage of vegetables and flowers. **[4]**

Q3) a) Explain the case study for improvement of stress tolerance by conventional and recombinant DNA technology. **[6]**

b) Describe the cyanide resistant respiration. **[4]**

Q4) a) Explain in detail the responses and tolerance mechanisms. **[6]**

b) Explain the role of pigments in photoprotection. **[4]**

Q5) Write short notes on any two of the following. **[10]**

- a) Functioning of photosynthetic ETS in prokaryotes.
- b) Inhibitors of respiration.
- c) Mechanism of action of bactericides.



Total No. of Questions : 5]

SEAT No. :

[Total No. of Pages : 1

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M.Sc. (Part - II)

BOTANY

**BODT-243(d): Industrial Biotechnology
(2019 Pattern) (CBCS) (Semester - IV)**

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Q.1 is compulsory.*
- 2) *Answer any three questions from Q.2 to Q.5.*
- 3) *Questions 2 to 5 carry equal marks.*
- 4) *Neat labelled diagrams must be drawn wherever necessary.*
- 5) *Figures to the right indicate full marks.*

Q1) Answer any five of the following. [5]

- a) Define biotechnology.
- b) What is the riboflavin?
- c) What is primary metabolite?
- d) Define bioremediation.
- e) What is mean by bioleaching?
- f) Enlist any two advantages of environmental biotechnology.

Q2) a) Explain the biosynthesis of riboflavin. [6]

b) Write a note on in - situ bioremediation. [4]

Q3) a) Elaborate the role of AM fungi in bioremediation. [6]

b) What are primary metabolites? [4]

Q4) a) What is fermentation technology? Give its scope and importance. [6]

b) What is nano-catalyst? [4]

Q5) Write short notes on any two of the following. [10]

- a) Applications of biosensors.
- b) Nanofiltration.
- c) Role of biotechnology in food supplements.



Total No. of Questions : 5]

SEAT No. :

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[6482]-47

M.Sc. (Part - II)

BOTANY

**BODT-243(e): Seed Technology
(2019 Pattern) (CBCS) (Semester - IV)**

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Q.1 is compulsory.*
- 2) *Answer any three questions from Q.2 to Q.5.*
- 3) *Questions 2 to 5 carry equal marks.*
- 4) *Neat labelled diagrams must be drawn wherever necessary.*
- 5) *Figures to the right indicate full marks.*

Q1) Answer any five of the following. [5]

- a) Define seed pathology.
- b) What is seed deterioration?
- c) What is seed quarantine?
- d) Give the meaning of seed entomology.
- e) Give the types of seed legislation.
- f) Mention the factors affecting seed storage.

Q2) a) Describe about pre-cleaner and colour separator machines. [6]

b) Describe slurry seed treatment equipment. [4]

Q3) a) Describe any two methods of seed health testing. [6]

b) Explain central seed committee and their function. [4]

Q4) a) Explain general layout of seed processing unit with neat labelled diagram. [6]

b) Explain the cold storage. [4]

Q5) Write short notes on any two of the following. [10]

- a) Central seed committee and their function.
- b) Causes of seed deterioration.
- c) Duties of seed Inspector.



Total No. of Questions : 5]

SEAT No. :

PD3453

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M.Sc. - II

BOTANY

**BODT - 244a : Plant Tissue Culture Technology
(2019 Pattern) (Semester - IV)**

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Question 1 is compulsory.*
- 2) *Attempt any three questions from Q.2 to Q.5.*
- 3) *Questions 2 to 5 carry equal marks.*
- 4) *Neat labelled diagrams must be drawn wherever necessary.*
- 5) *Figures to the right indicate full marks.*

Q1) Answer any five of the following. **[5]**

- a) Define plant tissue culture.
- b) Enlist abiotic elicitors.
- c) What is *Agarobacterium*?
- d) Give any two applications of Haploids.
- e) Enlist different explants.
- f) What is genetic engineering?

Q2) a) Describe protoplast culture technique. **[6]**

b) Explain gene transformation by Electroporation. **[4]**

Q3) a) Discuss with suitable example process of gene transformation by *Agarobacterium*. **[6]**

b) Comment on somatic embryogenesis. **[4]**

Q4) a) Give process of screening & selection of cell lines with examples. **[6]**

b) Explain genetic basis of somaclonal variations. **[4]**

Q5) Write short notes on any two of the following. **[10]**

- a) Micropropagation
- b) Ex-situ conservation
- c) Secondary metabolite modification



Total No. of Questions : 5]

SEAT No. :

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M.Sc. - II

BOTANY

**BODT - 244b : Herbal Technology
(2019 Pattern) (CBCS) (Semester - IV)**

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Question 1 is compulsory.*
- 2) *Attempt any three questions from Q.2 to Q.5.*
- 3) *Questions 2 to 5 carry equal marks.*
- 4) *Neat labelled diagrams must be drawn wherever necessary.*
- 5) *Figures to the right indicate full marks.*

Q1) Answer any five of the following. **[5]**

- a) Define nutraceuticals.
- b) What is probiotics?
- c) Write any two sources of alkaloids.
- d) Give long form of IPR.
- e) Give any two scope of herbal technology.
- f) Write source of polyphenols.

Q2) a) Explain preparation and standardization of Bhasma. **[6]**

b) Write the case study of Curcuma. **[4]**

Q3) a) Explain concept and need of packaging of herbal products. **[6]**

b) Give scope and role of medicinal plants in Unani. **[4]**

Q4) a) Describe herbal plants used in skin care, hair care and dyes. **[6]**

b) Explain phytochemicals as a source of dietary fibre. **[4]**

Q5) Write short notes on any two of the following. **[10]**

- a) Patenting aspects of natural products.
- b) Medicinal plants as sources of glycosides.
- c) Processing of herbal raw materials.



Total No. of Questions : 5]

SEAT No. :

PD3455

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M.Sc. - II

BOTANY

**BODT - 244c : Research Methodology
(2019 Credit Pattern) (Semester - IV)**

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Question 1 is compulsory.*
- 2) *Attempt any three questions from Q.2 to Q.5.*
- 3) *Questions 2 to 5 carry equal marks.*
- 4) *Neat labelled diagrams must be drawn wherever necessary.*
- 5) *Figures to the right indicate full marks.*

Q1) Answer any five of the following questions.

[5]

- a) What is literature review?
- b) Enlist the types of research?
- c) What is secondary data?
- d) What is model organism?
- e) What is ELISA?
- f) Define plagiarism.

Q2) a) What do you mean by research? Explain its significance in modern time. **[6]**

b) Describe the biological problems in physiology. **[4]**

Q3) a) Describe the techniques in poster presentation. **[6]**

b) Write a note on scale bars tool in microscopy. **[4]**

Q4) a) Explain the techniques in field photography. **[6]**

b) Give the importance of abbreviations in scientific report writing. **[4]**

Q5) Write short notes on any two of the following. **[10]**

- a) Proteomics.
- b) Biological problems in cell biology.
- c) Conceptual verses empirical research.

