

Total No. of Questions : 7]

SEAT No. :

PA-3318

[Total No. of Pages : 2

[5915] - 11

M.Sc. - I

BOTANY

**BOUT -111- Plant Systematics-I (Theory)  
(2019 Pattern) (Semester-I) (Paper-I)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**Q1)** Solve any five of the following:

- a) Give two antimicrobial properties of Bryophytes. [2]
- b) Write two distinguishing characters of chytridiomycetes. [2]
- c) Give two medicinal applications of algae. [2]
- d) Give two types of Fructifications in Deuteromycotina. [2]
- e) Give two applications of fungi as biofertilizers. [2]
- f) Define systematics and give its any two principles. [2]

**Q2)** a) Give comparative account of Hemiascomycetes and Euascomycetes. [7]

b) Describe thallus organization in cyanophyta. [5]

**Q3)** a) Explain types of plasmodium and fruit bodies in Myxomycotina. [7]

b) Describe morphology and reproduction in Rhodophyta. [5]

**Q4)** a) Describe the comparative structure and reproduction in Euglenophyta. [7]

b) Explain the theory of reduction of Sporophyte in Bryophytes. [5]

*P.T.O.*

- Q5)** a) Explain morphology and anatomy of sporophyte of funariales. [7]  
b) Describe hyphal modifications and cell structure in fungi. [5]
- Q6)** a) Give distinguishing characters and anatomy of gametophyte of polytrichales. [7]  
b) Explain heterothalism and sexual reproduction in zygomycotina. [5]
- Q7)** write short notes on any two of the following:
- a) Origin and evolution of sex in algae. [6]  
b) Types and structure of basidia and basidiocarps of Basidiomycotina. [6]  
c) Asexual and sexual reproduction in chlorophyta. [6]



Total No. of Questions : 7]

SEAT No. :

[Total No. of Pages : 2

**PA-3319**

**[5915]-12**

**M.Sc. - I**

**BOTANY**

**BOUT-112 : Cell Biology and Evolution  
(CBCS 2019 Pattern) (Semester-I)**

*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) *Question 2 to Q.7 carry equal marks.*

**Q1)** Solve any five of the following.

**[10]**

- a) Phospholipids are amphipatic. Explain.
- b) Mention the role of water in chemical reactions in a cell.
- c) What are oligosaccharides and polysaccharides.
- d) Mention differences between DNA and RNA.
- e) What is Cytoskeleton.
- f) What are secondary Messangers.

**Q2)** a) Discuss the concept of speciation.

**[7]**

b) Explain RNA world theory.

**[5]**

**Q3)** a) Explain the effects of apoptosis on cell - arganelles of the cells.

**[7]**

b) Explain co-evolution.

**[5]**

**Q4)** a) Explain the Molecular aspects of programmed cell-death.

**[7]**

b) Describe different phases of cell-cycle.

**[5]**

**P.T.O.**

- Q5)** a) Explain the Molecular Mechanism of transport across Mitochondria.[7]  
b) Describe Oparine and Haldane concept. [5]

- Q6)** a) Explain the Ultrastructure and functions of Endoplasmic reticulum. [7]  
b) Describe the role of protein and Nucleotide sequencing in Molecular evolution. [5]

- Q7)** Write short notes on any two of the followings: [12]  
a) Gene Pool.  
b) Diversity of GPCR gene family.  
c) Signal transduction.



Total No. of Questions : 7]

SEAT No. :

[Total No. of Pages : 2

**PA-3320**

**[5915]-13**

**M.Sc. -I**

**BOTANY**

**BOU-113 : Cytogenetics and Plant Breeding and Evolution**

**(2019 Pattern) (Credit System) (Semester-I) (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) *Question 2 to 7 carry equal marks.*

**Q1)** Solve any five of the following:

**[10]**

- a) Give concept of gene.
- b) What is B chromosome?
- c) Give importance of E.Coli as a model system.
- d) Give importance of adaptation.
- e) What are cytoplasmic genes?
- f) What is heterozygotic translocation?

**Q2)** a) Describe gene mapping by tetrad analysis in yeast.

**[7]**

b) Explain cytological and genetical method of autopolyploids.

**[5]**

**Q3)** a) Explain the mechanism of conjugation in bacteria.

**[7]**

b) Describe the method of mutation breeding.

**[5]**

**Q4)** a) Describe major events in the evolutionary time scale.

**[7]**

b) Explain the concept of continuous variation.

**[5]**

**P.T.O.**

- Q5)** a) Describe selection method in cross pollinated crops. [7]  
b) Write an account of the origin and evolution of eukaryotic cell. [5]
- Q6)** a) Describe types and causes of mutations. [7]  
b) Write effect of salt toxicity on plants. [5]
- Q7)** Write short notes on any two of the following. [12]  
a) Germplasm types and conservation.  
b) Molecular tools in phylogeny.  
c) Phenomenon of translocation and its importance.



Total No. of Questions : 5]

SEAT No. :

**PA-3321**

[Total No. of Pages : 2

**[5915]-14**

**M.Sc. - I**

**BOTANY**

**BODT-114(A) : Biofertilizers & Algal Technology**

**(2019 Pattern) (Semester-I)**

*Time : 2 Hours]*

*[Max. Marks : 35*

*Instructions to the candidates:*

- 1) *Q.1 is compulsory.*
- 2) *Solve any three questions from Q.2 to Q. 5.*
- 3) *Question No. 2 to 5 carry equal marks.*

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

- a) What is genetically modified organisms?
- b) Define SCP.
- c) Enlist N<sub>2</sub> fixing cyanobaltesia.
- d) What is biofertilizers?
- e) Enlist agar yielding algae.
- f) What is algal technology?

**Q2) a) Describe potential of algae as food & feed . [6]**

b) Comment on PSB as biofertilizers. [4]

**Q3) a) Give application methods of different biofertilizers. [6]**

b) Write applications of seaweed biofertilizers. [4]

**Q4) a) Comment on applications of SCP. [6]**

b) Explain need & significance of biofertilizers. [4]

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

- a) Azospirillum as biopesticides.
- b) Cultivation of algae for biodiesel extraction.
- c) Sterilization techniques for biomass production.



Total No. of Questions : 5]

**PA-3321**

**[5915]-14**

**M.Sc.-I**

**BOTANY**

**BODT-114(B) : Pomoculture and Fruit Processing Technology**

**(2019 Pattern) (Semester-I) (Paper-IV) (CBCS)**

*Time : 2 Hours]*

*[Max. Marks : 35*

*Instructions to the candidates:*

- 1) *Q.1 is compulsory.*
- 2) *Solve 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) Write advantages of hexagonal system.
- b) Enlist fermented products of alcoholic drinks.
- c) Define greening.
- d) Write scope of fruit crops.
- e) Give any two advantages of by product waste utilization.
- f) Write any two problems of fruiting.

**Q2)** a) Explain methods of harvesting technology for ripening. **[6]**

b) Comment on fruit growing plants in Maharashtra. **[4]**

**Q3)** a) Explain vegetative methods of propagation of fruit trees, give its advantages. **[6]**

b) Comment on systems of marketing of fruits. **[4]**

**Q4)** a) Describe the process of preparation of Jam and Jelly. **[6]**

b) Comment on role of any two plant growth substances. **[4]**

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

- a) Methods of training.
- b) Principles of preservation of fruit crops.
- c) Importance of fruit crops.





Total No. of Questions : 7]

SEAT No. :

[Total No. of Pages : 2

**PA-3322**

**[5915]-21**

**M.Sc. -I**

**BOTANY - I**

**BOUT-121 : Plant Systematics-II**

**(CBCS 2019 Pattern) (Semester-II) (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) *Questions 2 to Q.7 carry equal marks.*

**Q1)** Solve any five of the following.

**[10]**

- a) Write any two medicinal applications of pteridophytes.
- b) What is apospory?
- c) Write any two affinities of gymnosperms with pteridophytes.
- d) Define parallelism.
- e) Give economic importance of gymnosperms.
- f) Give any two characteristic features of angiosperms.

**Q2)** a) Explain the morphology and anatomy of sporophyte of psilotales. **[7]**

b) Give the classification of gymnosperms by Raizada and sahani. **[5]**

**Q3)** a) Write general characters of pteridophytes. **[7]**

b) Describe the anatomy of gametophyte of Isoetales. **[5]**

**Q4)** a) Give comparative account of sporogenesis and gametogenesis of cycadales and Ginkgoales. **[7]**

b) Describe morphology of family Magnoliaceae. **[5]**

*P.T.O.*

- Q5)** a) Explain the affinities of pteridospermales. [7]  
b) Give general characters of family Araceae. [5]
- Q6)** a) Give economic importance of family Arecaceae and Asteraceae. [7]  
b) Give the APG IV system of classification. [5]
- Q7)** Write short notes on any two of the following. [12]  
a) Stellar evolution.  
b) Post Darwinian system of classification.  
c) Phylogenetic tree and cladogram.



Total No. of Questions : 7]

SEAT No. :

[Total No. of Pages : 2

**PA-3323**

[5915]-22

**M.Sc.-I**

**BOTANY**

**BOUT-122 : MOLECULAR BIOLOGY**

**(CBCS 2019 Pattern) (Semester-II)**

*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 from 2 to 7 carry equal marks.*

**Q1)** Solve any 5 of the following:

**[10]**

- a) Write two objectives of proteomics?
- b) Define DNA Damage.
- c) Write any two factors of DNA replication.
- d) Define transcription.
- e) Write working principle of incubator.
- f) Enlist classes of promoters.

**Q2)** a) Describe process of transcription prokaryotes.

**[7]**

b) Explain methodologies of proteomics.

**[5]**

**Q3)** a) Explain initiation of protein synthesis in prokaryotes.

**[7]**

b) Justify DNA is the genetic material.

**[5]**

**Q4)** a) Describe the enzymology of DNA replication.

**[7]**

b) Explain maxam-Gilbert sequencing method.

**[5]**

**P.T.O.**

- Q5)** a) Describe the process of pre-mRNA Splicing. [7]  
b) Explain transposons mediated gene tagging. [5]
- Q6)** a) Describe the double helix model of DNA. [7]  
b) Explain protein targetting. [5]
- Q7)** Write short note on any two of the following. [12]  
a) Base excision repair.  
b) Northern blotting.  
c) Attenuation at trp operon.



Total No. of Questions : 7]

SEAT No. :

PA-3324

[Total No. of Pages : 2

[5915]-23

M.Sc.-I

BOTANY

BOUT-123 : Biochemistry

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

*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) Define competitive and non-competitive inhibitors.
- b) What is Ramchandran plot?
- c) Give Functions of myoglobin.
- d) What are nif genes?
- e) Give properties of polysaccharides
- f) What are secondary metabolites.

**Q2)** a) Explain mechanism of breakdown of glucose. **[7]**

b) Give general classification and properties of proteins. **[5]**

**Q3)** a) Describe biosynthesis of purines and pyrimidines. **[7]**

b) Write on biosynthetic pathway of glycosides. **[5]**

**Q4)** a) Describe the reactions of biosynthesis of lipids. **[7]**

b) Give structure and properties of amino acids. **[5]**

*P.T.O.*

**Q5)** a) Write an account of root nodulation and nitrogen fixation. [7]

b) Describe factors affecting enzyme activity. [5]

**Q6)** a) Describe the structure of DNA molecule. [7]

b) Write an account on NOD factors and root nodulation. [5]

**Q7)** Write short note on any two of the following: [12]

a) Ionization of water.

b) Nitrate and ammonium assimilation.

c) Extraction method for alkaloids.



Total No. of Questions : 5]

SEAT No. :

PA-3325

[Total No. of Pages :2

[5915]-24

M.Sc. - I

BOTANY

**BODT - 124 A : Floriculture and Nursery Management  
(CBCS 2019 Pattern) (Semester - II)**

*Time : 2 Hours]*

*[Max. Marks : 35*

*Instructions to the candidates:*

- 1) *Question 1 is compulsory.*
- 2) *Attempt any three questions from Q. No. 2 to Q. No. 5.*
- 3) *Question No. 2 to 5 carry equal marks.*

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

- a) Enlist any four varieties of Gerbera.
- b) What is surface dressing in nurseries.
- c) Give the names of expensive flowers of the world.
- d) Enlist the methods of seed germination.
- e) What is ideal temperature for growing Anthurium.
- f) Give different types of nurseries.

**Q2)** a) Describe the commercial cultivation of Anthurium. **[6]**

b) Comment on seed dormancy breaking method. **[4]**

**Q3)** a) Discuss on preparation of site for nursery. **[6]**

b) Comment on agri-expert zones of floriculture in India. **[4]**

**Q4)** a) Write on special horticultural practices. **[6]**

b) Comment on Air-layering practices. **[4]**

**Q5)** Write short notes on Any Two of the following.

a) Methods of caring of seedlings. **[5]**

b) Production of scented roses. **[5]**

c) Pre-requisites for nursery. **[5]**

**ॐ ॐ ॐ**

**P.T.O.**

Total No. of Questions : 5]

**PA-3325**

**[5915]-24**

**M.Sc.**

**BOTANY**

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

*Time : 2 Hours]*

*[Max. Marks : 35*

*Instructions to the candidates:*

- 1) *Q. No. 1 is compulsory.*
- 2) *Solve any three questions from Q. No. 2 to Q. No. 5.*
- 3) *Question No. 2 to 5 carry equal marks.*

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

- a) Name any two edible mushrooms.
- b) Name any two recipes of mushrooms.
- c) The seed of mushroom is termed as?
- d) Name two biopesticides.
- e) Define parasitism.
- f) Name any one myconematicide.

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

b) Give an account of commerlization of biopesticides. **[4]**

**Q3)** a) Explain the role of crop rotation and organic amendments in bio control mechanism. **[6]**

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

**Q4)** a) Discuss the role of mycoherbicides and mycoweedicides as biocontrol agents. **[6]**

b) Give an account of present status of mushroom cultivation in India. **[4]**

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

- a) Biofertilizers
- b) Biopesticides
- c) Cultivation of wood mushroom (Lentinus)



Total No. of Questions : 7]

SEAT No. :

PA-3326

[Total No. of Pages : 2

[5915]-31

M.Sc. - II

BOTANY

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

*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) *Question 2 to 7 carry equal marks.*

**Q1)** Solve any Five of the following :

**[10]**

- a) Define standard deviation.
- b) What is Bioinformatics?
- c) What do you mean by mole and molarity.
- d) Calculate the median from following data  
9, 11, 12, 10, 11, 15, 11, 13, 12, 14
- e) The percentage of water, lipid, protein and other minerals are 66.35%, 6.66%, 5.2%, 21.79% respectively in body of species of fish. Draw a pie chart with the help of the given data.
- f) What is a sampling?

**Q2)** a) What is a scientific communication? Discuss the importance of scientific communication. **[7]**

b) Write note on BLAST. **[5]**

**P.T.O.**

**Q3) a)** Explain Mann-Whitney U test. [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 obtained. Find out the Chi-square value. [5]

Area :	1	2	3	4	5	6	7	8	9	10
lichen (m <sup>2</sup> ) :	25	32	17	23	15	39	27	19	22	26

**Q4) a)** Describe the process of patent submission. [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

Width(cm) : 7.10 12.42 15.35 23.20 28.45 32.25 39.84

**Q5) a)** Discuss legal forms of communication of science state four ethics in scientific communication. [7]

b) The weight of 10 pigs when brought in piggery and after six months are given below. Examine whether the gain in weight is statistically significant or not. [5]

Wt.when brought : 49 41 37 41 42 37 39 38 41 35

Wt. after six month : 52 43 46 52 46 38 42 40 42 38

**Q6) a)** Explain Tukey's test for pairwise comparison of treatment. [7]

b) In cross between Toll (TT) and dwarf (tt) 1574 toll and 554 dwarf plants were obtained. Suggest if 0 ratio 3:1 is applicable or not. [5]

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

a) Random and non-random sampling.

b) Spearman's rank.

c) Hypergeometric distribution.



Total No. of Questions : 7]

SEAT No. :

PA-3327

[Total No. of Pages : 2

[5915]-32

M.Sc.

BOTANY - II

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

*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) *Question 2 to 7 carry equal marks.*

**Q1)** Solve any Five of the following :

**[10]**

- a) Define commitment.
- b) Define differentiation.
- c) What is photomorphogenesis?
- d) What is potency?
- e) What is cell fate?
- f) Define Juvenility.

**Q2)** a) Discuss about Extrinsic factors affecting plant development.

**[7]**

b) Explain the process of redifferentiation with suitable example.

**[5]**

**Q3)** a) What is cell potency? Discuss various types of potencies.

**[7]**

b) Explain the organization of RAM with suitable diagram.

**[5]**

**P.T.O.**

- Q4)** a) Define stem cells. Describe their types. Add a note on role of stem cells in developmental Botany. [7]  
b) Write a note on microsporogenesis. [5]
- Q5)** a) Explain adventive embryogeny with neat labelled diagram. [7]  
b) What is Senescence? Describe any two patterns of Senescence. [5]
- Q6)** a) What is apomixis? Discuss non-recurrent apomixis with suitable diagram. [7]  
b) Describe male germ unit with suitable diagram. [5]
- Q7)** Write short notes on any two of the following: [12]  
a) Mutants in development.  
b) Significance of Double fertilization.  
c) Photoreceptors.



Total No. of Questions : 7]

SEAT No. :

PA-3328

[Total No. of Pages : 2

**[5915]-33**  
**M.Sc.**  
**BOTANY - II**  
**BOUT - 233 : Plant Physiology**  
**(2019 Pattern) (Semester - III) (CBCS)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Q.1 is compulsory.*
- 2) *Attempt any 5 questions from Q.2 to Q.7.*
- 3) *Question 2 to 7 carry equal marks.*

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

- a) What is active transport?
- b) Sketch and label structure of stomata.
- c) Define photorespiration.
- d) Which is primary electron acceptor in PS-I?
- e) Give any two functions of lipids.
- f) Give definition of glycolysis.

**Q2)** a) Describe in detail role of soil. **[7]**

b) Write a short note on photo-oxidation of water. **[5]**

**Q3)** a) Explain in detail mechanism of Cyanide resistance pathway. **[7]**

b) Comment on properties of water. **[5]**

**P.T.O.**

- Q4)** a) Explain events in glycolysis. Add a note on significance of respiration. [7]  
b) Write a short note on growth and its phases. [5]
- Q5)** a) Comment on CO<sub>2</sub> fixation in C<sub>4</sub> Cycle. Add a note on Kranz anatomy. [7]  
b) Comment on source - Sink relationship. [5]
- Q6)** a) Define seed dormancy. Add a note on methods of breaking seed dormancy. [7]  
b) Balance sheet of ATP generation in respiration. [5]
- Q7)** Write short note on any two of the following. [12]  
a) Significance of respiration.  
b) C<sub>4</sub> photosynthesis in single cell.  
c) Water conservation strategies of plants.



Total No. Of Questions : 5]

SEAT No. :

PA-3329

[Total No. Of Pages : 2

**[5915]-34**  
**M.Sc.(Botany)**  
**BODT-234 A: Mycology**  
**(CBCS) (2019 Pattern) (Semester-III)**

*Time : 2 Hours]*

*[Max. Marks : 35*

*Instructions to the candidates :*

- 1) *Q.1 is compulsory.*
- 2) *Solve 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) Define Mycology.
- b) Enlist classes of myxomycota.
- c) What is coenocytic hyphae?
- d) Define imperfect fungi.
- e) Write any two classes of Ascomycota.
- f) What are parasitic fungi?

**Q2) a) Describe general characters of Zygomycota.** **[6]**

b) Explain Significances of Fungi. **[4]**

**Q3) a) Draw an outline of webster & weber system (2007) of classification.** **[6]**

b) Describe general characters of Basidiomycetes. **[4]**

*P.T.O.*

**Q4) a)** Describe structural variations in Agaricales. [6]

b) Comment on fungal growth. [4]

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

a) Sexual spores in Basidiomycetes.

b) Heterothallism

c) Asexual reproduction Ascomycota.





Total No. Of Questions : 5]

SEAT No. :

PA-3330

[Total No. Of Pages : 2

**[5915]-35**  
**M.Sc.(Botany)**  
**BODT-234 B: Taxonomy Of Angiosperms**  
**(CBCS) (2019 Pattern) (Semester-III)**

*Time : 2 Hours]*

*[Max. Marks : 35*

*Instructions to the candidates :*

- 1) *Q.1 is compulsory.*
- 2) *Solve 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) Define Serology.
- b) Comment on SEM.
- c) Give any two morphological features used in identification.
- d) What are "Floras"?
- e) Write full form of IUCN.
- f) Give any two functions of BSI.

**Q2) a) Write Principles of ICN.** **[6]**

b) Discuss various botanical gardens of the world. **[4]**

**Q3) a) Explain anatomical characters of taxonomic importance with examples.** **[6]**

b) What are taxonomic keys? Discuss their types & give the importance. **[4]**

*P.T.O.*

**Q4) a)** Write in details about role & importance of RFLP and discuss steps involved in it. [6]

b) Comment on classes of compounds & their significance. [4]

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

a) Ultrastructural Systematics and its role.

b) Endemism and hotspots of India.

c) Biodiversity conservation



Total No. Of Questions : 5]

SEAT No. :

PA-3331

[Total No. Of Pages : 2

**[5915]-36**  
**M.Sc.(Botany)**  
**BODT-234 C: Plant Ecology**  
**(CBCS) (2019 Pattern) (Semester-III)**

*Time : 2 Hours]*

*[Max. Marks : 35*

*Instructions to the candidates :*

- 1) *Q.1 is compulsory.*
- 2) *Solve 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 Symbiosis?
- b) Explain Homeostasis.
- c) Define Synecology.
- d) Enlist any two characteristics of population.
- e) What is ecotone?
- f) Enlist types of ecosystem.

**Q2) a) Describe Ecological Pyramids** **[6]**

b) Explain Biogeochemical cycle of Nitrogen (N) **[4]**

**Q3) a) What is species interaction? Describe Interspecific competition.** **[6]**

b) Explain concept of limiting factors. **[4]**

*P.T.O.*

- Q4)** a) Describe structure/stratification of community. [6]  
b) Give a short note on food chain. [4]

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

- a) Write a short note on Herbivory  
b) Add a note on pollination.  
c) Give an account of terrestrial ecosystem.



Total No. Of Questions : 5]

SEAT No. :

PA-3332

[Total No. Of Pages : 2

**[5915]-37**  
**M.Sc.(Botany)**  
**BODT-234 D: Plant Biotechnology**  
**(CBCS) (2019 Pattern) (Semester-III)**

*Time : 2 Hours]*

*[Max. Marks : 35*

*Instructions to the candidates :*

- 1) *Q.1 is compulsory.*
- 2) *Solve 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) Define promotor.
- b) What is tissue culture.
- c) What is vector
- d) Define somatic Hybridization.
- e) Define Biosafety
- f) What is patent.

**Q2) a) Explain plant viruse based vector used in transgenic plants.** **[6]**

b) Give an account factors affecting somaclonal variation. **[4]**

**Q3) a) Explain the role of Biotechnology to control the air and water pollution.** **[6]**

b) Write application of transgenic plant in Biotic stress tolerance. **[4]**

*P.T.O.*

- Q4)** a) What is transgenic plant? Describe structure of Ti plasmid. [6]  
b) Give Biosafety guideline in India [4]

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

- a) Intellectual property rights.  
b) Cybrid  
c) Risk assessment in Research Laboratory.



Total No. Of Questions : 5]

SEAT No. :

PA-3333

[Total No. Of Pages : 2

**[5915]-38**  
**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) *Q.1 is compulsory.*
- 2) *Solve 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 Karyotype.
- b) What are IS elements?
- c) State Hardy-Weinderg principle.
- d) Write any two factors influencing MAS
- e) Define genetic diversity.
- f) Define DUS.

**Q2) a) Describe diallele cross analysis.** **[6]**

b) Write on Intellectual property Rights. **[4]**

**Q3) a) Explain QTL mapping.** **[6]**

b) Comment on Molecular evolution. **[4]**

*P.T.O.*

- Q4)** a) Discuss on Synder's ratio, their importance & effects over random mating. [6]
- b) Write applications of Karyotyping. [4]

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

- a) B - Chromosome & accessory chromosome.
- b) Effect of Salinity Stress on plants.
- c) Correlation - Coefficient analysis.





Total No. Of Questions : 5]

SEAT No. :

PA-3334

[Total No. Of Pages : 2

**[5915]-39**  
**M.Sc.(Botany)**  
**BODT-234 F: SEED SCIENCE**  
**(CBCS) (2019 Pattern) (Semester-III) (2 Credits)**

*Time : 2 Hours]*

*[Max. Marks : 35*

*Instructions to the candidates :*

- 1) *Q.1 is compulsory.*
- 2) *Solve 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 seed Technology?
- b) Define recalcitrant seeds.
- c) What is seed viability?
- d) What is a phenol colour test?
- e) What is the full form of ELISA?
- f) Define gametocides.

**Q2) a) What is a seed? Describe classes of seed in detail.** **[6]**

b) Comment on seed technology. **[4]**

**Q3) a) Define seed germination. Discuss types of germination.** **[6]**

b) Write chemical composition of seed in brief. **[4]**

*P.T.O.*

- Q4)** a) Discuss phenol colour test in detail. [6]
- b) What is germination testing? Write soil method in detail for testing seed germination. [4]

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

- a) Artificial seed production.
- b) Male sterility
- c) Types of seed samples.



Total No. of Questions : 7]

SEAT No. :

PA-3335

[Total No. of Pages : 2

**[5915]-41**  
**M.Sc. (Botany)**  
**BOUT - 241 : BOTANICAL TECHNIQUES (CBCS)**  
**(2019 Pattern) (Semester - IV)**

*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) *Question 2 to 7 carry equal marks.*

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

- a) What is dispersion of Light?
- b) Enumerate various adsorbants.
- c) What is ELISA.
- d) Give principle of electrophoresis.
- e) Give any two applications of spectroscopy.
- f) What is Autoradiography?

**Q2) a) Describe HPLC.** **[7]**

b) Give rules for safe handling of radio isotopes. **[5]**

**Q3) a) Discuss centrifugation technique.** **[7]**

b) Write on image formation in microscopy. **[5]**

**Q4) a) Explain SEM, with neat labelled ray-diagram.** **[7]**

b) Give significance of Radioactive techniques. **[5]**

**P.T.O.**

- Q5)** a) Comment on NCBI. [7]  
b) Write on Spectroflurometry. [5]
- Q6)** a) Give significance of histochemical techniques. [7]  
b) Write on Immunoprecipitation. [5]
- Q7)** Write short notes on any two of the following : [12]  
a) Give principle, working and applications of pH meter.  
b) Write note on UV-VIS Spectroscopy.  
c) SDS - PAGE.



Total No. of Questions : 7]

SEAT No. :

PA-3336

[Total No. of Pages : 2

[5915]-42

M.Sc. (Botany - II)

BOUT 242 : ADVANCED PLANT ECOLOGY

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

*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.*

**Q1)** Solve any Five of the following :

**[10]**

- a) Environmental audit.
- b) Mutualism.
- c) Herbivory.
- d) Biosensors.
- e) Air pollution.
- f) Define sustainability.

**Q2)** a) What are hotspots? Explain concept and basis of identification of hotspots and comment on hotspots in India. **[7]**

b) Give the uses of plants in mitigation of pollution. **[5]**

**Q3)** a) What is environmental ethics? Comment on views of Developed and developing countries. **[7]**

b) Biological diversity Act, 2002. **[5]**

**P.T.O.**

- Q4)** a) What are bioindicators? Enlist plants used as bioindicators in pollution control. [7]
- b) Discuss in details about environmental management plan. [5]
- Q5)** a) Define ecosystem. Describe desert ecosystem in details. [7]
- b) Write note on resistance and resilience. [5]
- Q6)** a) Describe in details the process for reviewing EIA of developmental projects. [7]
- b) Comment on ecology of Fresh water ecosystem. [5]
- Q7)** Write short notes on any Two of the following: [12]
- a) Levels of species diversity and its measurement.
- b) Endangered and threatened flora of India.
- c) Restoration of degraded water bodies.



Total No. of Questions : 5]

SEAT No. :

PA-3337

[Total No. of Pages : 2

**[5915]-43**  
**M.Sc. (BOTANY - II)**  
**BODT-243 Applied Mycology**  
**(CBCS)(2019 Pattern) (Semester - IV)**

*Time : 2 Hours]*

*[Max. Marks : 35*

*Instructions to the candidates :*

- 1) *Q. No.1 is compulsory.*
- 2) *Solve any Three questions from Q.2 to Q.5.*
- 3) *Que - 2 to Que - 5 carry equal marks.*

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

- a) What are smuts?
- b) Define seed pathology.
- c) Enlist types of mycorrhiza.
- d) Name any two enzymes produced by fungi.
- e) Enlist name of any two edible mushrooms.
- f) What is superficial mycosis?

**Q2) a) Explain rusts with suitable example.** **[6]**

b) Give economic importance of fungi in agriculture. **[4]**

**Q3) a) Describe cultivation of wheat straw mushroom pleurotus.** **[6]**

b) Explain role of fungi in alcohol fermentation. **[4]**

*P.T.O.*

**Q4) a)** Describe forest pathology & its significance. [6]

b) Explain role of fungi in human disease. [4]

**Q5) Write short notes on any Two of the following :** [10]

a) Myconematicides

b) Fungi as food

c) Food toxins.





Total No. of Questions : 5]

SEAT No. :

PA-3338

[Total No. of Pages : 2

[5915]-44

S.Y. M.Sc. (Botany)

**BODT-243B: ADVANCED MEDICINAL BOTANY**

**(CBCS) (2019 Pattern) (Semester - IV)**

*Time : 2 Hours]*

*[Max. Marks : 35*

*Instructions to the candidates :*

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

**Q1)** Solve any five of the following :

- a) Define Pharmacognosy. [1]
- b) Define crude drug. [1]
- c) Write botanical name of any two medicinal plants. [1]
- d) Give any two macroscopic characters of Aloe Vera. [1]
- e) Enlist any two applications of Digitalis. [1]
- f) Define pesticides [1]

**Q2)** Attempt the following :

- a) Describe the process of morphological and microscopic drug evaluation. [6]
- b) Write a note on marine drug. [4]

*P.T.O.*

**Q3)** Attempt the following :

a) Explain the cultivation method for Chlorophytum. [6]

b) Give importance of plants in cosmaceuticals. [4]

**Q4)** Attempt the following :

a) Elaborate the pharmacognostic importance of Aloe Vera. [6]

b) Give immunomodulatory significance of medicinal plants. [4]

**Q5)** Write short notes on any Two of the following :

a) Cultivation & Application of Catharanthus roseus. [5]

b) Phytopharmaceutical aspects of medicinal plants. [5]

c) Significance of natural excipients. [5]



Total No. of Questions : 5]

SEAT No. :

PA-3339

[Total No. of Pages : 2

[5915]-45

S.Y. M.Sc. (Botany)

**BODT-243C: ADVANCED PLANT PHYSIOLOGY**

**(CBCS) (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) *Question 2 to 5 carry equal marks.*

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

- a) Name the fruit ripening hormone.
- b) Give any two methods of storage of cut flowers.
- c) What is anoxia?
- d) What is CO<sub>2</sub> compensation point?
- e) Define photosystem? Give its types.
- f) What is respiration?

**Q2)** a) Explain in detail role of respiration in carbon balance. **[6]**

b) Write a note on biotic stress. **[4]**

**Q3)** a) Describe in detail regulation of C<sub>3</sub> photosynthesis. **[6]**

b) Comment on Drought stress. **[4]**

*P.T.O.*

**Q4)** a) Give an account of C<sub>3</sub>-C<sub>4</sub> intermediate pathway. [6]

b) Write a short note on response of plant in flood condition. [4]

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

a) CO<sub>2</sub> response curve.

b) CAM in desert plants.

c) Chemical changes during fruit ripening.



Total No. of Questions : 5]

SEAT No. :

PA-3340

[Total No. of Pages : 2

**[5915]-46**  
**M.Sc. (Part - II)**  
**BOTANY**  
**BODT-243 : D) Industrial Biotechnology**  
**(2019 Pattern) (Semester - IV) (CBCS)**

*Time : 2 Hours]*

*[Max. Marks : 35*

*Instructions to the candidates:*

- 1) *Q.1 is compulsory.*
- 2) *Attempt any three questions from Q.No. 2 to Q.No. 5.*
- 3) *Q.No. 2 to Q.No. 5 carry equal marks.*

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

- a) Define Bioplastic.
- b) Give two examples of fermented dairy product.
- c) What is bioleaching?
- d) Write names of two amino acids produced by fermentation process.
- e) What is Biofiltration?
- f) Write any two fermented feed products.

**Q2)** a) Give brief outline process for citric acid production. **[6]**

b) Give objective of Bioremediation. **[4]**

**Q3)** a) Describe the role of microbes in Bioremediation. **[6]**

b) Explain process of  $\beta$ -carotene production. **[4]**

**Q4)** a) Give brief outline process of ethanol production. **[6]**

b) Comment on food additives. **[4]**

*P.T.O.*

**Q5)** Write notes on any two :

**[10]**

- a) Primary metabolites
- b) Nanocatalysis
- c) Toxins



Total No. of Questions : 5]

SEAT No. :

PA-3341

[Total No. of Pages : 2

[5915]-47

S.Y. M.Sc.

BOTANY

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

*Time : 2 Hours]*

*[Max. Marks : 35*

*Instructions to the candidates:*

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

**Q1)** Solve any five of the following :

**[5]**

- a) Define seed technology.
- b) Define seed entomology.
- c) What is seed deterioration?
- d) Who appoint the qualified person as a seed inspector?
- e) What is seed quarantine?
- f) Define seed storage.

**Q2)** a) Describe about pre cleaner and colour separator machines.

**[6]**

b) Explain seed health methods.

**[4]**

**Q3)** a) Explain about integrated management of seed borne diseases.

**[6]**

b) Explain central seed committee and their functions.

**[4]**

**P.T.O.**

- Q4)** a) Give the detailed account of seed inspector, its power and duties. [6]  
b) Explain the relation between the insect and plant. [4]

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

- a) Causes of seed deterioration
- b) Indian seed legislation
- c) Handling of seeds; conveyer and Elevators





Total No. of Questions : 5]

SEAT No. :

PA-3342

[Total No. of Pages : 2

[5915]-48

M.Sc.

BOTANY (Part - II)

BODT-244 : Plant Tissue Culture 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.*

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

- a) What is Biotransformation?
- b) Define re-differentiation.
- c) Enlist any two environmental factors affecting plant tissue culture.
- d) What is electroporation?
- e) Enlist the growth regulators used in plant tissue culture.
- f) Define totipotency of the plant cell.

**Q2)** a) Define micropropagation. Describe various factors affecting micropropagation. **[6]**

b) Explain somatic hybridization. Enlist its application. **[4]**

**Q3)** a) Comment on-Immobilization of cells. **[6]**

b) Describe the process of biolistic transfer. **[4]**

*P.T.O.*

- Q4)** a) What is germplasm? Write note on Ex-situ conservation of germplasm. [6]
- b) Describe the mechanism of integration of DNA into plant genomes. [4]

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

- a) Somaclonal variation.
- b) Agrobacterium mediated gene transfer to plants.
- c) Protoplast Culture.



Total No. of Questions : 5]

SEAT No. :

PA-3343

[Total No. of Pages : 2

[5915]-49

M.Sc. - II

BOTANY

**BODT 244 : 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) *Question 2 to 5 carry equal marks.*

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

- a) Define Herbal Technology.
- b) What is Probiotics?
- c) Give Longform of WHO.
- d) Define Bioprospecting.
- e) Write in short on churna.
- f) Enlist any 2 names of herbal raw material.

**Q2)** a) Give an detailed account of herbal plants used in skin care. **[6]**

- b) Write a brief classification of herbal products based on product usage. **[4]**

**Q3)** a) Give detailed guidelines of WHO and ICH for the assessment of Herbal products. **[6]**

- b) Write on processing of herbal raw material. **[4]**

**P.T.O.**

- Q4)** a) What is Patent? Give patenting aspects of traditional knowledge. [6]  
b) Give an account of medicinal plants as a source of tannins and phenolics. [4]

- Q5)** Write short notes on any Two of the following : [10]  
a) Write on stability testing of herbal drugs.  
b) Give concept and need of packaging of herbal products.  
c) Write a short note on Herbal cosmetics.



Total No. of Questions : 5]

SEAT No. :

PA-3344

[Total No. of Pages : 2

**[5915]-50**  
**M.Sc.**  
**BOTANY - II**  
**BODT 244 C : Research Methodology**  
**(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) *Question 2 to 5 carry equal marks.*

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

- a) What is plagiarism.
- b) Enlist different types of research method.
- c) What is fundamental research.
- d) Define Histogram.
- e) What is meant by citations.
- f) Enlist the name of model organisms used in the research of genetics.

**Q2)** a) Discuss ethical aspects in preparing scientific reports. **[6]**

b) What is the importance of plagiarism in scientific writing. **[4]**

**Q3)** a) Explain various kinds of graphs with their importance in data analysis. **[6]**

b) What are the rules of poster making. **[4]**

**P.T.O.**

**Q4)** a) Discuss characteristic features of model organisms used in life sciences. **[6]**

b) What are the ethics of copy right. **[4]**

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

a) Concept and sources of literature review.

b) Importance of fundamental research.

c) Importance of reproducibility in scientific research.

