Total No. of Questions : 7]

SEAT No. :

P443

[Total No. of Pages : 2

[5836]-101
M.Sc.-I
BOTANY
BOUT111 : Plant Systematics - I (Paper-I)
(2019 Pattern) (Semester-I) (Theory)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Questions 1 is compulsary.***
2) ***Solve any five questions from Q2. to Q.7.***
3) ***Questions 2 to 7 carry equal marks.***

Q1) Solve any five of the following.

a) Give two therapeutical properties of Bryophytes. **[2]**

b) Write two distinguishing characters of Oomycetes. **[2]**

c) Give any two applications of algae. **[2]**

d) Comment on types of conidia in Deuteromycotina. **[2]**

e) Give two applications of fungi as food. **[2]**

f) Define systematics and taxonomy. **[2]**

Q2) a) Describe thallus structure and fructification of Ascomycotina. **[7]**

b) Give distinguishing characters of cyanophyta and significance of heterocyst. **[5]**

Q3) a) Give distinguishing characters and life cycle patterns in myxomycotina. **[7]**

b) Describe morphology and life cycle pattern in phaeophyta. **[5]**

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

b) Give affinities of Bryophytes with Pteridophytes. **[5]**

P.T.O.

Q5) a) Explain morphology and anatomy of Marchantiales. **[7]**

b) Discuss contribution of Fungal studies in India. **[5]**

Q6) a) Give distinguishing characters and anatomy of gametophyte of Eubryales. **[7]**

b) Give distinguishing characters and sexual reproduction in zygomycotina. **[5]**

Q7) Write short note on any two of the following.

a) Various algae habitats. **[6]**

b) Distinguishing characters and thallus structure of Basidiomycotina. **[6]**

c) Thallus organization in chlorophyta. **[6]**

Total No. of Questions : 07]

SEAT No. : ____

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[Total No. of Pages : 2

[5836]-102
M.Sc.-I
BOTANY
BOUT-112 : CELL BIOLOGY AND EVOLUTION
(2019 Pattern) (Semester-I) (CBCS)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Questions 1 is compulsory.***
2) ***Attempt any five questions from Q2. to Q.7.***
3) ***Questions 2 to Q.7 carry equal marks.***

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

a) What are three families of macromolecules?

b) Enlist the Four main types of organic molecules of a cell.

c) Mention difference between nucleotides and Nucleosides.

d) What are phragmoplasts?

e) What is cadherins?

f) What is calmodulin pathway?

Q2) a) Describe Hardy - Weinberg Law. **[7]**

b) Describe the use of flow cytometry in the study of cell - cycle. **[5]**

Q3) a) Explain the concept of intracellular vesicular trafficking. **[7]**

b) Justify the concept of evolutionary synthesis. **[5]**

Q4) a) Explain the Process of regulation of cell - death. **[7]**

b) Describe Geological time scale. **[5]**

P.T.O.

Q5) a) Describe ultrastructure and functions of Eukaryotic ribosomes. **[7]**

b) Discuss the concept of phosphoripid signaling in plants. **[5]**

Q6) a) Explain the sympathetic signaling cascades of G-protein coupled receptors (GPCR). **[7]**

b) Elaborate Principle and working of Miller experiment. **[5]**

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

a) Darwinism

b) Polytene chromosomes

c) cell surface receptars

Total No. of Questions : 7]

SEAT No. : ____

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[Total No. of Pages : 2

[5836]-103
M.Sc. - I
BOTANY
BOUT-113 : Cytogenetics and Plant Breeding and Evolution (Paper-III)
(2019 Pattern Credit System) (Semester-I)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Attempt any five questions from Q2. to Q.7.***
3) ***Questions 2 to Q.7 carry equal marks.***

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

a) What is epistasis?

b) Give concept of Neo-Darwinism.

c) Enlist applications of plant breeding.

d) Define deletion and duplication.

e) Give importance of yeast as a model system.

f) What are cytoplasmic inheritance?

Q2) a) What are sex linkage? Describe sex limited and sex influenced charactors. **[7]**

b) Explain cytological and genetical method of allopolyploids identification. **[5]**

Q3) a) Explain mechanism of generalized transduction. **[7]**

b) Describe concept of parthenocarpy with its applications. **[5]**

P.T.O.

Q4) a) Explain inheritance of quantitative characters with suitable example. **[7]**

b) Describe multicellular evolution with major groups of plant. **[5]**

Q5) a) Describe origin and evolution of unicellular eukaryotes. **[7]**

b) Explain selection method in asereually propogated crops. **[5]**

Q6) a) Explain the concept of insertional and point mutagenesis. **[7]**

b) Describe the types of structural alternations of chromosomes. **[5]**

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

a) Importance of landraces in crop improvement.

b) Gene duplication and its importance.

c) BA translocations.

Total No. of Questions :5]

SEAT No. : ____

P446

[Total No. of Pages :4

[5836] - 104

M.Sc. - I

BOTANY

BODT-114 : Biofertilizers & Algal Technology

(2019 Pattern) (Semester - I)

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) ***Questions No.2 to 5 carry equal marks.***

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

a) What is geneticaly engineered microorganism.

b) What is PSB?

c) Define SCP.

d) Define biofertilizers.

e) What is biohydrogen?

f) Define algal technology.

Q2) a) Give the potential of algal as Fine chemical & Fuel. **[6]**

b) Comment on need & significance of biofertilizer. **[4]**

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

b) Write applications of seaweed biofertilizers. **[4]**

P.T.O.

Q4) a) Explain the process of Spirulina mass cultivation. **[6]**

b) Comment on cyanobacteria as biofertilizer. **[4]**

Q5) Write on Any Two of following. **[10]**

a) Write on Rhizobium as a biofestilizers **[5]**

b) Explain the process of cultivation of algal & extraction of biodiesel. **[5]**

c) Comments on large scale biomass Production of various strains. **[5]**

Total No. of Questions :5]

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[5836] - 104

M.Sc. -I

BOTANY

BODT - 114 : Pomoculture and Fruit Processing Technology

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

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) ***Questions No.2 to 5 carry equal marks.***

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

a) Give advantages of rectangular system.

b) Write any two importance of fruit crops.

c) What is pomace?

d) What is packaging?

e) Mention any two principles of preservation.

f) What is seed lessness?

Q2) a) Comment on maturity indices. **[6]**

b) Describe scope of Fruit growing in Maharashtra. **[4]**

Q3) a) Write in brief about sexual methods of Propagation of fruit trees. **[6]**

b) Explain cold storage of fruits. **[4]**

Q4) a) Comment on the process of sauce and ketch - up. **[6]**

b) Explain the role of growth harmones on growth and fruiting. **[4]**

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

a) Methods of Prunning.

b) Scope of fruit crops.

c) Methods of Preservation of fruits.

Total No. of Questions : 7]

SEAT No. : ____

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[Total No. of Pages : 2

[5836]-201
M.Sc. - I
BOTANY
BOUT -121 : Plant systematics-II
(2019 (CBCS) 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 Q2. to Q.7.***
3) ***Questions 2 to Q.7 carry equal marks.***

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

a) What is apogamy?

b) Write economic importance of gymnosperms.

c) Give any two biotechnological applications of pteridophytes.

d) Write any two salient features of angiosperms.

e) What is convergence?

f) Write any two affinities of gymnosperms with angiosperms.

Q2) a) Describe the affinities of Gnetales. **[7]**

b) Give general characters of family Nymphaeaceae. **[5]**

Q3) a) Describe the morphology and anatomy of sporophyte of selaginellales. **[7]**

b) Give classification of gymnosperms as per sporne system. **[5]**

Q4) a) Write the general characters of coniferales. **[7]**

b) Explain the anatomy of gametophyte of Marsileales. **[5]**

P.T.O.

Q5) a) Describe the morphology and economic importance of family Leguminaceae. **[7]**

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

Q6) a) Write comparative account of morphology and anatomy of cycadales and Ginkgoales. **[7]**

b) Describe the morphology of family Amaranthaceae. **[5]**

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

a) Pre Darwinian system of classification.

b) Origin and erolution of angiosperms.

c) APG IV System of classification.

Total No. of Questions : 7]

SEAT No. : ____

P448

[Total No. of Pages : 2

[5836]-202
M.Sc.
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 Q2. to Q.7.***
3) ***Questions 2 to 7 carry equal marks.***

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

a) What is ELISA?

b) Define C-value.

c) What is mean by DNA damage?

d) Explain copping.

e) Define genome.

f) What is positive gene regulations?

Q2) a) Describe the steps involved in PCR? **[7]**

b) Write a note on properties of DNA. **[5]**

Q3) a) Explain the enzymes and Factors involved in transcription. **[7]**

b) Write a note on genomics? **[5]**

Q4) a) Discuss the role of DNA modifying enzymes? **[7]**

b) Explain the general factors of DNA Replication. **[5]**

Q5) a) What is gene regulation? Explain gene regulation. **[7]**

b) Describe the process of protein Folding. **[5]**

P.T.O.

Q6) a) Describe mechanism of DNA Replication. **[7]**

b) Comment on southern blotting technique. **[5]**

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

a) DNA repair mechanism.

b) Objectives of Proteomics.

c) Importance of transposons.

Total No. of Questions : 07]

SEAT No. :

P449

[Total No. of Pages : 2

[5836]-203
M.Sc. - I
BOTANY
BIOCHEMISTRY
(2019 Pattern) (Semester-II) (CBCS) (BOUT123)

Time : 3 Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Attempt any five questions from Q2. to Q.7.***
3) ***Questions 2 to Q.7 carry equal marks.***

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

a) What is metabolomics?

b) Enlist properties of lipids.

c) What are NOD factors?

d) Enlist factors affecting enzyme activity.

e) What are glycosides? Give any two properties.

f) What are weak acids and weak bases?

Q2) a) Explain qualitative and quantitative analysis method for phenols. **[7]**

b) Write an account on nitrogen uptake in plants. **[5]**

Q3) a) Describe the reactions of β-oxidation of lipids. **[7]**

b) Give general classification of enzymes and factors affecting enzyme. activity. **[5]**

Q4) a) Give Structure and properties of carbohydrates. **[7]**

b) Explain Michaelis - mention equation with example. **[5]**

Q5) a) Explain the mechanism of breakdown of glucose. **[7]**

b) Descirbe biosynthesis of purines and pyrimidines. **[5]**

P.T.O.

Q6) a) What are secondary metabolites? Describe biosynthetic pathway of terpenes. **[7]**

b) Write an account on integration of metabolism. **[5]**

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

a) Structure of DNA.

b) Classification of carbohydrates.

c) Laws of thermodynamics.

Total No. of Questions :5]

SEAT No. : ____

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[Total No. of Pages :4

[5836] - 204

M.Sc. I

BOTANY-I

BODT-124 A : Floriculture and Nursery Management

(2019 CBCS Pattern) (Semester - II)

Time : 2 Hours] ***[Max. Marks :35***

Instructions to the candidates:

1) ***Q. No. 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 varities of Anthurium.

b) What is Mulching?

c) Define tending of seedlings.

d) What is pruning?

e) Define vase life of Flower.

f) Enlist the material used in growing media.

Q2) a) Discuss the cultivation practices for Jasmine. **[6]**

b) Write on Methods of Seed germination. **[4]**

Q3) a) Discuss design & layout of Nursery. **[6]**

b) Comment of physiological disorders of flowers. **[4]**

Q4) a) Write on commercial cultivation of Tuberose. **[6]**

b) Discuss the budding technique. **[4]**

P.T.O.

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

a) Growing media. **[5]**

b) Postharvest handling & grading of Flowers. **[5]**

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

Total No. of Questions :5]

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[5836] - 204

M.Sc.

BOTANY-I

BODT - 124 B : Mushroom Cultivation and Biopesticide Technology

(2019 CBCS Pattern) (Semester - II)

Time : 2 Hours] ***[Max. Marks :35***

Instructions to the candidates:

1) ***Q. No. 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) Define mycopesticide.

b) Define Amensalism.

c) Name any two biocontrol agents.

d) Mention the substrate used for Lentinus Cultivation.

e) Give the botanical name of button mushroom.

f) Mention two nutritional component of a mushroom.

Q2) a) Explain the present status of mushroom cultivation in India & abroad. **[6]**

b) Give an account of Bacterial and viral Pesticides as control agents. **[4]**

Q3) a) Explain any two methods of biological control in the field. Add a note on Antagonism. **[6]**

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

Q4) a) Explain in details about any two Biological pesticides. **[6]**

b) Give an account of Pest management in mushroom cultivation. **[4]**

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

a) Mushroom recipes.

b) Concept of biological control.

c) Predation & Parasitism.

Total No. of Questions : 07]

SEAT No. : ____

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[Total No. of Pages : 2

[5836]-301
M.Sc.-II
BOTANY
Computational botany
(2019 Pattern) (Semester-III) (CBCS) (BOUT 231)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Attempt any five questions from Q2. to Q.7.***
3) ***Questions 2 to7 carry equal marks.***

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

a) Define median and mode.

b) What is vector and vector arthmatics.

c) What do you mean by database.

d) What is a scatter diagram.

e) Calculate Karl Pearson coefficient of correlation between values of x and y.

x	15	16	17	18	19	20
y	80	75	60	40	30	20

f) How many gram of solid NaOH are required to prepare 500 ml of 0.04 M sol^{n}.

Q2) a) Describe indetailed steps involved in Research paper writing. **[7]**

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

Q3) a) Explain Tukey's test for pairwise comparison of treatment. **[7]**

b) In cross between tall (TT) and dwarf (tt) 1574 tall and 554 dwarf plants were obtained suggest if a ratio 3:1 is applicable or Not. **[5]**

P.T.O.

Q4) a) Discuss legal forms of communication of science, state four ethics in scientific communication. **[7]**

b) The Weight 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

Q5) a) Explain in Duncan's multiple range test. **[7]**

b) The theory predict that proportions of beans in a four groups A,B,C,D Should be 9:3:3:1 in experiment with 1600 beans in 4 groups were 882, 313, 287, 118 respectively. Does the experiment result support theory? **[5]**

Q6) a) Discuss on IPR. **[7]**

b) Calculate the standard error of mean of the yield (kg) of honey from ten hives as given below. **[5]**

1. 2. , 1.6, 1.4, 2.0, 2.2, 2.9, 2.0, 2.2, 2.1, 2.4.

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

a) Non - Parametric test.

b) Kurtosis.

c) SPSS.

Total No. of Questions : 7]

SEAT No. : ____

P452

[Total No. of Pages : 2

[5836]-302
M.Sc.-II
BOTANY
Bout-232 : Developmental Botany
(2019 CBCS Pattern) (Semester-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.***

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

a) Define poteney

b) What is commitment?

c) What is skotomorphogenesis?

d) Comment on stem cells

e) Define juvenility

f) What is dedifferentiation?

Q2) a) Discuss the difference between plant and animal Development. **[7]**

b) Explain the process of commitment. **[5]**

Q3) a) Define polarity Discuss its types in details with suitable examples. **[7]**

b) Explain about cell lineage. **[5]**

Q4) a) What is competence? add a note on Proximate induction and describe its components. **[7]**

b) Discuss the role of cytoplasmic determinants. **[5]**

Q5) a) Discuss the development of stamen with suitable diagram. **[7]**

b) Write a note on male germ unit. **[5]**

P.T.O.

Q6) a) What is Endosperm? Explain free nuclear Endosperm. **[7]**

b) What is polyembryony? Write its classification. **[5]**

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

a) Epigenetics.

b) Imprinting.

c) Enlist genes involved in inflorescence development.

Total No. of Questions : 07]

SEAT No. : ____

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[Total No. of Pages : 2

[5836]-303
M.Sc. - II
BOTANY
BOUT-233:PLANT PHYSIOLOGY
(2019 Pattern) (Semester-III) (CBCS)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Attempt any five questions from Q2. to Q.7.***
3) ***Questions 2 to 7 carry equal marks.***

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

a) Give any two properties of water.

b) Define passive transport.

c) What is kranz anatomy?

d) What is photo respiration?

e) Give any two uses of respiration.

f) Write any two properties of lipids.

Q2) a) Explain in detail sulfur assimilation. **[7]**

b) Write a short note on C_4 cycle. **[5]**

Q3) a) Explain detail difference in PS-I and PS-II. **[7]**

b) Write a short note on Glycolysis. **[5]**

Q4) a) What is biatic stress? Write factors affecting biotic stress. **[7]**

b) Write a short note on soll formation. **[5]**

Q5) a) Explain in detail mechanism of opening & closing of stomata. **[7]**

b) Write a short note on Source - sink relationship. **[5]**

P.T.O.

Q6) a) Explain in detail PPP pathway. Add a note on balance sheet of ATP in respiration. **[7]**

b) Comment on factors affecting transport of water. **[5]**

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

a) Seed dormancy.

b) Significance of lipids.

c) Water scarcity.

Total No. of Questions : 5]

SEAT No. : ____

P454

[Total No. of Pages : 1

[5836]-304
M.Sc. - II
BOTANY
BODT 234 A: Mycology
(2019 Pattern) (Semester-III) (CBCS)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Attempt any three questions from Q2. to Q.5.***
3) ***Questions 2 to 5 carry equal marks.***

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

a) Write any two classes belonging to zygomycota
b) Why fungi are heterotrophs?
c) What is plasmodium?
d) What is basidium?
e) Define apothcium
f) What is meant by plasmodial fungi?

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

b) Write structural characters of polypores. **[4]**

Q3) a) Give an outline of classification of funig upto order level proposed by Alexopolus & mims (1979). **[6]**

b) Discuss hypomycetes fungi. **[4]**

Q4) a) Explain affinities of fungi with plants. **[6]**

b) Discuss sporangia to conidial evolution in mucorales. **[4]**

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

a) Budding & fission in zygomycetes
b) Pyrenomycetes
c) Chytrids

Total No. of Questions : 5]

SEAT No. :

P455

[Total No. of Pages : 1

[5836]-305
M.Sc.-II
BOTANY
BODT 234 B : Taxonomy of Angiosperms
(2019 Pattern) (Semester-III) (CBCS)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Questions 1 is compulsary.***
2) ***Attempt any three questions from Q2. to Q.5.***
3) ***Questions 2 to Q.5 carry equal marks.***

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

a) Define taxonomy.
b) What is precipitation reaction?
c) Give full form of RFLP.
d) Comment on functions of BSI.
e) What are hotspots.
f) Give any two morphological features used in identification.

Q2) a) Define Botanical nomenclature? Give principles of ICN. **[6]**

b) Write note on the role of herbanium and botanical gardens in teaching and research. **[4]**

Q3) a) Discuss embryology in relation to taxonomy giving any two examples. **[6]**

b) What are taxonomic keys. Give its types. **[4]**

Q4) a) What is RAPD? Give its applications in molecular systematics. **[6]**

b) Comment on various classes of compounds and their biological significance. **[4]**

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

a) Applications of SEM in plant systematics.
b) Biodiversity and its conservation methods.
c) ICUN and its categories.

Total No. of Questions : 5]

SEAT No. : ____

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[Total No. of Pages : 2

[5836] - 306

M.Sc (Botany)

BODT 234: C) PLANT ECOLOGY

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

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) ***Q.2 to Q.5 carry equal marks.***

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

a) Define Autecology.

b) What is population Ecology?

c) Define Herbivory.

d) What is food web?

e) Enlist vegetation zones of Maharashtra.

f) Give concept of climax.

Q2) a) Describe population growth curves. **[6]**

b) Explain Biogeochemical cycle of carbon [C]. **[4]**

Q3) a) What is Ecological succession? Enlist types and give mechanism of succession. **[6]**

b) Define Ecology. Give concept and scope of ecology. **[4]**

P.T.O.

Q4) a) Explain concept of Metapopulation. **[6]**

b) Give major drivers of biodiversity change. **[4]**

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

a) Give a note on Ecological Pyramids.

b) Explain Edges and Ecotones.

c) Add a note on life history strategies (R and K selection).

◆ ◆ ◆

Total No. of Questions : 5]

SEAT No. :

P468

[Total No. of Pages : 2

[5836] - 409

M.Sc (Botany)

BODT 244 : BHERBAL TECHNOLOGY

(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.2 to Q.5.***
3) ***Q.2 to Q.5 carry equal marks.***

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

a) Enlist any two medicinal plants used as a source of alkaloids.

b) Define IPR.

c) Write in short on Bhasma.

d) Enlist any two names of medicinal mushrooms.

e) What is mean by antioxidants?

f) Give any two names of herbal products in cosmetics.

Q2) a) Write a note on herbs as a source of probiotics and prebiotics. **[6]**

b) Write in brief on Aristas. **[4]**

Q3) a) Give in detailed description on herbal plants used in dyes and aromaticoils. **[6]**

b) Write in brief guidelines of charak samhita for assessment of herbal products. **[4]**

P.T.O.

Q4) a) What is farmers right? Give in detail case study of Curcuma. **[6]**

b) Define Herbal technology. Give in detailed concept and prospectors it. **[4]**

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

a) Give scope and future prospecting of herbal drug Industry.

b) Write a short note on preparation of Asawas.

c) Add a note on processing of herbal raw material.

◆◆◆

Total No. of Questions : 5]

SEAT No. :

P458

[Total No. of Pages : 2

[5836] - 308

M.Sc

BOTANY

BODT - 234E : Genetics and Plant Breeding

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

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) ***Q.2 to Q.5 carry equal marks.***

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

a) What is G - Banding?

b) What is Tn3 family?

c) Write any two quantitative effects of in breeding.

d) Enlist enzyme based markers.

e) What is metrograph analysis?

f) Define novelty.

Q2) a) Describe D^2 statistics. **[6]**

b) Comment on the protection of plant varieties. **[4]**

Q3) a) Explain Marker Assisted selection. **[6]**

b) Comment on genetics of salinity resistance. **[4]**

P.T.O.

Q4) a) Discuss on molecular analysis through in - situ hybridization of chromosome. **[6]**

b) Write on quantitative effects of inbreeding. **[4]**

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

a) Combined C & N banding.

b) DNA - sequence based markers.

c) Transposable elements in Maize.

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Total No. of Questions : 5]

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[5836] - 309

M.Sc (BOTANY)

BODT - 234F : Seed Science

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

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) ***Q.2 to Q.5 carry equal marks.***

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

a) What is seed technology?

b) Define orthodox seed.

c) What is seed germination?

d) What is a peroxidase test?

e) What is a full form of RFLP?

f) Define self incompatibility.

Q2) a) Describe the difference between seed and grain. **[6]**

b) Write importance of seed technology. **[4]**

Q3) a) Explain seed ageing and seed viability in detail. **[6]**

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

P.T.O.

Q4) a) Discuss peroxidase test in detail. **[6]**

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

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

a) Artificial pollination

b) Gametocides

c) Seed sampling

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Total No. of Questions : 7]

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P460

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[5836] - 401
M.Sc (Semester - IV)
BOTANY - II
BOUT - 241 : Botanical Techniques
(2019 Pattern) (CBCS)

Time : 3Hours] ***[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) What is Magnification?

b) Who discovered chromatography.

c) Give applications of digital herbarium.

d) What is isoelectric focusing?

e) What is atomic extinction?

f) Name the fluorochromes used in biology.

Q2) a) Describe Agarose gel electrophoresis. **[7]**

b) Explain Beer's - Lamberts law. **[5]**

Q3) a) Write role of various fluorochromes. **[7]**

b) Give role of chemicals used in plant material preservation for microtomy. **[5]**

Q4) a) Explain TEM, Draw neat labelled ray diagram. **[7]**

b) Comment on Autoradiography. **[5]**

P.T.O.

Q5) a) Comment on NMR Spectroscopy. **[7]**

b) Write on EMBEL. **[5]**

Q6) a) Comment on microtomy. **[7]**

b) Discuss data retrieval of protein with suitable example. **[5]**

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

a) Give principle, working and applications of conductivity meter.

b) Give principle and working of HPLC, draw neat labelled diagram.

c) Describe density gradient centrifugation.

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Total No. of Questions : 7]

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[5836] - 402
M.Sc - II
BOTANY
BOUT 242: Advanced Plant Ecology
(2019 Pattern) (Semester - IV) (CBCS)

Time : 3Hours] ***[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) Mutualism.

b) Allelopathy.

c) Bioindicators.

d) What is Environmental Impact Statement?

e) Environmental Audit.

f) What is concept of carrying capacity?

Q2) a) Define Biodiversity. Give importance of biodiversity and comment on threats to biodiversity. **[7]**

b) Describe methods of estimating population density of plants. **[5]**

Q3) a) Discuss in details plant relations and distribution with respect to precipitation. **[7]**

b) Write a note on wild life protection Act, 1972 **[5]**

Q4) a) What is EIA? Give objectives of EIA and explain its process. **[7]**

b) Write note on Biomass carbon sequestration. **[5]**

P.T.O.

Q5) a) What are biomes? Give characteristics of different biomes. **[7]**

b) Discuss in details forest types of India. **[5]**

Q6) a) Define phytoremediation ? Describe types of remediation methods. **[7]**

b) Explain adaptations in plants in various biomes. **[5]**

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

a) Indices of α – diversity.

b) Biopiracy *f* Bioprospecting.

c) Plants in conservation of soil.

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Total No. of Questions : 5]

SEAT No. :

P462

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[5836] - 403

S.Y. M.Sc

BOTANY

243 : APPLIED MYCOLOGY

(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.2 to Q.5.***
3) ***Q.2 to Q.5 carry equal marks.***

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

a) What is powdery mildew?

b) Define Mycorrhiza.

c) Who is the father of seed pathology?

d) Define Industrial Mycology.

e) Enlist any two value added mushroom products.

f) Define medical Mycology.

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

b) Describe ecological role of fungi. **[4]**

Q3) a) Give an account of methods of substrate preparation of pleurofus mushroom cultivation in brief. **[6]**

b) Describe role of fungi in enzyme production. **[4]**

P.T.O.

Q4) a) Describe role of fungi in fermentation industries. **[6]**

b) Explain Mycorrhiza as biofertilizers. **[4]**

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

a) Mycoinsecticides

b) Fungal food spoilage.

c) Role of fungi in cheese making.

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Total No. of Questions : 5]

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S.Y. M.Sc (Semester - IV)

BOTANY - II

BODT- 243: ADVANCED MEDICINAL BOTANY

(2019 Pattern)(CBCS)

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) ***Q.2 to Q.5 carry equal marks.***

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

a) Explain any two scopes of pharmacognosy. **[1]**

b) Define crude drug. **[1]**

c) Write botanical name of any two aromatic plants. **[1]**

d) Write any two macroscopic characters of Dioscorea. **[1]**

e) Enlist any two applications of shatavari. **[1]**

f) Give any two properties of natural pesticides. **[1]**

Q2) **Attempt the following:**

a) Describe the chemical & physical drug evaluation process. **[6]**

b) Give short note on natural pesticide. **[4]**

Q3) **Attempt the following:**

a) Explain the cultivation method for Terminalia arjuna **[6]**

b) Give significance of natural excipients. **[4]**

P.T.O.

Q4) **Attempt the following:**

a) Elaborate the pharmacognostic importance of Bramhi. **[6]**

b) Explain the immunomodulatory effect of medicinal plants. **[4]**

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

a) Applications of Turmeric and ginger.

b) Marine drugs.

c) Cosmaceruticals.

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Total No. of Questions : 5]

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M.Sc (Botany)

BODT 243: ADVANCED PLANT PHYSIOLOGY

(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.2 to Q.5.***
3) ***Q.2 to Q.5 carry equal marks.***

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

a) Give any two methods of storage of vegetables.

b) Chlorophyll are converted to which pigment, during fruit ripening?

c) Define stress.

d) What is chlorophyll fluorescence?

e) Enlist types of respiration.

f) Name any two examples of CAM plants.

Q2) a) Give detailed account of cyanide resistant respiration. **[6]**

b) Explain in brief water stress. **[4]**

Q3) a) Give an account of Evolution of RUBISCO. **[6]**

b) Comment on response of plant against salt stress. **[4]**

P.T.O.

Q4) a) Explain various methods of storage of flowers. **[6]**

b) Comment on Light saturation curve. **[4]**

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

a) Significance of aerobic respiration.

b) CAM in aquatic plants.

c) Fruit ripening.

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Total No. of Questions : 5]

SEAT No. :

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[5836] - 406

M.Sc. BOTANY - II

BODT 243D : 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.2 to Q.5.***
3) ***Q.2 to Q.5 carry equal marks.***

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

a) Define environmental Biotechnology?

b) Enlist types of industrial waste.

c) Write any two importance of Biotechnology.

d) What is SCP.

e) Write any two economic significance of Riboflavin.

f) Define nanofertilizers.

Q2) a) Describe scope & importance of Biotechnology. **[6]**

b) Comment on Hydrocarbons. **[4]**

Q3) a) Define nanomaterial ? Give its applications. **[6]**

b) Explain the significance of Biotechnology in fermentation technology. **[4]**

P.T.O.

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

b) What is Biosensor explain its types. **[4]**

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

a) Secondary metabolites.

b) Applications of enzymes.

c) Organic acids.

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Total No. of Questions : 5]

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M.Sc. BOTANY - II

BODT243E : Seed Technology

(2019 Pattern) (Semester - IV)

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) ***Q.2 to Q.5 carry equal marks.***

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

a) Define seed pathology.

b) Define seed storage.

c) What is field inspection?

d) Give the types of seed legislation.

e) Define seed packaging.

f) Mention any two chemicals that are used for seed treatment.

Q2) a) Describe the procedure and observations during field inspection. **[6]**

b) Give the minimum seed certification standards. **[4]**

Q3) a) Explain in detail steps in seed processing. **[6]**

b) Explain any two positive and negative interactions between insects and plants. **[4]**

P.T.O.

Q4) a) Give the detailed account of ideal ware house for seed storage, fumigation and dehumidification. **[6]**

b) Explain general lay out of seed processing unit with neat labelled diagram. **[4]**

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

a) Seed deterioration.

b) Central seed committee & seed certification board.

c) Important seed pest - Rice Wiveel

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Total No. of Questions : 5]

SEAT No. :

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[5836] - 408
S.Y. M.Sc
BOTANY
BODT - 244 : Plant Tissue Culture Technology
(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.2 to Q.5.***
3) ***Q.2 to Q.5 carry equal marks.***

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

a) What is totipotency?

b) Define organogenesis.

c) What is somaclonal variation?

d) Define Biotransformation.

e) What are secondary metabolites?

f) Enlist the types of direct DNA transfer methods to plants.

Q2) a) Describe the method of somatic hybridization. **[6]**

b) Comment on - In vitro production of haploid. Add note on their applications. **[4]**

Q3) a) Explain in detail - Genetic transformation of plant using Agrobacterionm based vectors. **[6]**

b) Give insights on Immobilization of cells. **[4]**

P.T.O.

Q4) a) Describe the process of de - differentiation and re- differentiation. **[6]**

b) Explain various factors affecting the transformation. **[4]**

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

a) Electroporation.

b) Mechanism of integration of DNA into plant genome.

c) Ex - situ conservation of germplasm.

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Total No. of Questions : 5]

SEAT No. :

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M.Sc (Botany)

BODT 244 : HERBAL TECHNOLOGY

(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.2 to Q.5.***
3) ***Q.2 to Q.5 carry equal marks.***

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

a) Enlist any two medicinal plants used as a source of alkaloids.

b) Define IPR.

c) Write in short on Bhasma.

d) Enlist any two names of medicinal mushrooms.

e) What is mean by antioxidants?

f) Give any two names of herbal products in cosmetics.

Q2) a) Write a note on herbs as a source of probiotics and prebiotics. **[6]**

b) Write in brief on Aristas. **[4]**

Q3) a) Give in detailed description on herbal plants used in dyes and aromaticoils. **[6]**

b) Write in brief guidelines of charak samhita for assessment of herbal products. **[4]**

P.T.O.

Q4) a) What is farmers right? Give in detail case study of Curcuma. **[6]**

b) Define Herbal technology. Give in detailed concept and prospectors it. **[4]**

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

a) Give scope and future prospecting of herbal drug Industry.

b) Write a short note on preparation of Asawas.

c) Add a note on processing of herbal raw material.

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Total No. of Questions : 5]

SEAT No. : ____

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S.Y. M.Sc. (Botany)

244: Research Methodology

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

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Attempt any three questions from Q2 to Q5.***
3) ***Q2 to Q5 carry equal marks.***

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

a) What is copy right?

b) Enlist different types of charts/graphs.

c) What is data analysis?

d) Enlist the software used for plagiarism.

e) What is meant by applied Research?

f) Enlist Scientific writing rules.

Q2) a) Discuss important features of model organism used in genetics and molecular biology. **[6]**

b) What precautions have to be taken during writing research report. **[4]**

Q3) a) What is reproducibility? How is it related to scientific research. **[6]**

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

P.T.O.

Q4) a) Discuss the concept, importance and sources of literature review. **[6]**

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

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

a) Importance of applied research.

b) Rules of power point making.

c) Qualitative and Quantitative research methodology.

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