Total No. of Questions : 7]

SEAT No. : ____

PC-3888

[Total No. of Pages : 2

[6342] - 101
M.Sc.-I
BOTANY
BOUT-111: Plant Systematics - I
(2019 Pattern) (Semester - I) (Paper - I)

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

Instructions to the candidates:

1) ***Q. 1 is compulsory.***
2) ***Solve any 5 questions from Q. 2 to Q. 7.***
3) ***Questions 2 to 7 carry equal marks.***

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

a) Give two horticultural applications of Bryophytes. **[2]**

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

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

d) Give two distinguishing characters of deuteromycotina. **[2]**

e) Give two applications of fungi in medicines. **[2]**

f) Define taxonomy and give any two principles. **[2]**

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

b) Describe ultrastructure of heterocyst and give its significance. **[5]**

P.T.O.

Q3) a) Give distinguishing characters and fruit bodies in myxomycotina. **[7]**

b) Discuss morphology and reproduction in phaeophyta. **[5]**

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

b) Explain the theory of sterilization of evolution of sporophyte in Bryophytes. **[5]**

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

b) Describe thallus structure in fungi. **[5]**

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

b) Give distinguishing characters and thallus structure of zygomycotina. **[5]**

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

a) Mode of perennation in Algae. **[6]**

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

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

Total No. of Questions : 7]

SEAT No. :

PC3889

[Total No. of Pages : 2

[6342]-102
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) ***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 diagrams must be drawn wherever necessary.***
5) ***Figures to the right indicate full marks.***

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

a) Define cell

b) What is mean by primary wall

c) Define Receptor

d) What is cell cycle

e) Evolution

f) Mitosis

Q2) a) Explain the ultrastructure and function of Golgi complex. **[7]**

b) What is Gaint chromosome? **[5]**

Q3) a) Comment on ABA mediated stomatal opening and closure. **[7]**

b) What is signalling molecule? Give it's significant role in the signalling transduction. **[5]**

P.T.O.

Q4) a) Comment on CDK and their regulation in cell cycle. **[7]**

b) Write a note on cell senescence. **[5]**

Q5) a) Elaborate the theory of Darwinism. **[7]**

b) What is phylogeny? **[5]**

Q6) a) Comment on the Biogenesis of chloroplast. **[7]**

b) Write a note on microtubules. **[5]**

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

a) Phospholipase-C signalling.

b) Labelled mitotic curve.

c) Oparin and Haldane concept.

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Total No. of Questions : 7]

SEAT No. :

PC3890

[Total No. of Pages : 2

[6342]-103

First Year M.Sc.

BOTANY

BOUT 113 : Cytogenetics and Plant Breeding

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

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

Instructions to the candidates:

1) ***Question No.1 is compulsory.***
2) ***Solve any five questions from question 2 to question 7.***
3) ***Questions 2 to 7 carry equal marks.***
4) ***Figures to the right indicates full marks.***

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

a) State Mendel's law of independent assortment.

b) What is aneuploidy?

c) Define effectiveness & efficiency in M_2 generation.

d) What is Cryopreservation?

e) Give any two importance of plant genetic resources.

f) What is back cross?

Q2) a) Explain mitochondrial inheritance with suitable example. **[7]**

b) Describe the chromosomal theory of inheritance. **[5]**

Q3) a) Explain conjugation method of genetic transfer. **[7]**

b) Give the applications of aneuploids. **[5]**

P.T.O.

Q4) a) Describe the principles of combination breeding & give it's application. **[7]**

b) Give the treatment methods of physical & chemical mutagens. **[5]**

Q5) a) Explain the effect of mutagens in M_1 generation. **[7]**

b) Describe the modes of pollination. **[5]**

Q6) a) Explain the fine structure of T_4 bacteriophage with neat labelled diagram. **[7]**

b) Describe *Arabidopsis* as a model system in genetics. **[5]**

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

a) Use of mutagens in genomics.

b) Plant quarantine & phytosanitary certification.

c) Success stories in vaccines.

Total No. of Questions : 5]

SEAT No. : ____

PC3891

[Total No. of Pages : 2

[6342]-104

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

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

a) Enlist genetically modified microorganisms.
b) What is algal technology?
c) Enlist strains of PSB.
d) What is biohydrogen?
e) What is biofertilizers?
f) Define SCP.

Q2) a) Describe the potential of algae as pharmaceuticals & neutraceuticals. **[6]**
b) Explain mycorrhizae as a biofertilizers. **[4]**

Q3) a) Give an agronomic importance of biofertilizers. **[6]**
b) Describe the methods of preparation of seaweed biofertilizers. **[4]**

Q4) a) Comment on Agas production method by algae. **[6]**
b) Write on need & significance of biofertilizers. **[4]**

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

a) Azotobacter as a biopesticides.
b) Cultivation of algae for extraction of biodiesel.
c) Strain selection multiplication for biofertilizers.

P.T.O.

Total No. of Questions : 5]

PC3891

[6342]-104

M.Sc. - I

BOTANY

BODT 114(B) : Promoculture and Fruit Processing Technology

2019 Pattern) (Semester - I)

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

Instructions to the candidates:

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

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

a) Write advantages of contour system.
b) Define harvesting.
c) Name any two fermented products of alcoholic drinks.
d) Write any two scopes of fruit crops.
e) What is fruit setting?
f) Mention any two methods of preservation.

Q2) a) Explain the technology of post harvest handling. **[6]**

b) Comment on importance of fruit growing in India. **[4]**

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

b) Comment on export potential of fruits. **[4]**

Q4) a) Write an account of manufacture of champagne. **[6]**

b) Comment on Bahar treatment. **[4]**

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

a) Problems of fruiting.
b) Importance of fruit crops.
c) Principles of preservation.

Total No. of Questions : 7]

SEAT No. :

PC3892

[Total No. of Pages :2

[6342]-201

First Year M.Sc.

BOTANY

BOUT-121 : Plant Systematics - II

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

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

Instructions to the candidates:

1) ***Question No. 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) What is apogamy?

b) Give any two medicinal applications of pteridophytes.

c) Write any two characteristics of gymnosperms.

d) Give any two distinguishing characters of family Hydathellaceae.

e) Write any two affinities of gymnosperms with pteridophytes.

f) What is polyphyly?

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

b) Write the diagnostic characters of family Magnoliaceae. **[5]**

Q3) a) Give the general characters and affinities of Ephedrales. **[7]**

b) Write the diagnostic characters of family Leguminosae. **[5]**

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

b) Write the economic importance of Gymnosperms. **[5]**

P.T.O.

Q5) a) Give the comparative account of embryology and interrelationship of cycadales and Ginkgoales. **[7]**

b) Explain the morphology of gametophyte of Isoetales. **[5]**

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

b) Explain phylogenetic tree of Angiosperms. **[5]**

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

a) Post-Darwinian system of classification.

b) Stelar evolution.

c) APG-IV system of classification.

Total No. of Questions : 7]

SEAT No. :

PC3893

[Total No. of Pages : 2

[6342]-202
First Year M.Sc.
BOTANY
BOUT-122: Molecular Biology
(2019 Pattern) (Semester - II)

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

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Solve any 5 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 molecular biology.

b) What is mismatch repair?

c) Enhancer gene.

d) Refrigerator.

e) Base analogs.

f) Spliceosome.

Q2) a) Application of Thermal cycler, Refractometer and Liquid handling system in molecular biology. **[7]**

b) Describe the genome packaging in viruses / cell organelles. **[5]**

Q3) a) Explain the Arabinose operon model. **[7]**

b) Give correct account of RNA polymerase in eukaryotes. **[5]**

Q4) a) Describe the structure of DNA polymerase in prokaryotes / eukaryotes. **[7]**

b) What is DNA sequencing techniques? **[5]**

P.T.O.

Q5) a) Give the diagrammatic representation of mechanism of translation in prokaryotes. **[7]**

b) Write a note on Transposons mediated gene tugging. **[5]**

Q6) a) Explain 'A', 'B' and 'Z' forms of DNA. **[7]**

b) What are restriction endonucleases? **[5]**

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

a) Explain the objectives and methodology of proteomics.

b) Explain the different classes of promoters in gene organisation.

c) Give an brief account of human genome project.

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Total No. of Questions : 7]

SEAT No. : [ ]

PC3894

[Total No. of Pages : 2

[6342]-203

M.Sc. - I

BOTANY

BOUT 123 : Biochemistry

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

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

Instructions to the candidates:

1) ***Question No. 1 is compulsory.***
2) ***Solve any five questions from Q2 to Q7.***
3) ***Q2 to Q7 carry equal marks.***
4) ***Figures to the right indicate full marks.***

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

a) Give the properties of water.

b) Draw a structure of glycine.

c) Write a role of alkaloids.

d) What is difference between primary and secondary metabolites?

e) Write about functions of haemoglobin.

f) Write any four properties of lipids.

Q2) a) Explain different factors affecting on enzyme activity. **[7]**

b) Describe the β-oxidation of lipids. **[5]**

Q3) a) Give the classification of terpenes. Mention the properties of it. **[7]**

b) Explain Michaelis - Menton equation. **[5]**

P.T.O.

Q4) a) Describe different extraction methods use in the phytochemical investigation. **[7]**

b) Explain the mechanism of ammonium assimilation. **[5]**

Q5) a) Write about classification of amino acids with suitable examples. **[7]**

b) Explain the properties of alkaloids and phenolics. **[5]**

Q6) a) Draw a structure of phenol. Describe the biosynthetic pathway of phenol. **[7]**

b) Write about breakdown of glucose. Explain with suitable example. **[5]**

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

a) Plant pigments

b) NOD factors

c) Nucleic acids

Total No. of Questions : 5]

SEAT No. :

PC3895

[Total No. of Pages : 4

[6342]-204

M.Sc. - I

BOTANY

BODT - 124 (A) : Floriculture and Nursery Management

(2019 Pattern) (Semester - II)

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

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5.***
3) ***Questions No. 2 to 5 carry equal marks.***
4) ***Figures to the right indicate full marks.***

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

a) Enlist types of Nurseries.

b) Define floriculture.

c) Write any two importance of floriculture.

d) Enlist growth regulators in floriculture.

e) What is seed procurement.

f) What is nursery management.

Q2) a) Describe processing of packing and storage of flowers. **[6]**

b) Comment on soil and size of nursery. **[4]**

Q3) a) Explain the role of field preparation and systems of planting in commercial floriculture. **[6]**

b) Write in brief about process of harvesting grading, packing and transport of chrysanthemum. **[4]**

P.T.O.

Q4) a) Comment on germination beds, transplant and weed control in Nursery management. **[6]**

b) Describe the process of 'T' Budding. **[4]**

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

a) Growing media for trans plant beds.

b) Soil, climate and manuring of Tuberose.

c) Transplanting area and germination section in Nursery layout.

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Total No. of Questions : 5]

PC3895

[6342]-204

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) ***Question 1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5.***
3) ***Questions No. 2 to 5 carry equal marks.***
4) ***Figures to the right indicates full marks.***

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

a) Mention any two nutritional component of a mushroom.

b) What is amensalism.

c) Define myconematicides.

d) Enlist any two edible mushrooms.

e) What is cropping?

f) Enlist any two pests in mushroom cultivation.

Q2) a) Describe the steps in cultivation of paddy straw mushroom. **[6]**

b) Give an account of mycorrhizal fungi as biocontrol agent. **[4]**

Q3) a) Explain any two methods of biological control in field. **[6]**

b) Give an account of spawn preparation in mushrom cultivation. **[4]**

Q4) a) Describe the role of mycoherbicides as biocontrol agent. **[6]**

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

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

a) History of mushroom cultivation.

b) Concept of biological control.

c) Edible and non edible mushrooms.

Total No. of Questions : 7]

SEAT No. :

PC-3896

[Total No. of Pages : 2

[6342]-301
S.Y. M.Sc.
Botany
BOUT-231: COMPUTATIONAL BOTANY
(2019 Credit 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 Q.7 carry equal marks.***
4) ***Figures to the right indicate full marks.***

Q1) **Answer Any Five of the following:** **[10]**

a) Define mode with appropriate example.

b) What is a buffer?

c) Write any 4 functional uses of statistical softwares.

d) What is a patent?

e) Define FASTA.

f) What are moles?

Q2) a) What is correlation? Explain in detail spearman's rank correlation. **[7]**

b) Give a brief account on logical organization of scientific data and documentation. **[5]**

Q3) a) What do you mean by measures of central tendency? Give detail account on mean and median. **[7]**

b) Enlist statistical softwares used for biological data analysis. Explain in brief any one of them. **[5]**

P.T.O.

Q4) a) Explain in detail mann-whitney U test. **[7]**

b) Write a detail account on scientific communications? Write down steps involved in research paper writing. **[5]**

Q5) a) What is spectrophotometry? A solution is prepared by mixing 10g of calcium chloride solution. Calculate the molarity of the calcium chloride solution if the volume of the solution is 200ml ($CaCl_2$ mw: 110.98 g/mol) **[7]**

b) Two referees in a flower beauty competition rank the 10 types of flowers as flowers: **[5]**

Refree A	1	6	5	10	3	2	4	9	7	8
Refree B	6	4	9	8	1	2	3	10	5	7

Use the rank correlation coefficient and find out what degree of agreement is there between referees?

Q6) a) What is data retrival tools in Bioinformatics? Explain PubMed and OMIM. **[7]**

b) Explain sampling and sampling distribution and add a note on methods of sampling. **[5]**

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

a) Measures of dispersion.

b) Types of sequences used in Bioinformatics.

c) Oral forms of scientific communication.

Total No. of Questions : 7]

SEAT No. : ____

PC3897

[Total No. of Pages : 2

[6342]-302
S.Y.M.Sc.
BOTANY
BOUT-232 : Developmental Botany
(2019 Pattern) (CBCS) (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 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) Define specification.

b) Define Didifferentiation.

c) What is photomorphogenesis.

d) Define Juvenility.

e) Define potency

f) Comment on stem cells.

Q2) a) Discuss on the genetics and Epigenetic mechanism of vernalization. **[7]**

b) Comment on shoot development. **[5]**

Q3) a) Define symmetry. Explain its Type in detail. **[7]**

b) Explain Radial and axile Pattern of development. **[5]**

P.T.O.

Q4) a) Explain Root and Root Hair development. **[7]**

b) Explain In details microsporogenesis. **[5]**

Q5) a) Give an account on development of female gametophyte with suitable diagram. **[7]**

b) Explain mutant in development. **[5]**

Q6) a) Discuss the difference between plant and animal development. **[7]**

b) What is Embryo Explain their type. **[5]**

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

a) ABC model of flower development

b) Polyembryony

c) Enlist gene involve in shoot development.

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Total No. of Questions : 7]

SEAT No. : ____

PC3898

[Total No. of Pages : 2

[6342]-303
M.Sc. (Part - II)
BOTANY
BOUT-233: Plant Physiology
(2019 CBCS Pattern) (Semester - III)

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

Instructions to the candidates:

1) ***Question No.1 is compulsory.***
2) ***Attempt any 5 questions from Q.2 to Q.7.***
3) ***Questions 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 photosynthesis?

b) Enlist essential elements.

c) Role of auxin.

d) What is Respiration?

e) Give the type of seed dormancy.

f) Define CAM Pathway.

Q2) a) Explain C_3 pathway with significance. **[7]**

b) Write the water potential & factor influencing transport of water. **[5]**

Q3) a) Schematic presentation of Glycolysis & their significance. **[7]**

b) What is plant growth regulator? Explain types & physiological roles of auxin & cytokinin. **[5]**

Q4) a) Describe various types of seed dormancy & methods of break dormancy. **[7]**

b) Explain the significance of Lipids. **[5]**

P.T.O.

Q5) a) What are C_4 plants? Explain mechanism of carbon assimilation in C_4 plants. **[7]**

b) Explain machanism of stomata opening & closing. **[5]**

Q6) a) Explain Active & passive transport role of ATPase & PPase. **[7]**

b) Discuss fatty acid biosynthesis. **[5]**

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

a) Methods of application of fertilizers.

b) Photosystem I & II

c) Secondary metabolite synthesis pathway.

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Total No. of Questions : 5]

SEAT No. : [ ]

PC3899

[Total No. of Pages : 2

[6342]-304

M.Sc. (Part - II)

BOTANY

BODT-234 : Mycology

(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) ***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) Write any two affinities of fungi with plants.

b) Define mycology.

c) What is haplobiontic life cycle.

d) Define coenocytic fungi.

e) What is plasmogamy?

f) Define Heterothallic fungi.

Q2) a) Describe the general characters and structural vatiations in myxomycetes. **[6]**

b) Give an outline of webster and webster (2007) system of classification of fungi upto order. **[4]**

P.T.O.

Q3) a) Describe the general characters and structural variations in discomycetes. **[6]**

b) Write the general characteristics of basidiomycota. **[4]**

Q4) a) Write general characters and structural variations in oomycota. **[6]**

b) Comment on reproduction in ascomycetes. **[4]**

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

a) General characters of polypares.

b) Asexual reproduction in zygomycetes.

c) Trichomycete.

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Total No. of Questions : 5]

SEAT No. : ____

PC3900

[Total No. of Pages : 2

[6342]-305

M.Sc. (Part - II)

BOTANY

BODT-234B : Angiosperm Taxonomy

(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) ***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 Biodiversity.

b) What is endemism.

c) Define Floras.

d) Write full form of IUCN.

e) Define Palynotaxonomy.

f) What is Precipitation reaction.

Q2) a) Describe methods of conservation. **[6]**

b) Write a note on PCR. **[4]**

P.T.O.

Q3) a) Give applications of SEM and TEM in plant systematics. **[6]**

b) Define herbaria. Comment on important herbaria of the world. **[4]**

Q4) a) What is ICN. Discuss principles of ICN. **[6]**

b) Describe various steps involved in RFLP. **[4]**

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

a) RAPD.

b) Pollen characters of taxonomic importance.

c) Morphological features used in identification.

Total No. of Questions : 5]

SEAT No. : ____

PC3901

[Total No. of Pages : 2

[6342]-306

M.Sc. (Part - II)

BOTANY

BODT-234C : Plant Ecology

(2019 Pattern) (CBCS) (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) ***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 autecology.

b) What is topography?

c) Write about carnivory.

d) Define food web.

e) What is applied ecology?

f) Write about climax in succession.

Q2) a) Explain any two characteristics of community. **[6]**

b) Describe structure and function of grassland ecosystem. **[4]**

P.T.O.

Q3) a) Explain any two floristic regions of Maharashtra. **[6]**

b) Describe any one characteristic of population. **[4]**

Q4) a) Enlist environmental factors controlling plant distributions and explain any one of them. **[6]**

b) Describe biodiversity management approach. **[4]**

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

a) Fresh water ecosystem.

b) Ecological indicator plants.

c) Concept of metapopulation.

Total No. of Questions : 5]

SEAT No. : ____

PC3902

[Total No. of Pages : 2

[6342]-307

M.Sc. (Part - II)

BOTANY

BODT-234D : Plant Biotechnology

(2019 Pattern) (CBCS) (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) ***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 micropropagation.

b) What is mean by environmental biotechnology?

c) Define plant virus vector.

d) What is cybrid?

e) Define patent.

f) Define plant tissue culture.

Q2) a) Give the applications of transgenic plants in biotic & abiotic stress resistance. **[6]**

b) Comment on plant derived vaccines. **[4]**

P.T.O.

Q3) a) Explain various biotechnological methods of pollution management. **[6]**

b) Write a note on air pollution and it's control. **[4]**

Q4) a) Define biosafety. Write it's objectives & biosafety guidelines in India. **[6]**

b) Describe the structure of Tabacco mosaic virus. **[4]**

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

a) Ti Plasmid Structure.

b) Scope & importance of plant genetic engineering.

c) Plant breeder's rights.

x x x

Total No. of Questions : 5]

SEAT No. : ____

PC3903

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[6342]-308

M.Sc. (Part - II)

BOTANY

BODT-234E : Genetics & Plant Breeding

(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) ***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 G. banding?

b) Define transposable elements.

c) What is Assortive mating?

d) Define Interspecific variations.

e) What is QTL mapping?

f) Define Intellectual property Right.

Q2) a) Explain the different types of chromosome banding. **[6]**

b) Explain the plant breeders Right. **[4]**

P.T.O.

Q3) a) Give an accounts on classification of markers. **[6]**

b) Describe the Hardy Weinbergs principle. **[4]**

Q4) a) Give an account on types of hybridization in details. **[6]**

b) Explain the simple measures of variability. **[4]**

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

a) Transposable elements in maize.

b) Partial correlation.

c) Geographical Indications.

x x x

Total No. of Questions : 5]

SEAT No. : ____

PC3904

[Total No. of Pages : 2

[6342]-309

M.Sc. (Part - II)

BOTANY

BODT-234F : Seed Science

(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) ***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 the definition of seed?

b) What is seed Germination?

c) What is DNA Fingerprinting?

d) Give the full form of RAPD.

e) What is male sterility?

f) What is orthodoze seed?

Q2) a) What is the role of seed technology in improving crop yield? **[6]**

b) Explain the breaking of seed dormancy. **[4]**

P.T.O.

Q3) a) Explain in details of Physical purity analysis. **[6]**

b) Describe the seed production process in Okra. **[4]**

Q4) a) What is the purpose of the seed coat and how does it protect the seed from Environmental Factors? **[6]**

b) Describe the general procedure for seed sampling. **[4]**

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

a) What is germination testing and why is it crucial in seed evaluation.

b) Difference between systemic and contact pesticides.

c) Importance of Physical purity analysis.

x x x

Total No. of Questions : 7]

SEAT No. :

PC3905

[Total No. of Pages :2

[6342]-401

S.Y.M.Sc.

BOTANY

BOUT-241 : Botanical Techniques

(2019 Pattern) (Semester- IV)

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

Instructions to the candidates:

1) ***Question 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) Define magnification.

b) What is microtomy?

c) What do you mean by electrophoresis techniques?

d) Define ELISA.

e) What is principle of centrifugation?

f) What is IR Spectroscopy?

Q2) a) Explain different microscopic techniques to study plant tissues & cells. **[7]**

b) Discuss the technique of micrometry. **[5]**

Q3) a) Give the detailed account of principle, method and aplications of paper chromatography. **[7]**

b) Give an account of ion exchange chromatography. **[5]**

Q4) a) State Beer & Lambert's Law. Explain the general principle of spectroscopic technique. **[7]**

b) Discuss any two radioactive techniques. **[5]**

P.T.O.

Q5) a) Explain the molecular tools used in protein & nucleotide sequence analysis. **[7]**

b) Discuss the features of digital herbarium. **[5]**

Q6) a) Give an account of data retrival tools used in molecular biology. **[7]**

b) Explain two-dimentional gel electrophoresis. **[5]**

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

a) Column Chromatography.

b) X-ray Crystallography.

c) Autoradiography.

Total No. of Questions : 7]

SEAT No. :

PC3906

[Total No. of Pages : 2

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S.Y.M.Sc.

BOTANY

BOUT 242 : Advanced Ecology

(2019 Pattern) (Semester - IV)

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

Instructions to the candidates:

1) ***Q.1. is compulsory.***
2) ***Attempt any three 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 beta diversity?

b) What are Biomes?

c) Define Environmental Biotechnology.

d) Name two Biofertilizers.

e) Name two Botanical Gardens from India.

f) What is environmental Impact assessment?

Q2) a) Explain the Agro ecological zones of India. Add a note on its characteristics. **[7]**

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

Q3) a) What are different environmental issues & how the plants help in management. **[7]**

b) What is Phytoremediation? Explain its types. **[5]**

P.T.O.

Q4) a) Explain the concept and characteristics of ecological enviromental ethics. **[7]**

b) Discuss overview of Environmental Laws in India. **[5]**

Q5) a) Explain the concept and role of Bio - indicators in controlling environmental degradation. **[7]**

b) Discuss about Environmental Impact Statement and Environmental Management plan (EMP). **[5]**

Q6) a) Explain major approaches to management and methods of conservation of biodiversity. **[7]**

b) Discuss the concept and classification. **[5]**

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

a) Bio piracy & Bio - prospecting

b) Estuarine ecosystem

c) National Forest Policy (1988)

■■■■

Total No. of Questions : 5]

SEAT No. : ____

PC3907

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S.Y. M.Sc.

BOTANY

BODT 243 (A) : Applied Mycology

(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 Q2 to Q5.***
3) ***Q2 to Q5 carry equal marks.***

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

a) What is downy mildew?

b) What is Harting net?

c) Enlist any two names of edible mushroom.

d) What is seed pothology?

e) What is Deep mycosis?

f) Define Industrial mycology.

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

b) Write in brief about fungal enzymes. **[4]**

Q3) a) Define spawn. Describe spawn production in brief. **[6]**

b) Discuss in brief about the role of fungi in Biodegradation. **[4]**

P.T.O.

Q4) a) Define mycorrhizae & its types. Describe significance of mycorrhizae. **[6]**

b) Explain the different steps followed in koch's postulates. **[4]**

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

a) The role of fungi in the control of weeds.

b) Medicinal uses of mushroom.

c) The role of fungi in agriculture.

Total No. of Questions : 5]

SEAT No. : ____

PC3908

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S.Y. M.Sc.

BOTANY - II

BODT 243 (b) : Advanced Medicinal Botany

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

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

a) Write any two example of Natural Pesticides.

b) What are Glycosides?

c) Enlist any two aromatic plants in India.

d) What is drug adoltration?

e) Define crude drugs.

f) What is pharma cognoncy?

Q2) Attempt the following.

a) Write application of Vasaca & Safed Musali. **[6]**

b) Write a note on immunomodulatory plants? **[4]**

Q3) Attempt the following.

a) Describe neutraceuticals & cosmeceuticals. **[6]**

b) Give the significance of neem as a natural pesticides. **[4]**

P.T.O.

Q4) Attempt the following.

a) Elaborate the pharma cognostic importance of Turmeric. **[6]**

b) Mention macroscopic & organoleptic character of Arjuna. **[4]**

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

a) Marine drugs

b) Applications of Brahmi

c) Biosynthesis of Alkaloids

Total No. of Questions : 5]

SEAT No. : ____

PC3909

[Total No. of Pages : 2

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S.Y. M.Sc.

BOTANY

BODT 243 (C) : Advanced Plant Physiology

(2019 Pattern) (Semester - IV)

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

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Solve any three question from Q.2 to Q.5.***
3) ***Q.2 & Q.5 carry equal marks.***

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

a) Compensation point means what?

b) What is photoprotection?

c) Define stress.

d) Define tolerance.

e) Write any two names of Herbicide.

f) What is mean by water - water cycle.

Q2) a) Comment on cyanide resistant pathway in respiration. **[6]**

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

Q3) a) Explain the organization of photosystem. **[6]**

b) Comment on the photosynthetic assimilation during the vegetative phase. **[4]**

P.T.O.

Q4) a) Elaborate the physiological protection mechanism against salt stress. **[6]**

b) Explain the various methods of flower storage. **[4]**

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

a) Significance of C3 pathway

b) Chlorophyll fluoresance

c) Fruit Riperning

Total No. of Questions : 5]

SEAT No. : ____

PC3910

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S.Y. M.Sc.

BOTANY

BODT 243 (D) : Industrial Biotechnology

(2019 Pattern) (Semester - IV)

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

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Solve any three question from Q.2 to Q.5.***
3) ***Q.2 & Q.5 carry equal marks.***

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

a) What are secondary metabolites?

b) Write any two industrial enzymes.

c) What is biochip?

d) Define phytoremediation.

e) What is SCP?

f) Wrire any two applications of nanomaterials.

Q2) a) Describe the process of production of citric acid. **[6]**

b) Give an account of microbial foods. **[4]**

Q3) a) Discuss applications of enzymes. **[6]**

b) Define bioplastics. Add a note on its types & uses. **[4]**

P.T.O.

Q4) a) What are wastes? Explain in detail the role of microorganisms in bioremediation of heavy metals. **[6]**

b) Give scope & importance of biotechnology. **[4]**

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

a) Biofuels

b) Economic significance of antibiotics

c) Insitu bioremediation

Total No. of Questions : 5]

SEAT No. : ____

PC3911

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S.Y. M.Sc.

BOTANY

BODT-243 (E) : Seed 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 Q2 to Q5.***
3) ***Q2 & Q5 carry equal marks.***

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

a) Define field inspection.

b) What is quarantine?

c) Give any one example of vegetable crop pest.

d) Enlist any two instruments used in treating seeds.

e) Define fumigation w.r.t. seed storage.

f) What is seed legislation?

Q2) a) Explain the mechanism of seed transmission. **[6]**

b) Write the steps in seed processing. **[4]**

Q3) a) Explain in detail any one storage grain pest w.r.t. life cycle, way of infestation and control measure. **[6]**

b) Describe drum mixer seed treatment equipment. **[4]**

P.T.O.

Q4) a) Comment on sanitation, fumigation, and dehumidification w.r.t. seed storage. **[6]**

b) Write seed legislation in India. **[4]**

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

a) Central seed committee and their function.

b) Duties of seed inspector.

c) Handling of seeds during packing.

Total No. of Questions : 5]

SEAT No. : ____

PC3912

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S.Y.M.Sc.

BOTANY

BODT - 244(A) : Plant Tissue Culture 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) ***Question 2 & 5 carry equal marks.***

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

a) What is de - differenciation?

b) Define Micropropagation.

c) Enlist type of Elicitors with example.

d) What is immobilization?

e) Enlist the secondary metabolites produced by plants.

f) What is cryopreservation?

Q2) a) Explain mechanism of DNA integration in plant genome. **[6]**

b) Write applications of plant tissue culture. **[4]**

Q3) a) Describe the stages of invitro micropropagation. **[6]**

b) Write a note on standardization of culture media. **[4]**

P.T.O.

Q4) a) Comment on Screening and selection of high secondary metabolite producing cell lines. **[6]**

b) Explain somaclonal variation & Write their applications. **[4]**

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

a) Biolistic gene transfer.

b) Protoplast culture.

c) Biotransformation.

Total No. of Questions : 5]

SEAT No. :

PC3913

[Total No. of Pages : 2

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S.Y.M.Sc.
BOTANY
BODT-244 (B) : Herbal 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 question 2 to 5.***
3) ***Question 2 to question 5 carry equal marks.***

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

a) Define patent.

b) Enlist any two medicinal plants as a source of glycosoides.

c) Enlist any two names of herbal products in oral hygiene.

d) Define Farmers rights.

e) Enlist any two herbs as a source of amino acids and carotenoides.

f) Waxes.

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

b) Write a history and scope of herbal medicine. **[4]**

Q3) a) Write short note on patenting. **[6]**

b) Describe stability testing of herbal drugs. **[4]**

P.T.O.

Q4) a) Give description of herbal plants used in product such as aromatic oils and bleaching agents. **[6]**

b) Explain concept and need of packaging. **[4]**

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

a) Herbs as a source of dietaryfibre.

b) Uses of herbal plants on skin and hair care.

c) Arista.

Total No. of Questions : 5]

SEAT No. :

PC3914

[Total No. of Pages : 2

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M.Sc. -II

BOTANY

BODT-244 : Research Methodology

(2019 Pattern) (Semester-IV) (Credit System)

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

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Solve any three questions from question 2 to 5.***
3) ***Question 2 to question 5 carry equal marks.***

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

a) List plagiarism softwares.

b) What is quantitative Research?

c) Enlist various types of graphs used in research.

d) What is copy right?

e) Define Research.

f) Give any two examples of abbreviations with expansions used in scientific research.

Q2) a) Describe in brief model organisms used in physiology & moleculas Biology. **[6]**

b) What precautions need to be taken while drafting a research report. **[4]**

Q3) a) Explain reproducibility in the lights of scienfic research. **[6]**

b) Give a detail account on use of power point presentations in research. **[4]**

P.T.O.

Q4) a) Discuss plagiarism in detail and its need in research field. **[6]**

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

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

a) Descriptive and analytical research.

b) Laboratory record book.

c) Importance of qualitative research.