Total No. of Questions : 7]

SEAT No. : ____

P2564

[Total No. of Pages : 2

[6069]-211

F.Y.M.Sc.

BOTANY

BOUT 121 : Plant Systematics-II

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

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

Instructions to the candidates:

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

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

a) Write economic importance of gymnosperms.

b) Give any two horticultural applications of pteridophytes.

c) What is heterospory?

d) Write any two salient features of angiosperms.

e) Write any two affinities of gymnosperms with pteridophytes.

f) What is paraphyly?

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

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

Q3) a) Explain the affinities of cycadales. **[7]**

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

Q4) a) Explain the general characters and economic importance of family santalaceae. **[7]**

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

P.T.O.

Q5) a) Give the comparative account of sporogenesis and gametogenesis of cycadales and Ginkogales. **[7]**

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

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

b) Describe phylogenetic tree and cladogram. **[5]**

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

a) Importance and need for classification.

b) Stelar evolution.

c) APG IV system of classification.

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Total No. of Questions : 7]

SEAT No. : ____

P2577

[Total No. of Pages : 2

[6069]-411

M.Sc. - II

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) What are radioisotopes?

b) What is digital herbarium?

c) Enlist various steps in micrometry.

d) What is chromatography?

e) Mention any two types of microscopy.

f) What is spectroflurometry?

Q2) a) Explain the mechanism & use of SEM. **[7]**

b) Discuss the role of light, magnification & image formation in microscopy. **[5]**

Q3) a) Give detailed account of principle, working & application of column chromatography. **[7]**

b) Discuss principle, method and application of HPLC. **[5]**

P.T.O.

Q4) a) Explain principle, working & applications of UV spectroscopy. **[7]**

b) Discuss the properties of electromagnetic radiations & molar extinction coefficient. **[5]**

Q5) a) Explain different electrochemical techniques used in Botany. **[7]**

b) Discuss the principle & factors affecting centrifugation. **[5]**

Q6) a) What is bioinformatics? Explain the applications of various molecular tools. **[7]**

b) What is centrifugtion? Explain any one centrifugation technique you have studied. **[5]**

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

a) PAGE

b) NCBI

c) Green fluorescent proteins

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Total No. of Questions : 7]

SEAT No. :

P-2560

[Total No. of Pages : 2

[6069]-111

M.Sc. (Part - I)

BOTANY

BOUT-111 : Plant Systematics - I

(2019 Pattern) (CBCS) (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) ***Question 2 to 7 carry equal marks.***

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

a) Name any two phycologists.

b) What is mycology?

c) Give four examples of algae.

d) Mentions different pigments present in algae.

e) Give two products obtained from fungi.

f) Give two applications of bryophytes.

Q2) a) Explain the thallus structure and characters of myxomycotina. **[7]**

b) Discuss the applications of fungi. **[5]**

Q3) a) Explain the characters of bryophytes and their affinities with thallophytes and pteridophytes. **[7]**

b) Discuss the contribution of any two bryologists. **[5]**

Q4) a) Describe the classification of algae as per Fritsch system (1935). **[7]**

b) Discuss the contribution of mycologists in fungal studies in India & World. **[5]**

P.T.O.

Q5) a) Describe morphology, Reproduction and life cycle pattern of any one Rhodophyta member. **[7]**

b) Discuss reproduction in chlorophyta. **[5]**

Q6) a) Explain the thallus structure and reproduction in bacillariophyta. **[7]**

b) Discuss the distinguishing characters of zygomycotina. **[5]**

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

a) Origin and evolution of sex in Algae

b) Fructifications in Ascomycotina.

c) Apogamy & Apospory w.r.t. Bryophytes.

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Total No. of Questions : 7]

SEAT No. : ____

P2561

[Total No. of Pages : 2

[6069]-112

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) ***Solve any Five questions from Question No.2 to Question No.7.***
3) ***Questions 2 to 7 carry equal marks.***
4) ***Draw neat lebelled diagrms wherever necessary.***

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

a) What are the functions of nucleolus?

b) What is cytoskeleton?

c) What is gene frequency?

d) What is random genetic drift?

e) What is convergent evolution?

f) What is secondary cell wall?

Q2) a) Explain diversity in protein kinases and Phosphatases. **[7]**

b) Explain mechanism of membrane transport in chloroplast. **[5]**

Q3) a) Explain the molecular events taking place during cell cycle. **[7]**

b) Write short note on flow cytometry. **[5]**

Q4) a) Explain G-protein and G-protein coupled receptors. **[7]**

b) Describe the convergent evolution. **[5]**

P.T.O.

Q5) a) Explain the ultrastructure and functions of cell-wall **[7]**

b) Describe lamarkism. **[5]**

Q6) a) Describe the structure and functions of lampbrush chromosome. **[7]**

b) Discuss the concept of RNA world theory. **[5]**

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

a) Molecular clocks.

b) Geological time scale.

c) Glyoxysomes.

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Total No. of Questions : 7]

SEAT No. :

P-2562

[Total No. of Pages : 2

[6069]-113

M.Sc. (Semester - I)

BOTANY

BOUT - 113 : Cytogenetics and Plant Breeding

(2019 Pattern) (Credit System) (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) What are multiple alleles?

b) Define duplication.

c) What do you mean by lethal mutant?

d) Define mutation breeding.

e) Define cross over.

f) What is in vitro mutagenesis?

Q2) a) What is apomixis? give the types and applications of apomixis. **[7]**

b) Define polygenic inheritance. Describe corolla length inheritance in Nicotiana. **[5]**

Q3) a) Give an account of complementary interaction of genes. **[7]**

b) Describe practices of collection and characterization of plant genetic resources. **[5]**

Q4) a) Define Karyotype. Explain chromosome banding techniques. **[7]**

b) What is translocation? Explain BA translocations. **[5]**

P.T.O.

Q5) a) What is selection? Explain in detail purcline selection. **[7]**

b) Describe various method of aneuploids production. **[5]**

Q6) a) Enlist different physical mutagens. Explain mechanism of action of physical mutagens. **[7]**

b) Describe mutation breeding for quality improvement. **[5]**

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

a) Homologous recombination

b) Lytic cycle

c) Applications of plant breeding

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Total No. of Questions : 5]

SEAT No. : ____

P-2563

[Total No. of Pages : 4

[6069]-114
F.Y. M.Sc.
BOTANY
BODT - 114(A) : Biofertilizer & Algal Technology
(2019 Pattern) (Semester - I)

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 2 to 5 carry equal marks.***

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

a) Define algal technology.

b) Mention two materials used as carrier.

c) Name any two cyanobacteria used as biofertilizers.

d) Define mycorrhiza.

e) Give two examples of sea weeds.

f) Name any two algal products.

Q2) a) Explain mass production technique of Azolla. **[6]**

b) Give an account of applications of sea weed fertilizers. **[4]**

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

b) Discuss the quality control measures in biofertilizers. **[4]**

P.T.O.

Q4) a) Explain need and significance of biofertilizers. **[6]**

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

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

a) Mycorrhiza.

b) SCP.

c) Algae as a food & fuel.

x x x

Total No. of Questions : 5]

P-2563

[6069]-114
F.Y. M.Sc.
BOTANY
BODT - 114(B) : Pomoculture and Fruit Processing Technology
(2019 Pattern) (CBCS) (Semester - I) (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 2 to 5 carry equal marks.***

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

a) Give any two nutritive importance of fruit with example.

b) What is Harvesting?

c) What is preservation?

d) Define fermentation.

e) What is mean by carbonated juices.

f) Give importance of fruit harvesting indices.

Q2) a) Explain the present status of fruit production in maharashtra. **[6]**

b) Give significance of post harvesting & handling. **[4]**

Q3) a) Write a note on quincunx system for orchid production. **[6]**

b) Define fermentation and comment on the production of vinegar. **[4]**

Q4) a) Describe the marketing value and strategy for fruits. **[6]**

b) Comment on the production of marmalad. **[4]**

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

a) Role of plant growth hormone.

b) Oil palm waste utilization.

c) Cold storage.

x x x

Total No. of Questions : 7]

SEAT No. : ____

P2564

[Total No. of Pages : 2

[6069]-211

F.Y.M.Sc.

BOTANY

BOUT 121 : Plant Systematics-II

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

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

Instructions to the candidates:

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

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

a) Write economic importance of gymnosperms.

b) Give any two horticultural applications of pteridophytes.

c) What is heterospory?

d) Write any two salient features of angiosperms.

e) Write any two affinities of gymnosperms with pteridophytes.

f) What is paraphyly?

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

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

Q3) a) Explain the affinities of cycadales. **[7]**

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

Q4) a) Explain the general characters and economic importance of family santalaceae. **[7]**

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

P.T.O.

Q5) a) Give the comparative account of sporogenesis and gametogenesis of cycadales and Ginkogales. **[7]**

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

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

b) Describe phylogenetic tree and cladogram. **[5]**

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

a) Importance and need for classification.

b) Stelar evolution.

c) APG IV system of classification.

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Total No. of Questions : 7]

SEAT No. : ____

P-2565

[Total No. of Pages : 2

[6069]-212

M.Sc. - I

BOTANY - I

BOUT-122 : Molecular Biology

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

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

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

a) Enlist any two applications of molecular biology.

b) What is sourthern blotting technique?

c) Define genome.

d) What is splicing?

e) Define proteomics.

f) Define capping.

Q2) a) Explain the type of DNA damages and repair. **[7]**

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

Q3) a) Give an account of coenzymes and factors involved in translation. **[7]**

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

Q4) a) Explain the steps involved in PCR. **[7]**

b) Write a note on Lac-operon. **[5]**

P.T.O.

Q5) a) Explain concept of mobile DNA elements. **[7]**

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

Q6) a) Explain the properties of DNA. **[7]**

b) Comment the base excision repair. **[5]**

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

a) Magnetic stirrer

b) 'B' form of DNA

c) Structure of spliceosome

□□□

Total No. of Questions : 7]

SEAT No. :

P2566

[Total No. of Pages : 1

[6069]-213
M.Sc. - I
BOTANY
BOUT - 123 : Biochemistry
(2019 Pattern) (CBCS) (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) ***Q.2 to Q.7. carry equal marks.***

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

a) Give properties of biological buffers.
b) What is enzyme kinetics?
c) Enlist the properties of RNA molecule.
d) Write functions of myoglobin and haemoglobin.
e) What is Handerson-Hasselback equation?
f) Give therapatic plant sources of terpens and pigments.

Q2) a) Describe the reactions of β-oxidation of lipids. **[7]**

b) Explain phenomenon of glycolysis and its importance. **[5]**

Q3) a) Give general classification of enzyme and factors affecting enzyme activity. **[7]**

b) Describe structure and functions of proteins. **[5]**

Q4) a) Explain Michoelis - Menton equation with example. **[7]**

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

Q5) a) Describe the mechanism of biological nitrogen fixation and its importance. **[7]**

b) Give properties of alkaloids and glycosides. **[5]**

Q6) a) Define secondary metabolites? Describe biosynthetic pathway of phenols. **[7]**

b) Write on different types of inhibitors and their importance. **[5]**

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

a) Starch and glycogen.
b) Laws of thermodynamics.
c) Mechanism of action of enzyme.

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Total No. of Questions : 5]

SEAT No. :

P2567

[Total No. of Pages :2

[6069] - 214

First Year M.Sc.

BOTANY - I

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

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

a) What is floriculture?
b) Enlist different types of nureseries.
c) Write any four weedicides.
d) What is fencing?
e) Enlist the plants used for wind control at nursery site.
f) What is clading material?

Q2) a) Describe the cultivation practices for Gerbesa. **[6]**
b) What are pre-requisites for nursery? **[4]**

Q3) a) Explain the design and layout of nursery. **[6]**
b) Write on special horticultural practices. **[4]**

Q4) a) Discuss scope and importance of floriculture. **[6]**
b) Comment of Grafting technique. **[4]**

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

a) Growing media for seed germination and propagation.
b) Commercial cultivation of Tuberose.
c) Preparation of site for Nursery.

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P.T.O.

Total No. of Questions :5]

P2567

[6069] - 214

First Year M.Sc.

BOTANY - I

BODT - 124 (B) : Mushroom Cultivation and Biopesticide Technology

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

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

a) Give two plant based pesticides.
b) Mention two organisms used in Biological control of pathogens.
c) Define mycoherbicide.
d) Name any two commercially cultivated mushroome.
e) Give two pests associated with cultivation of mushrooms.
f) Name two recipes of Agaricus mushroom.

Q2) a) Describe the method of cultivation of wheat 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 steps involved in preparation of mushroom seed. **[4]**

Q4) a) Discuss the role of biopesticides. **[6]**
b) Give in detail preparation of any two mushroom recipes. **[4]**

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

a) History of mushroom cultivation.
b) Antagonism.
c) Cultivation of paddy straw mushroom.

Total No. of Questions : 7]

SEAT No. : ____

P-2568

[Total No. of Pages : 2

[6069]-311

M.Sc. - II

BOTANY

BOUT-231 : Computational Botany

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

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

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

a) Which are the main sub-discipline of bioinformatics?

b) What is redundant and non-redundant databases?

c) State significance of chi-square test.

d) What is the aim of the design of experiment?

e) What are the assumption of 't' test?

f) What is meant by primary and secondary data?

Q2) a) Give in detailed steps involved in scientific paper writing. **[7]**

b) Calculate molarity of 4gm caustic soda (NaOH) dissolved in 200 ml of solution. **[5]**

Q3) a) Explain concept of mean mode, medium and give its merits and demerits. **[7]**

b) In peas, yellow seeds (A) are dominant over green (a) seeds. In a cross between two plants both heterozygous for seed colour, the following was observed

Yellow = 4400

Green = 1624

Does the data fit the predicted phenotype ratio? **[5]**

P.T.O.

Q4) a) What is scatter diagram? Explain different types of scatter diagram. **[7]**

b) Explain various steps involved in thesis writing. **[5]**

Q5) a) What is data retrieval tools? Explain EMTREZ, OMIM and PubMed. **[7]**

b) The following data relates to the yield in gm(y) and matured pods (x) of 10 groundnut plants work out the correlation coefficient. **[5]**

Q6) a) Explain Dunnet's test for comparison of treatment means with control. State its significance. **[7]**

b) Two varities of Potato (A and B) yielded tubers as shown in table. Does the mean number of tubers of variety A differ significantly from that variety B mean yield is in kg/plant. **[5]**

No. of plant	1	2	3	4	5	6	7	8	9	10
Variety A	10	11	12	13	15	12	16	10	15	16
Variety B	12	13	14	15	16	20	25	15	18	12

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

a) Skewness and Kurtosis

b) Moles and Molarity

c) NCBI

Total No. of Questions : 7]

SEAT No. : ____

P2569

[Total No. of Pages : 2

[6069]-312

M.Sc.-II

BOTANY

BOUT 232 : Developmental Botany

(2019 Pattern) (Semester - III)

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

Instructions to the candidates:

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

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

a) What is commitment?

b) Define specification.

c) What is morphogenesis?

d) Define embryogenesis.

e) What is determination?

f) What is cell fate?

Q2) a) Give an account of effect of intrinsic factors affecting plant development. **[7]**

b) Define symmetry. Explain its types. **[5]**

Q3) a) What is cell potency? Discuss various types of potencies. **[7]**

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

Q4) a) Define stem cells. Describe its types. Add a note on its role in developmental botany. **[7]**

b) Explain in detail microsporogenesis. **[5]**

P.T.O.

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

b) Write a note on reproductive structures in plant. **[5]**

Q6) a) What is apomixis? Describe recurrent apomixis with suitable diagram. **[7]**

b) Explain molecular basis of leaf development. **[5]**

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

a) ABC model of flower development.

b) Significance of double fertilization.

c) Polyembryony.

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Total No. of Questions : 7]

SEAT No. :

P-2570

[Total No. of Pages : 2

[6069]-313

S.Y. M.Sc.

BOTANY

BOUT - 233 : Plant Physiology

(2019 Pattern) (Semester - III)

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

Instructions to the candidates:

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

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

a) Enlist various soil types.

b) What is active and passive transport?

c) Give the role of ATPase enzyme.

d) What is CAM. Give its example.

e) Give the role of auxins.

f) Mention the significance of alkaloids in plants.

Q2) a) Give an account of properties of water and comment on factors affecting water transport. **[7]**

b) Discuss water conservation strategies in plants. **[5]**

Q3) a) Explain the mechanism of Electron Transport System. **[7]**

b) What is vernalization? Give its significance. **[5]**

Q4) a) Give schematic presentation of TCA cycle. Add a note on its significance. **[7]**

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

P.T.O.

Q5) a) What are C_3 plants. Explain mechanism of carbon assimilation in C_3 plants. **[7]**

b) Describe various types of seed dormancy. **[5]**

Q6) a) Define biotic & abiotic stress. Elaborate on any one abiotic & biotic tolerance mechanism. **[7]**

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

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

a) Secondary metabolite synthesis pathway

b) C_4 cycle

c) Methods of applications of fertilizers

▽▽▽▽

Total No. of Questions : 5]

SEAT No. :

P-2571

[Total No. of Pages : 2

[6069]-314
M.Sc (Part - II)
BOTANY
BODT - 234 : Mycology
(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) ***Q.2 to Q. 5 carry equal marks.***

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

a) What are conidiophores?

b) What are the types of sexual spores?

c) What are coenocytic hyphae?

d) General feature of filamentous fungi.

e) What is a plasmodium?

f) What is obligate parasite.

Q2) a) Give an outline of classification of fungi upto order level proposed by Alexopolus & mims (1979). **[6]**

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

Q3) a) Describe the external and internal structure of polypores. **[6]**

b) Explain fungal affinities with plants and their significance. **[4]**

P.T.O.

Q4) a) Describe the cell structure in fungi with suitable diagram. **[6]**

b) Explain important characteristic of basidiomycota. **[4]**

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

a) Vegetative reproduction in fungi.

b) Hyphomycetes.

c) Plasmodiophoromycetes.

x x x

Total No. of Questions : 5]

SEAT No. : ____

P-2572

[Total No. of Pages : 2

[6069]-315

M.Sc. - II (Semester - III)

BOTANY

BODT-234(b) : Taxonomy of Angiosperms

(2019 Pattern) (Credit System)

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

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

a) What is biodiversity?

b) What do you mean by precipitation reaction?

c) Define revisions.

d) Define polynotaxonomy.

e) What is endemism?

f) Define chemotaxonomy.

Q2) a) Describe various stages in chemotaxonomic investigations. **[6]**

b) Give principles of ICN. **[4]**

Q3) a) Comment on RAPD & Give its applications. **[6]**

b) Write on Botanical Survey of India. **[4]**

P.T.O.

Q4) a) Describe morphological features used in identification. **[6]**

b) Role of herbarium and botanical gardens comment. **[4]**

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

a) RFLP

b) Classes of compounds and their biological significance

c) Anatomical characters of taxonomic importance.

Total No. of Questions : 5]

SEAT No. :

P-2573

[Total No. of Pages : 2

[6069]-316

M.Sc. (Part - II)

BOTANY

BODT-234(C) : Plant Ecology

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

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

Instructions to the candidates:

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

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

a) Define synecology.

b) What is symbiosis?

c) What is meant by extinction?

d) Define Biogeography.

e) Define food web.

f) What is meant by decomposer?

Q2) a) Explain the environmental factors of precipitation and water for controlling plant distribution. **[6]**

b) Comment on Intra-specific interaction. **[4]**

Q3) a) Explain the structure & function of freshwater Ecosystem. **[6]**

b) comment on the vegetation zone of Maharashtra. **[4]**

Q4) a) Explain the measurement of species diversity. **[6]**

b) Comment on life History strategy for ‘r’ & ‘k’ selection. **[4]**

P.T.O.

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

a) Changes involved in succession

b) Concept of limiting factors

c) Biogeochemical cycle of phosphorus

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Total No. of Questions : 5]

SEAT No. :

P-2574

[Total No. of Pages : 2

[6069]-317

S.Y. M.Sc.

BOTANY

BODT-234 (D) : Plant Biotechnology

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

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

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

a) Define Biotechnology.

b) What is a reporter gene?

c) Enlist any two plant virus vectors.

d) Define transgene.

e) Write any two applications of transgenic plants.

f) What is a patent?

Q2) a) What is T_1 plasmid? Describe its structure. **[6]**

b) Explain the role of promoters in gene expression. **[4]**

Q3) a) Give an account of method of isolation of protoplast. **[6]**

b) Write a note on applications of somaclonal variation. **[4]**

Q4) a) What is water pollution? Describe various sources of water pollution. **[6]**

b) Write a note on composition of Sewage. **[4]**

P.T.O.

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

a) Cybrids

b) Biosafety

c) Therapeutic products for human welfare

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Total No. of Questions : 5]

SEAT No. :

P-2575

[Total No. of Pages : 2

[6069]-318

M.Sc. (Part - II)

BOTANY

BODT - 234 (E) : Genetics and Plant Breeding

(2019 Pattern) (Credit System) (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 no. 2 to 5 carry equal marks.***

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

a) What is G banding?

b) What do you mean by genetic instability?

c) What is outbreeding?

d) What is QTL mapping?

e) Define salt toxicity in plants.

f) What are plant breeder's rights?

Q2) a) Give an account on applications of Karyotype analysis in taxonomy. **[6]**

b) Describe Hardy Weinberg Principle. **[4]**

Q3) a) Describe conditions for granting breeding rights. **[6]**

b) Explain IS elements in bacteria. **[4]**

P.T.O.

Q4) a) Give an account on classification of markers. **[6]**

b) Explain interspecific variation. **[4]**

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

a) Giemsa C banding

b) Partial correlation

c) Geographical indications

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Total No. of Questions : 5]

SEAT No. : ____

P-2576

[Total No. of Pages : 2

[6069]-319

S.Y. M.Sc.

BOTANY

BODT - 234 : SEED SCIENCE

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

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

Instructions to the candidates :

1) ***Que.1 is compulsory.***
2) ***Solve any three questions from Que.2 to Que.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 seed?

c) Waht is seed viability?

d) What is a phenol colour test?

e) Give fullform of ELISA.

f) Define self incompatibility.

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

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

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

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

P.T.O.

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

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

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

a) Artificial pollination.

b) Gametocides.

c) Objectives of seed technology

Total No. of Questions : 7]

SEAT No. :

P-2578

[Total No. of Pages : 2

[6069]-412

M.Sc. (Part - II)

BOTANY

BOUT-242 : Advanced Plant Ecology

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

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

Instructions to the candidates:

1) ***Questions 1 is compulsory.***
2) ***Attempt any three 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 species rarefaction?

b) Enlist the forest types of India.

c) What is phytoremediation?

d) Name any two endangered flora.

e) Name two chemical fungicides.

f) What is mutualism.

Q2) a) Explain the concept of ecosystem stability and its impact on plants and ecosystems. **[7]**

b) Discuss any two types of ecosystems in detail. **[5]**

Q3) a) What is concept of restoration ecology. Add a note on endangered and threatened flora of India. **[7]**

b) Discuss the importance and threat to biodiversity. **[5]**

Q4) a) Explain how plants help in conservation and restoration of soil and land. **[7]**

b) Describe the plant relations with edaphic factors. **[5]**

P.T.O.

Q5) a) Explain E/A Guidelines and Impact assessment methodologies. **[7]**

b) Give the guidelines for environmental audit. **[5]**

Q6) a) Describe the forest types of India w.r.t. classification and characteristics. **[7]**

b) Discuss similarity and dissimilarity indices of species diversity. **[5]**

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

a) Ecosystem stability

b) Tropical Rain forest

c) Forest conservation Act (1982-Revised)

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Total No. of Questions : 5]

SEAT No. :

P2579

[Total No. of Pages : 1

[6069]-413
M.Sc. - II
BOTANY
BODT - 243 (A) : Applied Mycology
(2019 Pattern) (CBCS) (Semester - IV)

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

Instructions to the candidates:

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

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

a) What is smut?
b) Enlist any four name of value added products of mushroom.
c) Who is the father of seed pathology.
d) Define plant pathology.
e) Define spawn.
f) What is industrial mycology?

Q2) a) Define medical mycology? Explain it's types in brief. **[6]**
b) Explain role of fungi in fermentation industries. **[4]**

Q3) a) Explain leafspot with suitable example. **[6]**
b) Write short note on role of fungi in production of alcohol. **[4]**

Q4) a) Describe role of fungi in cheese & bread industries. **[6]**
b) Write a note on marketing of mushrooms. **[4]**

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

a) Mycoinsecticides.
b) Importance of market pathology.
c) Mucoprotein.

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Total No. of Questions : 5]

SEAT No. :

P2580

[Total No. of Pages : 1

[6069]-414
S.Y.M.Sc.
BOTANY - II
BODT-243 : Advanced Medicinal Botany
(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) Attempt any five of the following : **[5]**

a) Write botanical name of any two aromatic plants.

b) Write any two macroscopic character of Dioscorea.

c) Give any two properties of natural pesticides.

d) What are Alkaloids?

e) Define Pharmacognocy.

f) Mention parameters of Drug evalution.

Q2) a) Write Source, Macroscopic & Organoleptic character of Ashwagandha. **[6]**

b) Describe the chemical drug evaluation process. **[4]**

Q3) a) Explain the macroscopic & Organoleptic characters of Terminalia arjuna. **[6]**

b) Write applications of Aloe Vera & Shatavari. **[4]**

Q4) Attempt the following :

a) Explain the immunomodulatory effect of medicinal plants. **[6]**

b) Give the significance marine drugs. **[4]**

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

a) Natural excipients.

b) Cosme ceuticals.

c) Glycosides.

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Total No. of Questions : 5]

SEAT No. :

P2581

[Total No. of Pages : 1

[6069]-415
M.Sc. - II
BOTANY
BODT-243(C) : Advanced Plant Physiology
(2019 Pattern) (Semester - IV) (CBCS) (Paper-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) ***Q.2 to Q.5 carry equal marks.***

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

a) Define Dark Reaction.

b) Enlist any two enzymes involved in photoprotection.

c) Give significance of Dark reaction.

d) Enlist any two Abiotic stress on the plants.

e) What is Hypersensitive Response?

f) Give any two bactericides name.

Q2) a) Comment on regulation of C4 pathway. **[6]**

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

Q3) a) Give an account of evolution of PEPcase. **[6]**

b) Enlist and explain the inhibitors or respiration. **[4]**

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

b) Comment on the fruit ripening Indices for storage of fruit. **[4]**

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

a) Significance of CAM pathway.

b) CO_2 Response curve.

c) Post Harvest storage of vegetables.

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Total No. of Questions : 5]

SEAT No. :

P2582

[Total No. of Pages : 1

[6069]-416
M.Sc. - II
BOTANY
BODT - 243 (D) : Industrial Biotechnology
(2019 Pattern) (Semester - IV)

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

Instructions to the candidates:

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

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

a) Define Biotechnology.
b) Enlist any two microbial foods.
c) What are primary metabolites?
d) Write any two applications of enzymes.
e) What is bioremediation?
f) Define bioplastics.

Q2) a) Describe the process of production of any one amino acid. **[6]**
b) Write a note on microbial foods. **[4]**

Q3) a) Give an account of principles and applications of biochip. **[6]**
b) Discuss the applications of Bioremediation. **[4]**

Q4) a) Explain the role of mycorrhizae in biore mediation. **[6]**
b) Discuss the role of nanoparticles in bioremediation. **[4]**

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

a) Bioleaching & Biofilteration.
b) Economic significance of antibiotics.
c) SCP.

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Total No. of Questions : 5]

SEAT No. :

P2583

[Total No. of Pages : 1

[6069]-417
M.Sc. - II
BOTANY
BODT - 243 (E) : Seed Technology
(2019 Pattern) (CBCS) (Semester - IV) (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) ***Q.2 to Q.5. carry equal marks.***

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

a) Define seed Pathology.
b) Give the meaning of seed entomology.
c) What is seed treatment?
d) What is seed deterioration?
e) Define seed legislation?
f) Give any two powers of seed inspector.

Q2) a) Describe any two methods of seed health testing. **[6]**
b) Write objectives of seed processing. **[4]**

Q3) Explain in detail any one pest of fibre crop w.r.t.
a) Its life cycle, way of infestation & control measures. **[6]**
b) Describe slurry seed treatment equipment. **[4]**

Q4) What is seed storage? Give the factors affecting.
a) Seed storage. **[6]**
b) Write on seed legislation in India. **[4]**

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

a) Minimum seed certification standards.
b) Observations during field inspections.
c) Material used for packing.

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Total No. of Questions : 5]

SEAT No. :

P2584

[Total No. of Pages : 1

[6069]-418
M.Sc. - II
BOTANY
BODT - 244 : Plant Tissue Culture Technology
(2019 Pattern) (Semester - 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) ***Question 2 to 5 carry equal marks.***

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

a) Define cybridization.
b) What is immobilization?
c) Enlist plant growth regulators.
d) What are biotic elicitors?
e) Enlist the types of bioreactors.
f) What is germplasm?

Q2) a) Describe in-vitro method of haploid production and give their applications. **[6]**

b) Give an account of factors affecting during DNA transformation. **[4]**

Q3) a) Discuss the production of secondary metabolites by genetic engineering. **[6]**

b) Give and account of organogenesis. **[4]**

Q4) a) Discuss the micropropagation of Banana. **[6]**

b) Explain in detail the transformate analysis methods. **[4]**

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

a) Biolistic gene transfer
b) Protoplast culture
c) Biotransformation

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Total No. of Questions : 5]

SEAT No. :

P2585

[Total No. of Pages : 1

[6069]-419
S.Y. M.Sc.
BOTANY
BODT - 244 : Herbal Technology
(2019 Pattern) (CBCS) (Semester - IV)

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

Instructions to the candidates:

1) ***Q 1 is compulsory.***
2) ***Attempt any three questions from Q2 to Q5.***
3) ***Q 2 to Q 5 carry equal marks.***

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

a) Define IPR.

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

c) Enlist any two names of herbal products in aromatic oils.

d) What is Bhasma?

e) Enlist any two herbs as a source of prebiotics and antioxidants.

f) Define Herbal Technology.

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

b) Describe role of medicinal plants in unani and homeopathy system of medicines. **[4]**

Q3) a) Explain guidelines of charak samhita. **[6]**

b) Give in detail a case study of Neem. **[4]**

Q4) a) Define Herbal Technology. Give in a detail concept and prospects. **[6]**

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

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

a) Preparation of Asawas.

b) Herbal raw material processing.

c) Comment on WHO and ICH guidelines for assessment of herbal products.

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Total No. of Questions : 5]

SEAT No. :

P2586

[Total No. of Pages : 1

[6069]-420
M.Sc. - II
BOTANY
BODT - 244 : Research Methodology
(2019 Pattern) (Credit System) (Semester - IV)

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

Instructions to the candidates:

1) ***Q 1 is compulsory.***
2) ***Solve any three questions from Q2 to Q5.***
3) ***Question 2 to 5 carry equal marks.***

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

a) What is plagiarism.
b) What is data analysis.
c) Enlist rules in scientific writing.
d) What is academic misconduct.
e) Enlist model organism used in genetics.
f) Define Library research.

Q2) a) Describe in brief the model organisms used in Genetics and Physiology. **[6]**

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

Q3) a) What is ethics and good practicals of scientific writing. **[6]**

b) What is Research? Enlist the types of Research. **[4]**

Q4) a) Discuss care to be taken during imaging of tissues and write about importance of scale bars. **[6]**

b) Give a detail account on importance of poster presentations in research. **[4]**

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

a) Applied and fundamental Research.
b) Importance of Applied Research.
c) Key biology research areas.

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