Total No. of Questions : 7]

SEAT No. :

PA-3318

[Total No. of Pages : 2

[5915] - 11
M.Sc. - I
BOTANY
BOUT -111- Plant Systematics-I (Theory)
(2019 Pattern) (Semester-I) (Paper-I)

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

Instructions to the candidates:

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

Q1) Solve any five of the following:

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

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

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

d) Give two types of Fructifications in Deuteromycotina. **[2]**

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

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

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

b) Describe thallus organization in cyanophyta. **[5]**

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

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

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

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

P.T.O.

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

b) Describe hyphal modifications and cell structure in fungi. **[5]**

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

b) Explain heterothalism and sexual reproduction in zygomycotina. **[5]**

Q7) write short notes on any two of the following:

a) Origin and evolution of sex in algae. **[6]**

b) Types and structure of basidia and basidiocarps of Basidiomycotina. **[6]**

c) Asexual and sexual reproduction in chlorophyta. **[6]**

Total No. of Questions : 7]

SEAT No. :

PA-3319

[Total No. of Pages : 2

[5915]-12

M.Sc. - I

BOTANY

BOUT-112 : Cell Biology and Evolution

(CBCS 2019 Pattern) (Semester-I)

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

Instructions to the candidates:

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

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

a) Phospholipids are amphipatic. Explain.

b) Mention the role of water in chemical reactions in a cell.

c) What are oligosaccharides and polysaccharides.

d) Mention differences between DNA and RNA.

e) What is Cytoskeleton.

f) What are secondary Messangers.

Q2) a) Discuss the concept of speciation. **[7]**

b) Explain RNA world theory. **[5]**

Q3) a) Explain the effects of apoptosis on cell - arganelles of the cells. **[7]**

b) Explain co-evolution. **[5]**

Q4) a) Explain the Molecular aspects of programmed cell-death. **[7]**

b) Describe different phases of cell-cycle. **[5]**

P.T.O.

Q5) a) Explain the Molecular Mechanism of transport across Mitochondria. **[7]**

b) Describe Oparine and Haldane concept. **[5]**

Q6) a) Explain the Ultrastructure and functions of Endoplasmic reticulum. **[7]**

b) Describe the role of protein and Nucleotide sequencing in Molecular evolution. **[5]**

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

a) Gene Pool.

b) Diversity of GPCR gene family.

c) Signal transduction.

Total No. of Questions : 7]

SEAT No. :

PA-3320

[Total No. of Pages : 2

[5915]-13

M.Sc. -I

BOTANY

BOUT-113 : Cytogenetics and Plant Breeding and Evolution

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

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

Instructions to the candidates:

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

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

a) Give concept of gene.

b) What is B charomosome?

c) Give importance of E.Coli as a model system.

d) Give importance of adaptation.

e) What are cytoplasmic genes?

f) What is heterozygotic translocation?

Q2) a) Describe gene mapping by tetrad analysis in yeast. **[7]**

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

Q3) a) Explain the mechanism of conjugation in bacteria. **[7]**

b) Describe the method of mutation breeding. **[5]**

Q4) a) Describe major events in the evolutionary time scale. **[7]**

b) Explain the concept of continuous variation. **[5]**

P.T.O.

Q5) a) Describe selection method in corss pollinated crops. **[7]**

b) Write an account of the origin and evolution of eukaryotic cell. **[5]**

Q6) a) Describe types and causes of mutations. **[7]**

b) Write effect of salt toxicity on plants. **[5]**

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

a) Germplasm types and conservation.

b) Molecular tools in phylogeny.

c) Phenomenon of translocation and its importance.

❖ ❖ ❖

Total No. of Questions : 5]

SEAT No. :

PA-3321

[Total No. of Pages : 2

[5915]-14

M.Sc. - I

BOTANY

BODT-114(A) : Biofertilizers & Algal Technology

(2019 Pattern) (Semester-I)

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

Instructions to the candidates:

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

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

a) What is genetically modified organisms?

b) Define SCP.

c) Enlist N_2 fixing cyanobaltesia.

d) What is biofertilizers?

e) Enlist agar yielding algae.

f) What is algal technology?

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

b) Comment on PSB as biofertilizers. **[4]**

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

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

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

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

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

a) Azospirullum as biopesticids.

b) Cultivation of algae for biodiesel extraction.

c) Sterilization techniques for biomass production.

❖ ❖ ❖

Total No. of Questions : 5]

PA-3321

[5915]-14

M.Sc.-I

BOTANY

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

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

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

Instructions to the candidates:

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

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

a) Write advantages of hexagonal system.
b) Enlist fermented products of alcoholic drinks.
c) Define greening.
d) Write scope of fruit crops.
e) Give any two advantages of by product waste utilization.
f) Write any two problems of fruiting.

Q2) a) Explain methods of harvesting technology for ripening. **[6]**
b) Comment on fruit growing plants in Maharashtra. **[4]**

Q3) a) Explain vegetative methods of propagation of fruit trees, give its advantages. **[6]**
b) Comment on systems of marketing of fruits. **[4]**

Q4) a) Describe the process of preparation of Jam and Jelly. **[6]**
b) Comment on role of any two plant growth substances. **[4]**

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

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

❖ ❖ ❖

Total No. of Questions : 7]

SEAT No. :

PA-3322

[Total No. of Pages : 2

[5915]-21

M.Sc. -I

BOTANY - I

BOUT-121 : Plant Systematics-II

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

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

Instructions to the candidates:

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

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

a) Write any two medicinal applications of pteridophytes.

b) What is apospory?

c) Write any two affinities of gymnosperms with pteridophytes.

d) Define parallelism.

e) Give economic importance of gymnosperms.

f) Give any two characteristic features of angiosperms.

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

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

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

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

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

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

P.T.O.

Q5) a) Explain the affinities of pteridospermales. **[7]**

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

Q6) a) Give economic importance of family Arecaceae and Asteraceae. **[7]**

b) Give the APG IV system of classification. **[5]**

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

a) Stelar evolution.

b) Post Darwinian system of classification.

c) Phylogenetic tree and cladogram.

Total No. of Questions : 7]

SEAT No. :

PA-3323

[Total No. of Pages : 2

[5915]-22

M.Sc.-I

BOTANY

BOUT-122 : MOLECULAR BIOLOGY

(CBCS 2019 Pattern) (Semester-II)

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

Instructions to the candidates:

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

Q1) Solve any 5 of the following: **[10]**

a) Write two objectives of proteomics?

b) Define DNA Damage.

c) Write any two factors of DNA replication.

d) Define transcription.

e) Write working principle of incubator.

f) Enlist classes of promoters.

Q2) a) Describe process of transcription prokaryotes. **[7]**

b) Explain methodologies of proteomics. **[5]**

Q3) a) Explain initiation of protein synthesis in prokaryotes. **[7]**

b) Justify DNA is the genetic material. **[5]**

Q4) a) Describe the enzymology of DNA replication. **[7]**

b) Explain maxam-Gilbert sequensing method. **[5]**

P.T.O.

Q5) a) Describe the process of pre-mRNA Splicing. **[7]**

b) Explain transposons mediated gene tagging. **[5]**

Q6) a) Describe the double helix model of DNA. **[7]**

b) Explain protein targetting. **[5]**

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

a) Base excision repair.

b) Northern blotting.

c) Attenuation at trp operon.

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Total No. of Questions : 7]

SEAT No. :

PA-3324

[Total No. of Pages : 2

[5915]-23

M.Sc.-I

BOTANY

BOUT-123 : Biochemistry

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

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

Instructions to the candidates:

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

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

a) Define competitive and non-competitive in hibitors.

b) What is Ramchandran plot?

c) Give Functions of myoglobin.

d) What are nif genes?

e) Give properties of polysaccharides

f) What are secondary metabolites.

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

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

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

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

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

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

P.T.O.

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

b) Describe factors affecting enzyme activity. **[5]**

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

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

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

a) Ionization of water.

b) Nitrate and ammonium assimilation.

c) Extraction method for alkaloids.

Total No. of Questions : 5]

SEAT No. :

PA-3325

[Total No. of Pages :2

[5915]-24
M.Sc. - I
BOTANY
BODT - 124 A : Floriculture and Nursery Management
(CBCS 2019 Pattern) (Semester - II)

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

Instructions to the candidates:

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

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

a) Enlist any four varieties of Gerbera.

b) What is surface dressing in nureseries.

c) Give the names of expensive flowers of the world.

d) Enlist the methods of seed germination.

e) What is ideal temperature for growing Anthurium.

f) Give different types of nurseries.

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

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

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

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

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

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

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

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

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

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

P.T.O.

Total No. of Questions : 5]

PA-3325

[5915]-24
M.Sc.
BOTANY
BODT - 124 B : Mushroom Cultivation & Biopesticide Technology
(CBCS 2019 Pattern) (Semester - II)

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

Instructions to the candidates:

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

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

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

Q2) a) Describe the steps involved in cultivation of Button mushroom. **[6]**
b) Give an account of commerlization of biopesticides. **[4]**

Q3) a) Explain the role of crop rotation and organic amendments in bio control mechanism. **[6]**
b) Give any four nutritional values of mushrooms. **[4]**

Q4) a) Discuss the role of mycoherbicides and mycoweedicides as biocontrol agents. **[6]**
b) Give an account of present status of mushroom cultivation in India. **[4]**

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

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

Total No. of Questions : 7]

SEAT No. :

PA-3326

[Total No. of Pages : 2

[5915]-31

M.Sc. - II

BOTANY

BOUT - 231 : Computational Botany

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

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

Instructions to the candidates:

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

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

a) Define standard deviation.

b) What is Bioinformatics?

c) What do you mean by mole and molarity.

d) Calculate the median from following data

9, 11, 12, 10, 11, 15, 11, 13, 12, 14

e) The percentage of water, lipid, protein and other minerals are 66.35%, 6.66%, 5.2%, 21.79% respectively in body of species of fish. Draw a pie chart with the help of the given data.

f) What is a sampling?

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

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

P.T.O.

Q3) a) Explain Mann-Whitney U test. **[7]**

b) In a grassland community the lichen population was sampled from 10 randomly located plots of 1m square area. The following table given the no. of lichen obtained. Find out the Chi-square value. **[5]**

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

Q4) a) Describe the process of patent submission. **[7]**

b) The length and width of 7 group of plant of species are given below find out Karl Pearson coefficient of correlation of the two variable. **[5]**

Length(cm) :	11.7	13.9	15.5	17.8	18.5	19.2	22
Width(cm) :	7.10	12.42	15.35	23.20	28.45	32.25	39.84

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

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

Wt.when brought :	49	41	37	41	42	37	39	38	41	35
Wt. after six month :	52	43	46	52	46	38	42	40	42	38

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

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

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

a) Random and non-random sampling.

b) Spearman's rank.

c) Hypergeometric distribution.

Total No. of Questions : 7]

SEAT No. :

PA-3327

[Total No. of Pages : 2

[5915]-32

M.Sc.

BOTANY - II

BOUT - 232 : Developmental Botany

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

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

Instructions to the candidates:

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

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

a) Define commitment.

b) Define differentiation.

c) What is photomorphogenesis?

d) What is potency?

e) What is cell fate?

f) Define Juvenility.

Q2) a) Discuss about Extrinsic factors affecting plant development. **[7]**

b) Explain the process of redifferentiation with suitable example. **[5]**

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

b) Explain the organization of RAM with suitable diagram. **[5]**

P.T.O.

Q4) a) Define stem cells. Describe their types. Add a note on role of stem cells in developmental Botany. **[7]**

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

Q5) a) Explain adventive embryogeny with neat labelled diagram. **[7]**

b) What is Senescence? Describe any two patterns of Senescence. **[5]**

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

b) Describe male germ unit with suitable diagram. **[5]**

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

a) Mutants in development.

b) Significance of Double fertilization.

c) Photoreceptors.

Total No. of Questions : 7]

SEAT No. :

PA-3328

[Total No. of Pages : 2

[5915]-33

M.Sc.

BOTANY - II

BOUT - 233 : Plant Physiology

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

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

Instructions to the candidates:

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

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

a) What is active transport?

b) Sketch and label structure of stomata.

c) Define photorespiration.

d) Which is primary electron acceptor in PS-I?

e) Give any two functions of lipids.

f) Give definition of glycolysis.

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

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

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

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

P.T.O.

Q4) a) Explain events in glycolysis. Add a note on significance of respiration. **[7]**

b) Write a short note on growth and its phases. **[5]**

Q5) a) Comment on CO_2 fixation in C_4 Cycle. Add a note on Kranz anatomy. **[7]**

b) Comment on source - Sink relationship. **[5]**

Q6) a) Define seed dormancy. Add a note on methods of breaking seed dormancy. **[7]**

b) Balance sheet of ATP generation in respiration. **[5]**

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

a) Significance of respiration.

b) C_4 photosynthesis in single cell.

c) Water conservation strategies of plants.

Total No. Of Questions : 5]

SEAT No. : ____

PA-3329

[Total No. Of Pages : 2

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

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

Instructions to the candidates :

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

Q1) **Solve <u>any Five</u> of the following** : **[5]**

a) Define Mycology.

b) Enlist classes of myxomycota.

c) What is coenocytic hyphae?

d) Define imperfect fungi.

e) Write any two classes of Ascomycota.

f) What are parasitic fungi?

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

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

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

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

P.T.O.

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

b) Comment on fungal growth. **[4]**

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

a) Sexual spores in Basidiomycetes.

b) Heterothallism

c) Asexual reproduction Ascomycota.

Total No. Of Questions : 5]

SEAT No. :

PA-3330

[Total No. Of Pages : 2

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

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

Instructions to the candidates :

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

Q1) **Solve <u>any Five</u> of the following** : **[5]**

a) Define Serology.

b) Comment on SEM.

c) Give any two morphological features used in identification.

d) What are "Floras"?

e) Write full form of IUCN.

f) Give any two functions of BSI.

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

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

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

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

P.T.O.

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

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

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

a) Ultrastructural Systematics and its role.

b) Endemism and hotspots of India.

c) Biodiversity conservation

Total No. Of Questions : 5]

SEAT No. :

PA-3331

[Total No. Of Pages : 2

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

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

Instructions to the candidates :

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

Q1) **Solve <u>any Five</u> of the following** : **[5]**

a) What is Symbiosis?

b) Explain Homeostasis.

c) Define Synecology.

d) Enlist any two characteristics of population.

e) What is ecotone?

f) Enlist types of ecosystem.

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

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

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

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

P.T.O.

Q4) a) Describe structure/stratification of community. **[6]**

b) Give a short note on food chain. **[4]**

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

a) Write a short note on Herbivory

b) Add a note on pollination.

c) Give an account of terresterial ecosystem.

Total No. Of Questions : 5]

SEAT No. :

PA-3332

[Total No. Of Pages : 2

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

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

Instructions to the candidates :

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

Q1) **Solve <u>any Five</u> of the following** : **[5]**

a) Define promotor.

b) What is tissue culture.

c) What is vector

d) Define somatic Hybridization.

e) Define Biosafety

f) What is patent.

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

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

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

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

P.T.O.

Q4) a) What is transgenic plant? Describe structure of Ti plasmid. **[6]**

b) Give Biosafety guideline in India **[4]**

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

a) Intellectual property rights.

b) Cybrid

c) Risk assessment in Research Laboratory.

Total No. Of Questions : 5]

SEAT No. :

PA-3333

[Total No. Of Pages : 2

[5915]-38
M.Sc.(Botany)
BODT-234 E: Genetics & Plant Breeding
(CBCS) (2019 Pattern) (Semester-III)

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

Instructions to the candidates :

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

Q1) **Solve <u>any Five</u> of the following** : **[5]**

a) Define Karyotype.

b) What are IS elements?

c) State Hardy-Weinderg principle.

d) Write any two factors influencing MAS

e) Define genetic diversity.

f) Define DUS.

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

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

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

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

P.T.O.

Q4) a) Discuss on Synder's ratio, their importance & effects over random mating. **[6]**

b) Write applications of Karyotyping. **[4]**

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

a) B - Chromosome & accessory chromosome.

b) Effect of Salinity Stress on plants.

c) Correlation - Coefficient analysis.

Total No. Of Questions : 5]

SEAT No. :

PA-3334

[Total No. Of Pages : 2

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

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

Instructions to the candidates :

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

Q1) **Solve <u>any Five</u> of the following** : **[5]**

a) What is seed Technology?

b) Define recalcitrant seeds.

c) What is seed viability?

d) What is a phenol colour test?

e) What is the full form of ELISA?

f) Define gametocides.

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

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

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

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

P.T.O.

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

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

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

a) Artificial seed production.

b) Male sterility

c) Types of seed samples.

Total No. of Questions : 7]

SEAT No. :

PA-3335

[Total No. of Pages : 2

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

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

Instructions to the candidates:

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

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

a) What is dispersion of Light?

b) Enumerate various adsorbants.

c) What is ELISA.

d) Give principle of electrophoresis.

e) Give any two applications of spectroscopy.

f) What is Autoradiography?

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

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

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

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

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

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

P.T.O.

Q5) a) Comment on NCBI. **[7]**

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

Q6) a) Give significance of histochemical techniques. **[7]**

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

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

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

b) Write note on UV-VIS Spectroscopy.

c) SDS - PAGE.

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Total No. of Questions : 7]

SEAT No. : ____

PA-3336

[Total No. of Pages : 2

[5915]-42

M.Sc. (Botany - II)

BOUT 242 : ADVANCED PLANT ECOLOGY

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

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

Instructions to the candidates:

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

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

a) Environmental audit.

b) Mutualism.

c) Herbivory.

d) Biosensors.

e) Air pollution.

f) Define sustainability.

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

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

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

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

P.T.O.

Q4) a) What are bioindicators? Enlist plants used as bioindicators in pollution control. **[7]**

b) Discuss in details about environmental management plan. **[5]**

Q5) a) Define ecosystem. Describe desert ecosystem in details. **[7]**

b) Write note on resistance and resilience. **[5]**

Q6) a) Describe in details the process for reviewing EIA of developmental projects. **[7]**

b) Comment on ecology of Fresh water ecosystem. **[5]**

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

a) Levels of species diversity and its measurement.

b) Endangered and threatened flora of India.

c) Restoration of degraded water bodies.

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Total No. of Questions : 5]

SEAT No. :

PA-3337

[Total No. of Pages : 2

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

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

Instructions to the candidates :

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

Q1) **Solve <u>any Five</u> of the following** : **[5]**

a) What are smuts?

b) Define seed pathology.

c) Enlist types of mycorrhiza.

d) Name any two enzymes produced by fungi.

e) Enlist name of any two edible mushrooms.

f) What is superficial mycosis?

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

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

Q3) a) Describe cultivation of wheat straw mushroom <u>pleurotus</u>. **[6]**

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

P.T.O.

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

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

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

a) Myconematicides

b) Fungi as food

c) Food toxins.

Total No. of Questions : 5]

SEAT No. :

PA-3338

[Total No. of Pages : 2

[5915]-44

S.Y. M.Sc. (Botany)

BODT-243B: ADVANCED MEDICINAL BOTANY

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

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

Instructions to the candidates :

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

Q1) Solve any five of the following :

a) Define Pharmacognosy. **[1]**

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

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

d) Give any two macroscopic characters of Aloe Vera. **[1]**

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

f) Define pesticides **[1]**

Q2) Attempt the following :

a) Describe the process of morphological and microscopic drug evaluation. **[6]**

b) Write a note on marine drug. **[4]**

P.T.O.

Q3) Attempt the following :

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

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

Q4) Attempt the following :

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

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

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

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

b) Phytopharmaceutical aspects of medicinal plants. **[5]**

c) Significance of natural excipients. **[5]**

Total No. of Questions : 5]

SEAT No. :

PA-3339

[Total No. of Pages : 2

[5915]-45

S.Y. M.Sc. (Botany)

BODT-243C: ADVANCED PLANT PHYSIOLOGY

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

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

Instructions to the candidates :

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

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

a) Name the fruit ripening harmone.

b) Give any two methods of storage of cut flowers.

c) What is anoxia?

d) What is CO_2 compensation point?

e) Define photosystem? Give its types.

f) What is respiration?

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

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

Q3) a) Describe in detail regulation of C_3 photosynthesis. **[6]**

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

P.T.O.

Q4) a) Give an account of C_3-C_4 intermediate pathway. **[6]**

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

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

a) CO_2 response curve.

b) CAM in desert plants.

c) Chemical changes during fruit ripening.

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Total No. of Questions : 5]

SEAT No. :

PA-3340

[Total No. of Pages : 2

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

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

Instructions to the candidates:

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

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

a) Define Bioplastic.

b) Give two examples of fermented dairy product.

c) What is bioleaching?

d) Write names of two amino acids produced by fermentation process.

e) What is Biofiltration?

f) Write any two fermented feed products.

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

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

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

b) Explain process of β-carotene production. **[4]**

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

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

P.T.O.

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

a) Primary metabolites

b) Nanocatalysis

c) Toxins

Total No. of Questions : 5]

SEAT No. :

PA-3341

[Total No. of Pages : 2

[5915]-47
S.Y. M.Sc.
BOTANY
BODT-243E : Seed Technology
(2019 Pattern) (Semester - IV)

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

Instructions to the candidates:

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

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

a) Define seed technology.

b) Define seed entomology.

c) What is seed deterioration?

d) Who appoint the qualified person as a seed inspector?

e) What is seed quarantine?

f) Define seed storage.

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

b) Explain seed health methods. **[4]**

Q3) a) Explain about integrated management of seed borne diseases. **[6]**

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

P.T.O.

Q4) a) Give the detailed account of seed inspector, its power and duties. **[6]**

b) Explain the relation between the insect and plant. **[4]**

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

a) Causes of seed deterioration

b) Indian seed legislation

c) Handling of seeds; conveyor and Elevators

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Total No. of Questions : 5]

SEAT No. :

PA-3342

[Total No. of Pages : 2

[5915]-48

M.Sc.

BOTANY (Part - II)

BODT-244 : Plant Tissue Culture Technology

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

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

Instructions to the candidates:

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

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

a) What is Biotransformation?

b) Define re-differentiation.

c) Enlist any two environmental factors affecting plant tissue culture.

d) What is electroporation?

e) Enlist the growth regulators used in plant tissue culture.

f) Define totipotency of the plant cell.

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

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

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

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

P.T.O.

Q4) a) What is germplasm? Write note on Ex-situ conservation of germplasm. **[6]**

b) Describe the mechanism of integration of DNA into plant genomes. **[4]**

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

a) Somaclonal variation.

b) Agrobacterium mediated gene transfer to plants.

c) Protoplast Culture.

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Total No. of Questions : 5]

SEAT No. :

PA-3343

[Total No. of Pages : 2

[5915]-49
M.Sc. - II
BOTANY
BODT 244 : Herbal Technology
(2019 Pattern) (CBCS) (Semester - IV)

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

Instructions to the candidates:

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

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

a) Define Herbal Technology.

b) What is Probiotics?

c) Give Longform of WHO.

d) Define Bioprospecting.

e) Write in short on churna.

f) Enlist any 2 names of herbal raw material.

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

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

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

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

P.T.O.

Q4) a) What is Patent? Give patenting aspects of traditional knowledge. **[6]**

b) Give an account of medicinal plants as a source of tannins and phenolics. **[4]**

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

a) Write on stability testing of herbal drugs.

b) Give concept and need of packaging of herbal products.

c) Write a short note on Herbal cosmetics.

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Total No. of Questions : 5]

SEAT No. :

PA-3344

[Total No. of Pages : 2

[5915]-50
M.Sc.
BOTANY - II
BODT 244 C : Research Methodology
(2019 Pattern) (CBCS) (Semester - IV)

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

Instructions to the candidates:

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

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

a) What is plagiarism.

b) Enlist different types of research method.

c) What is fundamental research.

d) Define Histogram.

e) What is meant by citations.

f) Enlist the name of model organisms used in the research of genetics.

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

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

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

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

P.T.O.

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

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

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

a) Concept and sources of literature review.

b) Importance of fundamental research.

c) Importance of reproducibility in scientific research.

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