Total No. of Questions : 4]

SEAT No. :

PC4251

[Total No. of Pages : 2

[6342]-1001

First Year M.Sc.

BOTANY

BOT 501 MJ : Plant Taxonomy -I (Algae and Fungi)

(2023 Credit Pattern) (Semester - I)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat labelled diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) Answer the following questions. **[5]**

a) What is plasmodium?

b) Give any two uses of lichens.

c) Write full form of ICN.

d) Define Neutra Ceuticals.

e) What is Phycology?

Q2) a) Explain in brief any one of the following. **[6]**

i) Define Mycorrnizae & Explain the types of mycorrhizae.

ii) Explain the fungal databases and its uses.

b) Describe any one of the following. **[4]**

i) Describe the thallus organization and life cycle of phaeophyta.

ii) Explain the role of algae in various industries and comment on its applications.

P.T.O.

Q3) a) Explain in brief any one of the following. **[6]**

i) Explain classification of algae given by chapman and chapman in Detail.

ii) Describe cell structure and reproduction in euglenophyta.

b) Describe any one of the following. **[4]**

i) Write the key for identification of lichenized fungi.

ii) What is seaweed & explain application in marine algal farming.

Q4) Write notes on any four of the following. **[10]**

a) Economic importances of Blue Green Algae

b) Bioremediation

c) Algal toxin

d) Methods of reproduction in Deuteromycetes

e) Applications of fungi

f) Methods of preparation of artificial keys in fungi?

■■■■

Total No. of Questions : 4]

SEAT No. : ____

PC-4252

[Total No. of Pages : 2

[6342] - 1002
M.Sc. (Part-I)
BOTANY
BOT-502 MJ: Plant Taxonomy - II (Bryophytes and Ptendphyles)
(2023 Credit Pattern) (Semester - I) (NEP 2020)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat labelled diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) **Answer the following questions :** **[5]**

a) What is Protostele?

b) Write the arrangement of leaves in Selaginella.

c) Which is the dominant phase in life cycle of bryophytes?

d) What are bryophytes?

e) Write any two economic importance of bryophytes.

Q2) **a) Explain in brief any one of the following :** **[6]**

i) Describe the structure of sporophyte in Anthoceros

ii) Give morphological characters of Porella.

b) Describe any one of the following : **[4]**

i) Enlist distinguishing features of class sphenopsida

ii) Describe the T.S. of leaflet in Pteris

P.T.O.

Q3) **a) Explain in brief <u>any one</u> of the following :** **[6]**

i) Give an outline of classification of pteridophytes by sporne

ii) Describe the T.S. of <u>Psilotum</u> stem with neat & labelled diagram

b) Describe <u>any one</u> of the following : **[4]**

i) Give affinities of thallophytes with bryophytes

ii) Describe T.S. of thallus of <u>Plagiochasma</u>

Q4) **Write notes on <u>any four</u> of the following :** **[10]**

a) Rhizoids and scales in bryophytes

b) Adaptations of bryophytes to Land habit

c) Reproduction in bryophytes

d) <u>Equisetum</u> cone

e) General characters of lycopsida

f) Sporophyte of <u>Pteris</u>

Total No. of Questions : 4]

SEAT No. :

PC4253

[Total No. of Pages : 2

[6342]-1003
M.Sc. - I
BOTANY
BOT-503 MJ : Plant Physiology
(2023 Credit Pattern) (Semester - I)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat labelled diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) Answer the following questions. **[5]**

a) What is mean by Light Reaction?

b) Enlist any two plant Pigments.

c) What is the role of Alternative Oxidase in Electron transport chain?

d) What is Abiotic stress?

e) Define susceptibility.

Q2) a) Explain in brief any one of the following. **[6]**

i) Explain the Mechanism of Light harvesting complex.

ii) Explain the Pentose Phosphate pathway.

b) Describe any one of the following. **[4]**

i) Describe the Biosyntetic Pathway of Polyamines.

ii) Describe the structure and function of Phytochromes.

Q3) a) Explain in brief any one of the following. **[6]**

i) Explain the Process of phloem unloading.

ii) Explain the response of plant against Drought stress.

b) Describe any one of the following. **[4]**

i) Describe Kautsky curve.

ii) Describe in details Cyanide Resistance pathway.

P.T.O.

Q4) Write notes on any four of the following. **[10]**

a) C4 Pathway.

b) Cyclic Photophosphorylation.

c) Gluconeogenesis.

d) Catabolism of Polyamines

e) Phototropin mediated signalling transduction.

f) Physiological importance of Brassinosteroids.

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Total No. of Questions : 4]

SEAT No. : ____

PC-4254

[Total No. of Pages : 2

[6342] - 1004
M.Sc. (Part-I)
BOTANY
BOT-504 MJ: Plant Biochemistry
(2023 Credit Pattern) (Semester - I) (NEP 2020)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat labelled diagrams must be drawm wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) **Answer the following questions :** **[5]**

a) What is PPM?

b) Define POH.

c) What are Motif and Fold?

d) Define abzymes.

e) What are primary metabolites?

Q2) **a) Explain in brief <u>any one</u> of the following :** **[6]**

i) Henderson - Hasselbalch equation and give its significance.

ii) Biosynthesis of Phenols. Add note on their role in plants.

b) Describe <u>any one</u> of the following : **[4]**

i) Hydropathy plot.

ii) Transamination.

P.T.O.

Q3) **a) Explain in brief <u>any one</u> of the following :** **[6]**

i) Biosynthesis of amino acids with reference to GS and GOGAT in plants.

ii) Structure of Haemoglobin. Add note on its function.

b) Describe <u>any one</u> of the following : **[4]**

i) Beta - oxidation of fatty acids.

ii) Nucleotide synthesis.

Q4) **Write notes on <u>any four</u> of the following :** **[10]**

a) Buffers in biological system.

b) Alpha - oxidation

c) Properties of amino acids

d) Ribozymes

e) Reductive amination.

f) Nucleotide degradation

Total No. of Questions : 4]

SEAT No. : ____

PC4255

[Total No. of Pages :2

[6342]-1005

M.Sc. (Part - I)

BOTANY

BOT - 505 MJ : Green Belt and Green Credit

(2023 Credit Pattern) (Semester- I)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat labelled diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) Answer the following questions. **[5]**

a) Name two plants which reduce water pollution.

b) What is waste?

c) What is Tree Census?

d) Give two examples of plants used for greenbelt.

e) Define plant Nursery.

Q2) a) Explain in brief any one of the following. **[6]**

i) Objectives and significance of Green belt.

ii) Features and ammendments of Maharashtra Tree Act 2016.

b) Describe any one of the following. **[4]**

i) Role of plants in reducing pollution.

ii) Importance of plant Nursery for Greenbelt.

Q3) a) Explain in brief any one of the following. **[6]**

i) Strategies and present status of Mangrove conservation.

ii) Explain the Green concept in waste management.

b) Describe any one of the following. **[4]**

i) What is green credit? Give its objectives.

ii) Importance of Ecomark.

P.T.O.

Q4) Write notes on any four of the following. **[10]**

a) Sustainable Agriculture based Green Credits

b) Goals of mitigation

c) Models of Greenbelt development

d) Sustainable Building and Infrastructure based Green Credits

e) Plant Nursery and its types

f) Green Credit program activities.

Total No. of Questions : 4]

SEAT No. : [ ]

PC4256

[Total No. of Pages : 2

[6342]-1006
M.Sc. - I
BOTANY
BOT-510 MJ: Landscape And Gardening
(2023 Credit Pattern) (Semester - I)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat labelled diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) Answer the following questions. **[5]**

a) Define landscape gardening.

b) What is computerized plan.

c) Enlist any two bulbous plants.

d) What is importance of fountains.

e) Enlist any two examples from shrubs.

Q2) a) Explain in brief any one of the following. **[6]**

i) Explain in brief the principle of utility and mobility in landscape gardening.

ii) Write about driveway as hard elements in landscape gardening.

b) Describe any one of the following. **[4]**

i) Write note on landscape designing.

ii) Explain in brief types of landscape designing process.

P.T.O.

Q3) a) Explain in brief any one of the following. **[6]**

i) Define landscape gardening. Explain in brief how maintainance practices are carried out in landscape gardening.

ii) Explain landscape done for hospitals and industries.

b) Describe any one of the following. **[4]**

i) Enlist and explain types of landscape gardening.

ii) Write note on soft elements in landscape gardening.

Q4) Write notes on any four of the following. **[10]**

a) Cactii in landscape .

b) History of landscape gardening.

c) Trees as soft element.

d) Landscape design for Institutes.

e) Basic landscape plan.

f) Irrigation system in landscape.

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Total No. of Questions : 4]

SEAT No. :

PC4257

[Total No. of Pages : 1

[6342]-1007

First Year M.Sc.

BOTANY

BOT -511 -MJ : Post Harvest Technology of Commercial Crops

(Credit 2023 Pattern) (Semester - I)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat labelled diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) Answer the following questions. **[5]**

a) Define Maturity Indices

b) What is modern packaging system.

c) Define canning.

d) Enlist two types of storage facilities.

e) Define quality control

Q2) a) Explain in brief any one of the following. **[6]**

i) Explain the methods of harvesting of different crops.

ii) Give an account on post harvest losses.

Q2) b) Describe any one of the following. **[4]**

i) Explain the handling technique to minimize physical Damage.

ii) Describe the methods for Assessing and maintaining product quality.

P.T.O.

Q3) a) Explain in brief any one of the following. **[6]**

i) Explain the requirements for an ideal package & their benefits?

ii) Explain packaging and branding for effective product presentation.

b) Describe any one of the following. **[4]**

i) Describe Any two methods of post harvest treatments.

ii) Describe the physical methods of identification of maturity.

Q4) Write notes on any four of the following. **[10]**

a) Nutritional value of any two Fruits.

b) Plant Growth Regulator with examples.

c) Value added processing options.

d) Transportation system.

e) Logistic Management.

f) Food laws & Regulation.

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Total No. of Questions : 4]

SEAT No. : [ ]

PC-4258

[Total No. of Pages : 2

[6342]-1008
M.Sc. (Part - I)
BOTANY
BOT - 512 MJ: Biodiversity Conservation and Utilization
(2023 Pattern) (Semester - I) (NEP 2020)

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

Instructions to the candidates :

1) ***All questions are compulsory.***
2) ***Neat labelled diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) Answer the following questions : **[5]**

a) What is Biodiversity?

b) Enlist the types of Biodiversity.

c) Enlist Biodiversity hotspots in India.

d) What is social approach for conservation.

e) Give full form of UNEP.

Q2) a) Explain in brief any one of the following : **[6]**

i) Phytogeographical regions of India.

ii) Bioresource processing and it end product.

b) Describe any one of the following : **[4]**

i) Biodiversity hotspots in India.

ii) Biodiversity Management.

P.T.O.

Q3) a) Explain in brief any one of the following : **[6]**

i) Methods of conservation.

ii) Use of plant Biodiversity.

b) Describe any one of the following : **[4]**

i) Chipko Movements.

ii) Intellectual Property Rights.

Q4) Write notes on any four of the following : **[10]**

a) Importance of Biodiversity.

b) Keystone species.

c) Ecosystem diversity.

d) Biodiversity Acts.

e) Participatory forest.

f) Need of Biodiversity Utilization.

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Total No. of Questions : 4]

SEAT No. :

PC-4259

[Total No. of Pages : 2

[6342]-1009

M.Sc. (Part - I)

BOTANY

BOT-513MJ : Integrated Pest Management

(2023 Credit Pattern) (NEP-2020) (Semester - I)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Neat labelled diagrams must be drawn wherever necessary.***

Q1) **Answer the following questions.** **[5]**

a) Write any two significance of IPM.

b) What is habitat manipulation?

c) What is biological control?

d) Write any two biotechnology applications in pest management.

e) Write any two methods of toxicity evaluation of pesticides.

Q2) a) **Explain in brief <u>any one</u> of the following :** **[6]**

i) Explain application techniques and safety precautions for fungicides.

ii) Describe ecological interactions between pests and host plants.

b) **Describe <u>any one</u> of the following :** **[4]**

i) Explain in brief designing and implementation of IPM programmes.

ii) How environmental impact assessment implemented in IPM?

P.T.O.

Q3) a) **Explain in brief <u>any one</u> of the following :** **[6]**

i) Explain global perspectives on IPM implementation.

ii) Write biotechnology applications in pest management.

b) **Describe <u>any one</u> of the following :** **[4]**

i) Describe the role of crop rotation and diversification in pest control.

ii) Explain different techniques in monitoring pest population.

Q4) Write notes on any four of the following. **[10]**

a) Integrated Pest Management (IPM)

b) Detection of Pest damage Symptoms.

c) Guiding principles of IPM

d) Decision making process in IPM.

e) Validation of IPM

f) Implementation strategies of IPM

Total No. of Questions : 4]

SEAT No. : ____

PC-4260

[Total No. of Pages : 2

[6342]-1010

M.Sc. (Part - I)

BOTANY

BOT - 514 MJ : Seed Science

(2023 Pattern) (Credit) (NEP 2020) (Semester - I)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat labelled diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicates full marks.***

Q1) **Answer the following questions.** **[5]**

a) Define-seed germination.

b) Enlist storage grain pest.

c) What is long form of GoT?

d) Enlist classes of seed.

e) What is seed pathology?

Q2) **a) Explain in brief <u>any one</u> of the following :** **[6]**

i) What are Seed? Give the 'Dift between' ordodox and Recalcitrant Seed.

ii) Explain seed legislation in India with statutory requirement for sale of seed.

b) Describe <u>any one</u> of the following : **[4]**

i) Explain integrated management of seed borne disease.

ii) Discuss - Seed Entomology.

P.T.O.

Q3) **a) Explain in brief <u>any one</u> of the following :** **[6]**

i) Explain - Parameters of seed testing quality.

ii) Discuss-Relation of Insect and pest on pulses & vegetables.

b) Describe <u>any one</u> of the following : **[4]**

i) Explain the objectives of Seed Technology.

ii) Explain types of seed germination.

Q4) **Write notes on <u>any four</u> of the following :** **[10]**

a) Seed Health

b) Moisture meter

c) Significance of seed transmission

d) Causes of seed dormancy

e) Penalties for offenders

f) Factors Affecting seed germination

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Total No. of Questions : 4]

SEAT No. :

PC4261

[Total No. of Pages : 2

[6342]-1011

First Year M.Sc.

BOTANY

BOT- 541 MN : Research Methodology in Plant Sciences

(2023 Credit Pattern) (Semester - I)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat labelled diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) Answer the following questions. **[5]**

a) Define hypothesis

b) What is likert scale?

c) State the meaning of secondary data.

d) Give any two functions of hypothesis.

e) What is research?

Q2) a) Explain in brief any one of the following. **[6]**

i) What is literature review? Explain in brief the difference between review and research paper.

ii) What are criterias of good research?

b) Describe any one of the following. **[4]**

i) Write a note on Chi-Square test.

ii) Write a note on ANNOVA.

P.T.O.

Q3) a) Explain in brief any one of the following. **[6]**

i) Explain the journal citation report (JCR) and journal impact factor (IF)

ii) What is interpretation? Explain the techniques of interpretation.

b) Describe any one of the following. **[4]**

i) Describe the techniques involved in defining research problems.

ii) Difference between conceptual and empirical research.

Q4) Write notes on any four of the following. **[10]**

a) Null hypothesis.

b) Intellectual property rights (IPR).

c) T-test.

d) Reference management using Mendeley.

e) Methods of interview.

f) Functions of hypothesis.

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Total No. of Questions : 4]

SEAT No. : ____

PC-4262

[Total No. of Pages : 2

[6342]-2001

M.Sc.(Part - I)

BOTANY

BOT - 551MJ : PLANT TAXONOMY - III

(2023 Pattern) (Semester - II)

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

Instructions to the candidates :

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Neat labelled diagrams must be drawn wherever necessary.***

Q1) **Answer the following questions.** **[5]**

a) What is Geological times scale?

b) Give the features of Nipaniophyllum.

c) Write any two characters of class psilopsida.

d) Write any two salient features of order cordaitales.

e) Characteristic features of Glassopteris.

Q2) **a) Atttemept any one of the foloowing.** **[6]**

i) Describe external and internal morphology of Rhynia with neat labelled daigram.

ii) Explain external and internal features of Lepidodendron with neat labelled diagram.

b) Attempt any one of the following. **[4]**

i) What is Fossils? Explain the process of fossil formation in detail.

ii) Write about salient features of order Bennettitales.

P.T.O.

Q3) **a) Attempt <u>any one</u> of the following.** **[6]**

i) Describe the anatomy and secondary growth of stem of <u>Ginkgo.</u>

ii) Describe the leaf anatomy of <u>Ephedra</u> with neat labelled diagram.

b) Attempt <u>any one</u> of the following. **[4]**

i) Write about affinites of gymnosperms with angiosperms.

ii) Explain the external morphology of order cycadeodales with suitable diagram.

Q4) Write notes on <u>any four</u> of the following. **[10]**

a) From genera conept.

b) Petrifaction

c) <u>Lyginopteris oldhamia</u>

d) Economic aspects of gymnosperms.

e) <u>Zamia.</u>

f) <u>Pentoxylon.</u>

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Total No. of Questions : 4]

SEAT No. : [ ]

PC4263

[Total No. of Pages : 2

[6342]-2002

M.Sc. - I

BOTANY

BOT-552-MJ : Taxonomy of Angiosperms

(2023 Credit Pattern) (Semester - II)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat labelled diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) Answer the following questions. **[5]**

a) Define taxonomy.

b) What is nomenclature?

c) What is isotype?

d) Enlist two characters of Family poaceae.

e) Give two merits of artificial system of classification.

Q2) a) Attempt any one of the following : **[6]**

i) Give outline of APG IV.

ii) Discuss various phases of taxonomy.

b) Attempt any one of the following : **[4]**

i) Define species concept and comment on evolutionary species concept.

ii) Merits and limitations of Bentham and Hooker's system of classification.

P.T.O.

Q3) a) Attempt <u>any one</u> of the following : **[6]**

i) Give general characters and systematic position of Family Aeiaceae.

ii) Give diagnostic characters and economic importance of family Bignoniaceae.

b) Attempt <u>any one</u> of the following : **[4]**

i) Give economic importance of Family Arecaceae.

ii) Give systematic position with reasons of Family Verbenaceae.

Q4) Write notes on any four of the following : **[10]**

a) Contributions of E.K. Janaki Ammal.

b) Alpha taxonomy.

c) Give any one recommendation of ICN.

d) Morphological variation in Family Orchidaceae.

e) Characters of family Dipterocarpaceae.

f) Economic uses of Family Asteraceae.

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Total No. of Questions : 4]

SEAT No. : ____

PC-4264

[Total No. of Pages : 2

[6342]-2003

M.Sc.(Part - I)

BOTANY

BOT - 553 MJ : Cytogenetics and Plant Breeding

(2023 Pattern) (Semester - II)

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

Instructions to the candidates :

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Neat labelled diagrams must be drawn wherever necessary.***

Q1) **Answer the following questions :** **[5]**

a) Define cytogenetics.

b) What is karyotype?

c) Write any two objectives of Plant breeding.

d) Define Mass selection.

e) Enlist types of mutations.

Q2) **a) Atttemept any <u>one</u> of the following :** **[6]**

i) Explain three-point test cross with suitable example.

ii) What is crossingover? Give cytological consequences of crossingover in inversion and translocation heterozygotes.

b) Attempt any <u>one</u> of the following : **[4]**

i) Explain the types of aneuploidy.

ii) Give structure and organization of Chromosome.

P.T.O.

Q3) **a) Attempt any <u>one</u> of the following :** **[6]**

i) What is clonal selection? Give procedure, advantages and disadvantages of clonal selection.

ii) What is hybridization? Give procedure and difficulties in hybridization.

b) Attempt any <u>one</u> of the following : **[4]**

i) Give advantages, disadvantages and achievements of mass selection.

ii) Explain types of male sterility and their uses in hybrid seed production.

Q4) Write notes on any <u>four</u> of the following : **[10]**

a) Applications of cytogenetics.

b) Causes of mutations.

c) Autopolyploidy.

d) Scope of plant breeding.

e) Advantages and disadvantage of pureline selection.

f) Genetic basis of heterosis.

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Total No. of Questions : 4]

SEAT No. : [ ]

PC4265

[Total No. of Pages : 2

[6342]-2004

M.Sc. - I

BOTANY

BOT - 554 MJ : Molecular Biology

(2023 Credit Pattern) (Semester - II)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat labelled diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) Answer the following questions. **[5]**

a) Exo - nuclease what is exonuclease?

b) Write the role of sigma factor

c) Write about Exon.

d) Define translation

e) Give the role of RNA connector

Q2) a) Attempt any one of the following. **[6]**

i) Describe DNA replication mechanism with the help of suitable diagram in prokaryotes.

ii) Explain DNA packaging in prokaryotic organisms with suitable diagram.

b) Attempt any one of the following. **[4]**

i) Write on structure of eukaryotic DNA polymerase.

ii) Describe the mechanism of base excision repair.

P.T.O.

Q3) a) Attempt any one of the following. **[6]**

i) Explain mRNA processing in eukaryotes.

ii) Describe Tryptophan Operon with neat labelled diagram.

b) Attempt any one of the following. **[4]**

i) Explain ribosomal assembly.

ii) Describe negative gene regulation with suitable example.

Q4) Write notes on any four of the following. **[10]**

a) Endo - nuclease

b) Leading and lagging strand

c) Causes of DNA damages

d) r-RNA

e) RNA polymerase

f) Importance of gene regulation

Total No. of Questions : 4]

SEAT No. : ____

PC-4266

[Total No. of Pages : 2

[6342] - 2005
M.Sc. (Part-I)
BOTANY
BOT-555 MJ: Pharmacognosy
(2023 Credit Pattern) (Semester - II) (NEP 2020)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat labelled diagrams must be drawm wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) **Answer the following questions :** **[5]**

a) What is Pharmacognosy?

b) Write the full form of TLC.

c) Give the definition of ethnobotany.

d) Mention any two roles of Ethno- pharmacology.

e) Name any two medicinal plants.

Q2) **a) Attempt <u>any one</u> of the following :** **[6]**

i) Explain the role of chromatographic methods in purification of extracts of crude drugs.

ii) Describe the exogenous and endogenous factors affecting the cultivation of medicinal plants

P.T.O.

b) Attempt <u>any one</u> of the following : **[4]**

i) What is adulteration? Give reasons and causes of adulteration.

ii) Write about different evaluation methods of adulteration of crude drugs.

Q3) **a) Attempt <u>any one</u> of the following :** **[6]**

i) Write source, macroscopic characters and applications of Digitalis purpurea.

ii) Explain the chemical nature & characteristic features of flavonoids.

b) Attempt any one of the following : **[4]**

i) Write the medicinal and health benefits of alkaloids.

ii) Give the applications of Isabgol - Plantago <u>ovata</u>.

Q4) **Write short notes on <u>any four</u> of the following :** **[10]**

a) Give any 5 applications of pharmacognosy.

b) Microbial contamination in herbal drugs.

c) Role of soil and soil fertility in cultivation of medicinal plants.

d) Saponins

e) Limonoids

f) Reverse pharmacology

Total No. of Questions : 4]

SEAT No. :

PC4267

[Total No. of Pages : 2

[6342]-2006

M.Sc. - I

BOTANY

BOT-560 MJ : Hydroponics Technology

(2023 Credit Pattern) (Semester-II)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neal labelled diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) Answer the following questions. **[5]**

a) Define hydroponics

b) Give any two deficiency symptoms of phosphorus.

c) Give any two role of government in promotion of hydroponics entrepreneurship.

d) Give names of any two media used in hydroponics.

e) Enlist any two criteria for grading of hydroponics produce.

Q2) a) Attempt any one of the following. **[6]**

i) Describe financial and policy challenges in hydroponics entrepreneurship.

ii) Explain in detail effect of environmental factors on hydroponics plants.

b) Attempt any one of the following. **[4]**

i) Describe the significance of hydroponics entrepreneurship.

ii) Explain in brief history and origin of soil less culture.

P.T.O.

Q3) a) Attempt any one of the following. **[6]**

i) Explain Ex-clay & rock wool as medium for hydroponics.

ii) Describe formulation and monitoring of nutrient solutions in hydroponics.

b) Attempt any one of the following. **[4]**

i) Describe in brief continous flow solution culture in hydroponics.

ii) Explain in detail protocol for spinach cultivation through raft system.

Q4) Write notes on any four of the following. **[10]**

a) Global hydroponics market

b) Passive sub-irrigation

c) Vermiculite

d) Effect of EC & TDS on plant grown in hydroponics.

e) Role of micronutrients in hydroponics.

f) Applications of hydroponics.

Total No. of Questions : 4]

SEAT No. :

PC4268

[Total No. of Pages : 2

[6342]-2007

M.Sc. - I

BOTANY

BOT-561 MJ : Post Harvest Management of NTFPS

(2023 Credit Pattern) (Semester-II)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neal labelled diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) Answer the following questions. **[5]**

a) What is mean by Post-Harvest Management?

b) Enlist any two uses of Bamboo.

c) Give difference between Resin & Oleoresins.

d) Enlist any two methds of essential oil extraction.

e) Give the uses of Tannin.

Q2) a) Attempt any one of the following. **[6]**

i) What are NTFPS? Give the distribution & importance in the marketing.

ii) What is Gum? Give it's classification and collection methods.

b) Attempt any one of the following. **[4]**

i) Comment on the primary processing of NTFPS.

ii) Comment on the collection methods of gum.

P.T.O.

Q3) a) Attempt any one of the following. **[6]**

i) Elaborate the phenomenone of oleoresin formation in plants.

ii) Give classification of Tannin.

b) Attempt any one of the following. **[4]**

i) Explain the process of fiber & flosses formation.

ii) Give the role of NTFPs in sustainable development.

Q4) Write notes on any four of the following. **[10]**

a) Extraction process of Katha

b) Importance of NTFPs

c) Cultivation process of Bamboo

d) Factors affecting gum formation

e) Classification of Tannins

f) Importance of IPRs

Total No. of Questions : 4]

SEAT No. : ____

PC-4269

[Total No. of Pages : 2

[6342]-2008

M.Sc. (Part - I)

BOTANY

BOT562MJ: PLANT RESOURCE MANAGEMENT AND GEOSPATIAL TECHNIQUE

(2023 Credit Pattern) (Semester - II) (NEP -2020)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat labelled diagram must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) **Answer the following questions.** **[5 × 1 = 5]**

a) What are centre of origin?

b) Write any two examples of plant resources.

c) What is sustainable development?

d) Write principle of remote sensing?

e) How is GPS used in surveying?

Q2) **a. Attempt <u>Any One</u> of the following:**

i) Explain about Gum. **[6]**

ii) Explain concept of ecological restration.

b. Attempt <u>Any One</u> of the following: **[4]**

i) Describe the Food & Folder.

ii) Explain role of international & national organization for the conservation of environment.

P.T.O.

Q3) **a. Attempt Any One of the following:** **[6]**

i) Explain in detail GIS techniques.

ii) Explain about Geo coding of sacred groove.

b. Attempt Any One of the following: **[4]**

i) Discuss the Image classification of remote sensing.

ii) Describe the Geo-spatial techniques use in various field.

Q4) **Write notes on Any Four of the following:** **[10]**

a) Spices

b) Phyforemidiation

c) Mapping in GIS

d) Application of GPS

e) Principles of Geo Spatial technique

f) Ex. situ conservation.

Total No. of Questions : 4]

SEAT No. :

PC-4270

[Total No. of Pages : 2

[6342] - 2009
M.Sc. (Part-I)
BOTANY
BOT-563 MJ: Plant Microbe Interactions
(2023 Credit Pattern) (Semester - II) (NEP 2020)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat labelled diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) **Answer the following questions :** **[5]**

a) Define endophytic Fungi

b) What is AM Fungi?

c) Enlist endophytic Bacteria

d) Give names of any two Nematodes

e) What is Biotrophs?

Q2) **a) Attempt <u>any one</u> of the following :** **[6]**

i) Explain early phase AMF symbiosis and give its significance.

ii) Give difference between root associative and endophytic bacteria, add note on growth promotion.

P.T.O.

b) Attempt <u>any one</u> of the following : **[4]**

i) Describe process of symbiotic nitrogen fixation.

ii) Discuss mechanism of Biocontrol activity of endophytic bacteria against plant pathogen.

Q3) **a) Attempt <u>any one</u> of the following :** **[6]**

i) Explain mechanism of stomatal Hijacking and cell wall damaging enzymes in bacterial pathogenesis in plants.

ii) Explain mechanism of plant fungi interaction with example.

b) Attempt <u>any one</u> of the following : **[4]**

i) Describe how quorum sensing contribute to plant pathogenesis.

ii) Explain concept of diet breath in insect herbivores and give its significance.

Q4) **Write notes on any four of the following :** **[10]**

a) Biological control measures

b) Plant lectins

c) Entomopathogenic fungi

d) Nematode

e) Nematode Pathogenesis

f) Growth promoting fungi

Total No. of Questions : 4]

SEAT No. : ____

PC-4271

[Total No. of Pages : 2

[6342]-2010

M.Sc. - I

BOTANY

BOT 564 MJ : SEED TECHNOLOGY

(2023 Pattern) (Semester - II) (NEP 2020)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat labelled diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) **Answer the following questions :** **[5]**

a) Write any two importances of seed technology.

b) Define male sterility.

c) What is seed samples?

d) Write any two objectives of seed certification.

e) Define seed treatment.

Q2) **a) Attempt <u>Any One</u> of the following :** **[6]**

i) Describe in detail general procedure of seed production.

ii) Give an account of powers and duties of seed inspector.

b) Attempt <u>Any One</u> of the following : **[4]**

i) Write a note on History of seed industry in India.

ii) Explain the objectives and role of national seed programme.

P.T.O.

Q3) **a) Attempt <u>Any One</u> of the following :** **[6]**

i) Explain different types of seed samples.

ii) Explain the objectives of seed processing.

b) Attempt <u>Any One</u> of the following : **[4]**

i) Give an account of staffing pattern of SCA.

ii) What are different types of seed treatment.

Q4) **Write notes on <u>Any Four</u> of the following :** **[10]**

a) Concept of seed technology.

b) Artificial pollination.

c) Observations during field inspection.

d) Mixing equipments for seed sampling.

e) Role of seed certification Agency.

f) Plant protection methods in seed production.

Total No. of Questions : 7]

SEAT No. : ____

PC-4272

[Total No. of Pages :2

[6342]-3001

M.Sc. Part - II

BOTANY

BOT 601A MJ: ADVANCED TAXONOMY OF ANGIOSPERMS - I

(2023 Credit Pattern) (Semester - III) (NEP 2020)

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) Scope of taxonomy.

b) Floras.

c) What is species radiation?

d) Molecular dating.

e) Polyphyly.

f) Merits of Takhatajan's system of classification.

Q2) a) Define taxonomy. Give its principles. **[5]**

b) Define speciation. Explain various isolating mechanisms. **[7]**

P.T.O.

Q3) a) Explain transitional-combinational theory. **[5]**

b) What is taxonomic literature? Discuss importance of herbarium and botanical gardens. **[7]**

Q4) a) Define cladistics. Discuss its principles. **[5]**

b) Give classification, distinguishing characters and economic importance of piperales. **[7]**

Q5) a) Economic importance of liliales. **[5]**

b) Explain homology and analogy giving examples. **[7]**

Q6) a) Give classification and distinguishing characters of commelinales. **[5]**

b) Outline of Takhtajans system of classification. **[7]**

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

a) Analytic versus synthetic characters.

b) Basal living angiosperms.

c) Economic importance of malvales.

Total No. of Questions : 7]

SEAT No. : ____

PC-4273

[Total No. of Pages :2

[6342]-3002

M.Sc. Part - II

BOTANY

BOT 601 B MJ: CYTOGENETICS AND PLANT BREEDING - I

(2023 Credit Pattern) (Semester - III) (NEP - 2020)

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 cytogenetics.

b) What is deletion?

c) What is paracentric inversion?

d) Define euploidy.

e) What is apomixis?

f) What is mass selection?

Q2) a) Describe various techniques used in cytogenetics. **[5]**

b) Explain crossing over in duplication heterozygotes. **[7]**

P.T.O.

Q3) a) Write process of artificial induction of translocation. **[5]**

b) Describe role of inversion in evaluation and karyotype reconstruction. **[7]**

Q4) a) Give characteristics of polyploids. **[5]**

b) Describe origin, production, morphology and uses of euploidy. **[7]**

Q5) a) Write detailed procedure of pedigree method. **[5]**

b) Give outline classification of apomixis and add a note on detection of apomixis. **[7]**

Q6) a) Define male sterility and explain its types. **[5]**

b) Explain detailed features of gametophytic and sporophytic self incompatibility. **[7]**

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

a) Explain merits and demerits of plant breeding.

b) Write merits and demerits of bulk method.

c) Write on objectives of back cross method.

Total No. of Questions : 7]

SEAT No. : ____

PC-4274

[Total No. of Pages : 2

[6342] - 3003
M.Sc. (Part-II)
BOTANY
BOT-601C MJ: Plant Physiology - I
(2023 Credit Pattern) (Semester - III) (NEP 2020)

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) ***Questions 2 to 7 carry equal marks.***
4) ***Neat labelled diagram must be drawn wherever necessary***
5) ***Figures to the right indicate full marks.***

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

a) Define entropy

b) What is ionization of water?

c) Enlist the pigments involved in photosynthesis.

d) What is the role of RuBP in photosynthesis.

e) Give the role of phytochromes

f) Give the role of florigen.

Q2) a) Describe the biosynthesis of gibberellins **[5]**

b) Explain the mechanism of nitrogen fixation in plant. **[7]**

Q3) a) Describe the role of membrane potential in ion transport. **[5]**

b) Enlist the enzyme complexes involved in ATP synthesis. Explain their role in detail. **[7]**

Q4) a) Describe the citric acid cycle. **[5]**

b) What are alkaloids? Give the classification of it with suitable examples. **[7]**

Q5) a) Physiological role of cytokinin. Explain in detail. **[5]**

b) Explain the relation between sink drawing ability (SDA) in seed growth and development. **[7]**

Q6) a) Describe the different developmental stages of seed. **[5]**

b) Enlist the ion transporters. Describe different types of ion transporters with their role **[7]**

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

a) Z - Scheme

b) Abscisic acid

c) Photoperiodism

Total No. of Questions : 7]

SEAT No. :

PC-4275

[Total No. of Pages : 2

[6342] - 3004
M.Sc. (Part-II)
BOTANY
BOT-601D MJ: Herbal Drug Technology - I
(2023 Credit Pattern) (NEP) (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) ***Questions 2 to 7 carry equal marks.***
4) ***Neat labelled diagram must be drawn wherever necessary.***
5) ***Figures to the right indicate full marks.***

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

a) Give the limitations of plant drug cultivation.

b) Write medicinal properties of turmeric.

c) Enlist the methods of purification of natural compounds.

d) Give any four applications of GCMS.

e) Enlist the measures of drug adulteration.

f) What do you mean by marine pharmacognosy?

Q2) a) Explain in detail HPLC method. **[5]**

b) Explain the biosynthesis and extraction of B- carotene. **[7]**

P.T.O.

Q3) a) Describe types of drug adulterations. **[5]**

b) Give an account of factors affecting cultivation of crude drugs. **[7]**

Q4) a) Write applications of LCMS. **[5]**

b) Describe super critical extraction method. **[7]**

Q5) a) Describe systematic cultivation method & post harvest technology of opium. **[5]**

b) Give an account of detection of pesticide residue and phytotoxins in adulterated drugs. **[7]**

Q6) a) Comment on types of extraction methods of natural compounds. **[5]**

b) Describe in detail biosynthesis and extraction method of alkaloids. **[7]**

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

a) Ex-situ conservation of crude drug plants.

b) General methods of purification & characterization of natural compounds.

c) Evaluation of natural drugs.

Total No. of Questions : 7]

SEAT No. :

PC-4276

[Total No. of Pages :2

[6342]-3005

M.Sc. (Part - II)

BOTANY

BOT - 601E MJ : SEED SCIENCE AND SEED TECHNOLOGY - I

(2023 Credit Pattern) (Semester - III) (NEP 2020)

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) Give any two characteristics of root system in wheat.

b) Which type of inflorescence present in cotton.

c) Enlist the factors affecting plant growth.

d) What is the ideal c (Carbon to Nitrogen) ratio for fertile soil.

e) Give the methods of weed management.

f) Define vegetable.

Q2) a) Describe the Procedure of pollination in hybrid seed production. **[5]**

b) Explain the specific requirements for producing okra seeds. **[7]**

P.T.O.

Q3) a) Explain the basic concept of organic farming. **[5]**

b) What types of quality tests are conducted during the evaluation of new variety. **[7]**

Q4) a) Describe the seed structure of sunflower. **[5]**

b) Explain the main diseases and pests that affect vegetable seed production. **[7]**

Q5) a) Classify vegetables based on growing season. **[5]**

b) Discuss the concept of biopesticides and their importance in sustainable agriculture. **[7]**

Q6) a) Describe factors considered during site selection for seed production. **[5]**

b) Explain biological control agent and their characteristics. **[7]**

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

a) Field standards in vegetable seed production.

b) primary morphological characters of Horse gram.

c) Role of soil in organic farming.

Total No. of Questions : 7]

SEAT No. : ____

PC-4277

[Total No. of Pages :2

[6342]-3006

M.Sc. (Part - II)

BOTANY

BOT 601F MJ : Applied Ecology & Environment - I

(2023 Pattern) (Semester - III)

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

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Attempt any five questions from Q.2 to Q.7.***
3) ***Questions 2 to 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 Ecosystem and give its component.

b) Give any two Economic effect of air pollutants.

c) Define Ecotone and give any two role of biological process in remedial measures of Ecotone.

d) Define pollution and give its type.

e) Write attributes of r-selected species.

f) What is succession?

Q2) a) Describe the concept of Restoration Ecology. **[5]**

b) Explain the effect of gaseas and particulate pollutants on animal & plant. **[7]**

P.T.O.

Q3) a) Explain the water pollution linked to human deseases. **[5]**

b) Described climax and stability of Ecosystem. **[7]**

Q4) a) What is biodiversity? Explain its types. **[5]**

b) What are Ecotone, role of biological process in remedial measures. **[7]**

Q5) a) Explain biogeochemical cycle? **[5]**

b) Discuss on protected areas sacread groves in India. **[7]**

Q6) a) Explain energy fixation and write their types. **[5]**

b) Explain Attributes of k-selected and r-selected species. **[7]**

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

a) Concept of Hotspots and Hotspot in India.

b) Role of plants in Air pollution mitigation.

c) Component of Ecosystem & Function.

Total No. of Questions : 7]

SEAT No. : ____

PC-4278

[Total No. of Pages : 2

[6342] - 3007
M.Sc. (Part-II)
BOTANY
BOT-601G MJ: Advanced Mycology and Plant Pathology - I
(2023 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) ***Questions 2 to 7 carry equal marks.***
4) ***Neat labelled diagram must be drawn wherever necessary.***
5) ***Figures to the right indicate full marks.***

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

a) What are sclerotia?

b) Name two sex organs found in fungi.

c) Name any two psychotolerant fungi.

d) What is Acervulus?

e) What is plasmodium?

f) Define plant pathology.

Q2) a) Explain sexual reproduction in fungi. **[5]**

b) Describe outline of fungal classification as per Alexopolus, Mims and Black well (1996) **[7]**

P.T.O.

Q3) a) Explain distinguishing characters of Myxomycotina. **[5]**

b) Describe life cycle pattern of chytridiomycetes. **[7]**

Q4) a) Explain life cycle pattern in Hemiascomycetes with suitable example. **[5]**

b) Discuss distinguishing. Characters of Ascomycotina. **[7]**

Q5) a) Describe role of fungal toxins in disease development. **[5]**

b) Discuss mechanism of genetic variation in pathogens. **[7]**

Q6) a) Explain role of environmental factors in disease development. **[5]**

b) Describe zoospore variation in Mastigomycotina. **[7]**

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

a) PR-Proteins

b) Thermotolerant and psychotolerant fungi

c) Conidial Ontogeny

Total No. of Questions : 7]

SEAT No. :

PC-4279

[Total No. of Pages :2

[6342]-3008

M.Sc. (Part - II)

BOTANY

BOT602MJ : Advanced Tools and Techniques in Plant Sciences

(2023 Pattern) (Semester - III) (NEP 2020)

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) Enlist various solvents used in chromatography.

b) Give principle of density gradient centrifugation.

c) Enlist reagents used in SDS-PAGE.

d) Define electric conductivity.

e) Write applications of Digital Herbarium.

f) Give applications of fluorescence properties.

Q2) a) Describe flow-cytometry. **[5]**

b) Highlight significance of soil sensors, give it's examples. **[7]**

P.T.O.

Q3) a) Describe circular dichromism spectro-scopy, give it's applications. **[5]**

b) Write principle, working and applications of confocal laser scanning microscopy (CLSM.) **[7]**

Q4) a) Comment on gas liquid chromatography. **[5]**

b) Describe mechanism of separation of biomolecules by any suitable electrophoresis tech. **[7]**

Q5) a) Explain various applications of cytological methods with suitable example. **[5]**

b) Explain microtomy technique give it's applications. **[7]**

Q6) a) Explain Lambert-Beers law. **[5]**

b) What is radioactivity, describe any one detection method. **[7]**

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

a) UHPLC

b) Use of radioisotopes in Biology

c) Mevalonic pathway

Total No. of Questions : 4]

SEAT No. : ____

PC4280

[Total No. of Pages : 2

[6342]-3009
M.Sc. - II
BOTANY
BOT-603 MJ: Intellectual Property Rights
(2023 Credit Pattern) (Semester - III)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat labelled diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) Answer the following questions. **[5]**

a) What is intellectual property right?

b) Define patent.

c) Define copyright.

d) Enlist any two benifits of plant breeders right.

e) What are disadvantages of plant breeders right?

Q2) a) Explain in brief any one of the following. **[6]**

i) Explain in detail requirement for filing of patent. Add a note on limits of patent.

ii) Describe in detail effect of registration and terms of protection of design.

b) Describe any one of the following. **[4]**

i) Explain scope of copyright protection.

ii) Write in detail on exclusive rights of the author.

Q3) a) Explain in brief any one of the following. **[6]**

i) Describe in detail International Union for the Protection of New Varieties of Plants Convention.

ii) Explain in detail farmers right under plant variety protection.

b) Describe any one of the following. **[4]**

i) Describe the process of obtaining plant breeders right.

ii) Explain best practices for managing IPR.

P.T.O.

Q4) Write notes on any four of the following. **[10]**

a) Licesing botanical innovations.

b) Implementation and mechanisms of ICBD.

c) Rights of trademark holder.

d) Characteristics of intellectual property.

e) Advantages of trademark licesing.

f) Application process for plant breeders right.

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Total No. of Questions : 4]

SEAT No. : ____

PC-4281

[Total No. of Pages :2

[6342]-3010

M.Sc. (Part - II)

BOTANY

BOT - 610 MJ : ADVANCED HORTICULTURAL TECHNIQUES

(NEP 2020) (2023 Credit Pattern) (Semester - III)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat labelled diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) **Answer the following questions:** **[5]**

a) Give any two importance of Horticulture.

b) What are Plant Growth Regulators (PGR)?

c) Define PPV and FR Act.

d) Define Aquaponics.

e) Intergrated Pest Management (IPM).

Q2) a) **Explain in brief <u>any one</u> of the following:** **[6]**

i) Plant quarantine, phyto-sanitory certification and detection of genetic constitution of germplasm.

ii) Automation technologies in horticulture.

b) **Describe <u>any one</u> of the following:** **[4]**

i) National and International importance of Horticulture.

ii) Canopy development and management.

P.T.O.

Q3) a) **Explain in brief <u>any one</u> of the following:** **[6]**

i) Harvesting and Post-harvest handling w.r.t. processing value addition storage.

ii) Principles of Budding and grafting.

b) **Describe any one of the following:** **[4]**

i) Basics of hydroponics system and their applications.

ii) Green house and polyhouse.

Q4) **Write notes on <u>any four</u> of the following:** **[10]**

a) Commercial varieties of regional importance in horticulture.

b) Direct organogenesis.

c) Factors affecting canopy development.

d) Breeder's rights.

e) Controlled Environment Agriculture (CEA).

f) Diagnostic tools for plant diseases.

Total No. of Questions : 4]

SEAT No. : ____

PC-4282

[Total No. of Pages : 2

[6342] - 3011
M.Sc. (Part-II)
BOTANY
BOT-611 MJ: Nursery and PTC Techniques
(2023 Credit Pattern) (Semester - III) (NEP 2020)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat labelled diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) **Answer the following questions :** **[5]**

a) Mention two types of nursery beds.

b) Define fertigation

c) Write about sales system for nursery.

d) What do you mean by genetic uniformity.

e) Define totipotency

Q2) **a) Explain in brief <u>any one</u> of the following :** **[6]**

i) Types of nurseries

ii) Nursery plant propagation by artificial propagation methods.

b) Describe <u>any one</u> of the following : **[4]**

i) Shooting and rooting in micropropagation.

ii) Embryo culture.

P.T.O.

Q3) **a) Explain in brief <u>any one</u> of the following :** **[6]**

i) Role of micronutrients in tissue culture media.

ii) Callus culture

b) Describe <u>any one</u> of the following : **[4]**

i) Growing media used in nursery.

ii) Economics of plant nursery.

Q4) **Write notes on <u>any four</u> of the following :** **[10]**

a) Tools used in P.T.C. laboratory

b) Nursery marketing.

c) Steps in media preparation for PTC.

d) Rapid multiplication of clones.

e) Sexual propagation of nursery plants.

f) Weeding in nursery.