SLR-ZD-1

Seat No.	

Set P

M.Sc. (Botany) (Sem - I) (New) (NEP CBCS) Examination: March/April - 2025
Biology & Diversity of Algae, Bryophytes, Pteridophytes and Fungi (2314101)

Day & Date: Thursday, 15-May-2025 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Multiple choice questions. **08**

1) ____ is one of the following is a colonial alga.
a) Ulothrix b) Spirogyra
c) Volvox d) Chlorella

2) ____ of the following contains chlorophyll a, d, phycoerythrin and phycocyanin.
a) Chlorophyta b) Phaeophyta
c) Rhodophyta d) Bacillariophyta

3) ____ among the following is also known as bog moss.
a) Riccia b) Sphagnum
c) Marchantia d) Funaria

4) All the plants like fern and mosses, which produce spores, are grouped under ____.
a) bryophytes b) cryptogams
c) thallophytes d) sporophytes

5) This group is used to represent pathological fungi ____.
a) Penicillium b) Truffles, mushrooms & morels
c) Smuts, rusts and moulds d) All of the above

6) In Pteridophytes, the dominant generation is ____.
a) Gametophytic b) Haploid
c) Diploid d) Triploid

7) Reduction division in pteridophytes occurs when ____.
a) Prothallus is formed b) Gametes are formed
c) spores are formed d) sex organs are formed

8) Sporophytic and gametophytic phases are independent in ____.
a) Bryophytes b) Pteridophytes
c) Phaeophytes d) Gymnosperms

B) Fill in the blanks <u>OR</u> Write true/false. **04**

a) Mannitol is a food reserve of Rhodophyceae. (True / False)
b) Ulothrix produces isogametes. (True / False)
c) In Ainsworth's system order Mucorales include under class ____.
d) In Ainsworth's system order Taphrinales include under class ____.

Q.2 Answer the following questions. (Any Six) **12**

a) Draw a neat labelled diagram of algal cell structure.
b) What is telome concept?
c) What is heterothallism?
d) What are the types of mode of nutrition in fungi?
e) Draw a neat labelled diagram of *Selaginella* stem T.S.
f) Enlist the economically important species of Bryophytes (any four spp.).
g) Enlist any four classes of algae.
h) Enlist the classes of Eumycota.

Q.3 Answer the following questions. (Any Three) **12**

a) Explain the general method of sexual reproduction in Bryophytes.
b) Enlist salient features of Sphagnales.
c) Comment upon cell wall composition of fungi.
d) Enlist salient features Sphenopsida.

Q.4 Answer the following questions. (Any Two) **12**

a) Explain telome concept and stelar evolution in Pteridophytes.
b) Explain in detail morphology & anatomy of *Selaginella.*
c) Explain the phylogenetic features of plasmodiophoromycetales.

Q.5 Answer the following questions. (Any Two) **12**

a) Explain in detail mode of nutrition in fungi.
b) Explain in detail reproduction (vegetative and sexual) methods in fungi.
c) Comment upon economic importance of Bryophytes.

Seat No.	

Set P

M.Sc. (Botany) (Sem - I) (New) (NEP CBCS) Examination: March/April - 2025
Taxonomy of Angiosperms (2314102)

Day & Date: Saturday, 17-May-2025 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative (MCQ). **08**

1) Red data list was formulated by ____.
a) ICBN b) IUCN
c) IUBN d) APG

2) *Ocimum* shows presence of ____ type of inflorescence.
a) Racemose b) Cymose
c) Verticillaster d) Umbel

3) A type made by author named as ____.
a) Holotype b) Isotype
c) Syntype d) Paratype

4) In taxonomy new species get represented by ____.
a) Spp. Alter b) Sp. Nova
c) Species name d) Specific genera

5) In citations names of two authors joined together by using ____.
a) emend b) ed
c) et d) and

6) ____ is one of the example of family sapotaceae.
a) *Crinum asiaticumb* b) *Tecoma starts*
c) *Ocimum sanctum* d) *Achrus zapota*

7) ____ is one of the ways of exsitu conservation.
a) Zoo b) Sanctuaries
c) National Park d) Seed banking

8) The spices which are on the verge of extinction are known as ____.
a) Endemic b) Rare
c) Extinct d) Endangered

B) Write True/False. **04**

a) Family orchidaceae is characterized by presence of three anthers.
b) Genus Jatropa belongs to family Euphorbiaceae.
c) % sign indicates percentage of flowers.
d) The species which are restricted to particular area is called as endemic.

Q.2 Answer the following questions. (Any Six) **12**

a) Define Taxonomy.
b) Give any 4 characters of family Myrtaceae.
c) Draw a well labelled diagram of types of inflroescene.
d) Draw well labelled diagram of types of placentation.
e) Define chemotaxonomy.
f) Define hotspots.
g) Define in-suit conservation.
h) What is species concept?

Q.3 Answer the following questions. (Any Three) **12**

a) Write a note on effective & valid publication.
b) Write a note on types of typification.
c) Write a note on principles of ICBN.
d) Write a note on floristic work in Maharashtra.

Q.4 Answer the following question. (Any Two) **12**

a) Describe method of herbarium preparation.
b) Write a note on botanical gardens.
c) Describe APG system of classification.

Q.5 Answer the following question. (Any Two) **12**

a) Write a note on rejection of names in taxonomy.
b) Describe Besseys system of classification & add a note on its merits.
c) Give general characters of family Bignonaceae.

Seat No.		Set	P

M.Sc. (Botany) (Sem - I) (New) (NEP CBCS) Examination: March/April - 2025: Plant Growth and Development (2314107)

Day & Date: Monday, 19-May-2025 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative (MCQ). **08**

1) ____ type of light do phytochromes primarily absorb.
a) UV light b) Blue light
c) Red light d) Green light

2) Phytochromes exist in ____ form.
a) P700 and P680 b) Pr and Pfr
c) PhyA and PhyB d) Red and far-red

3) ____ is the primary function of cryptochromes in plants.
a) Photosynthesis b) Water transport
c) Nutrient absorption d) Circadian rhythm regulation

4) Programmed cell death commonly referred to as ____.
a) Apoptosis b) Necrosis
c) Autophagy d) Senescence

5) ____ of the following does NOT typically contribute to the senescence of leaves in plants.
a) Decrease in chlorophyll production
b) Increased production of ethylene
c) Accumulation of toxic metals
d) Shortening of daylight hours

6) Which hormone is primarily responsible for the ripening of many fruits?
a) Auxin b) Cytokinin
c) Ethylene d) Gibberellin

7) CCC also called as ____.
a) Chloroform Concentration Control
b) Cyclocel
c) Calcium Carbonate Compound
d) Controlled Crop Chemical

8) Triacontanol is often used in which type of agriculture?

a) Organic farming b) Conventional farming
c) Hydroponics d) All of the above

B) Write True/False. **04**

a) Photomorphogenesis is the primary function of phytochrome in plants
b) During fruit ripening Carbohydrates decreases.
c) Auxinsplay an important role in the cell elongation.
d) Mutants can help identify the function of specific genes in physiological processes.

Q.2 Answer the following questions. (Any Six) **12**

a) Define plant growth regulators.
b) What is post-harvest technology.
c) Define senescence.
d) Define Phytochrome.
e) Which hormone is responsible for ripening of fruits?
f) What is the role of cryptochromes?
g) Write the role of jasmonates.
h) Which part of the seed develops into the root during germination?

Q.3 Answer the following questions. (Any Three) **12**

a) Describe role of phytochromes.
b) Explain post-harvest technology for leafy vegetables.
c) Describe mechanism of action of gibberellin
d) Write a note on signalling in plants.

Q.4 Answer the following question. (Any Two) **12**

a) Describe in brief signalling mechanism of cytokinin.
b) Explain in detail senescence of leaves.
c) Describe role of triacontanol.

Q.5 Answer the following question. (Any Two) **12**

a) Give discovery & mechanism of action of jasmonates.
b) Describe Mutants in Arabidopsis for flowering.
c) Describe in brief outline of physiology of seed germination.

Seat No.		Set	P

M.Sc. (Botany) (Sem - I) (New) (NEP CBCS) Examination:
March/April - 2025
Herbal & Drug Technology (2314108)

Day & Date: Monday, 19 May 2025 Max. Marks: 60
Time: 3:00 P.M. To 5:30 P.M.

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative (MCQ). **08**

1) Bhasma is a powder prepared by ____.
a) Fermentation b) Calcination
c) Formulation d) Ghrita

2) The term cosmeceutical was first time used by ____.
a) William Gerwick b) Raymond Reed
c) Stephen DeFelice d) Samuel Thompson

3) The residue remaining after incineration is called as ____.
a) Extract b) Waste material
c) Ash d) Foreign material

4) Phytosomes are also known as ____.
a) Lysosomes b) Herbosomes
c) Phycosomes d) Liposomes

5) The first concept of Ayurveda is ____.
a) Atharvaveda b) Charka Samhita
c) Sushruta Samhita d) Samved

6) Biopesticides are effective in ____.
a) Large concentration b) Small concentration
c) Medium concentration d) Synthetic form

7) *Spirulina* is a biomass of ____.
a) Cyanobacteria b) Blue green algae
c) a and b d) none of these

8) Which of the following is Not a method of drug evaluation?
a) Analytical evaluation b) Biological evaluation
c) Geographical evaluation d) Physical evaluation

B) Fill in the blanks. **04**

a) Herb derived from the word____.
b) GAP Stands for ____.
c) Neem belongs to the family ____.
d) Prebiotics are ____.

Q.2 Answer the following questions. (Any Six) **12**

a) Explain the term Herbal excipients.
b) Enlist the examples of skincare products.
c) Define herb and herbal medicine.
d) What are the herbal formulations?
e) Explain about herbal sweeteners.
f) Give the application of *Spirulina.*
g) What are antioxidants?
h) What are probiotics?

Q.3 Answer the following questions. (Any Three) **12**

a) Give the advantage and disadvantage of herbal excipients.
b) Write the sources and uses of Indian gooseberry.
c) Write the basic principles of GMP.
d) Add a note on future prospects of herbal medicine.

Q.4 Answer the following question. (Any Two) **12**

a) Explain in brief past and present status of herbal medicines.
b) Describe in detailed about Herbal Formulations.
c) What is IPR? Give its types and explain in detail about it.

Q.5 Answer the following question. (Any Two) **12**

a) Describe in detail about herbs as health food.
b) Define pest. Give the various methods of pest control.
c) Write down in detail about oral care.

SLR-ZD-6

Seat No.	

Set P

M.Sc. (Botany) (Sem - I) (New) (NEP CBCS) Examination: March/April - 2025
Research Methodology (2314103)

Day & Date: Saturday, 24-May-2025 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative . 08

1) The main objective of research is to ____.
a) Confirm existing theories
b) Create new knowledge
c) Gather data only
d) Focus on literature analysis

2) A key characteristic of effective research is ____.
a) Subjectivity b) Rigorous methodology
c) Limited scope d) Non-reproducibility

3) In sampling techniques, which type uses random selection of groups?
a) Stratified sampling b) Simple random sampling
c) Systematic sampling d) Cluster sampling

4) Primary data is defined as ____.
a) Data collected by someone else
b) Data collected firsthand for a specific purpose
c) Data already published
d) Data from secondary sources

5) ANOVA is primarily used for ____.
a) Testing differences between two means
b) Testing correlations
c) Testing differences between three or more means
d) Testing proportions

6) The h-index measures ____.
a) Total number of citations
b) Quality and impact of research publications
c) Journal impact factor
d) Number of patents

7) A form of intellectual property protection is ____.

a) Trade secrets b) Marketing strategies
c) Customer loyalty d) Sales data

8) The first step in the research process involves ____.

a) Data collection b) Literature review
c) Identifying the research problem d) Hypothesis formulation

B) WriteTrue or false. **04**

1) Research aims to generate new knowledge and solve existing problems.
2) Secondary data is collected firsthand specifically for a research project.
3) ANOVA can be used to test differences between two or more group means.
4) Intellectual property includes only patents and copyrights.

Q.2 Answer the following questions. (Any Six) **12**

a) What is the primary purpose of research?
b) Name and describe two types of research design.
c) What are the advantages of using primary data in research?
d) Explain the term sampling error.
e) What is a null hypothesis, and why is it important in hypothesis testing?
f) List two data collection methods and provide a brief explanation of each.
g) What is plagiarism in research, and how can it be avoided?
h) Describe the process of obtaining a patent for an invention.

Q.3 Answer the following questions. (Any Three) **12**

a) What are the main differences between qualitative and quantitative research? Give an example of each type.
b) What is research design? What important parts should a good research design include?
c) Why are data validity and reliability important in research? How can researchers make sure their data is both valid and reliable?
d) What is a literature review? How does it help in creating a research hypothesis?

Q.4 Answer the following question. (Any Two) **12**

a) Describe the various methods of data collection. Discuss the advantages and limitations of primary and secondary data.
b) Describe the process of patenting biological materials. What specific challenges do researchers face in this area?
c) How do researchers identify and select a research problem? Discuss the factors that influence this process.

Q.5 Answer the following question. (Any Two) **12**

a) What is ANOVA, and when is it used in research? Discuss its advantages over other statistical tests.

b) Describe the various types of research. How do they differ in terms of purpose and methodology?

c) Explain the different sampling techniques used in research. Compare probability and nonprobability sampling methods.

Seat No.	

Set P

M.Sc. (Botany) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
Biology and Diversity of Gymnosperm and Paleobotany (2314201)

Day & Date: Wednesday, 14-May-2025 Max. Marks: 60
Time: 11:00 AM To 01:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative (MCQ). **08**

1) Arnold (1948) classified ____ into two families namely Williamsoniaceae and Cycadeoideace.
a) Bennettitales b) Filicales
c) Psilophytales d) Coniferales

2) Parallel venation in leaf is present in ____.
a) Cycas b) Ginkgo
c) Welwitschia d) Pinus

3) Petiole of Cycas shows ____ shaped disposition of the vascular bundles.
a) Sigma b) Omega
c) Triangular d) Alpha

4) The leaves of extinct calamites which are arranged in a whorl around a stem nodes are called as ____.
a) Annularia b) Arthropitys
c) Stigmaria d) Astroxylon

5) Himalayan cedar oil is obtained from ____.
a) *Juniperus virginiana* b) *Cedrus deodara*
c) *Abies balsamea* d) *Ginkgo biloba*

6) ____ represents only an imprint of plant part in which original organic matter is lost.
a) Compression b) Petrification
c) Mold d) Impression

7) ____ is also called as a Whisk fern.
a) Rhynia b) Taxus
c) Psilotum d) Ephedra

8) Ephedrine is obtained from ____.
a) Ephedra b) Araucaria
c) Gnetum d) Ginkgo

B) True or false. **04**

a) The sago starch is obtained from Pinus.
b) Gymnosperms lacks vessel in xylem.
c) The pinnate leaves of Cycas shows circinate venation.
d) The seeds in gymnosperms are unprotected and naked.

Q.2 Answer the following questions. (Any Six) **12**

a) Describe Lygenopteris.
b) Write salient features of Coniferales.
c) Explain Annularia.
d) Describe Compression.
e) Give the affinities of Gnetum and Welwitschia.
f) Explain Rhynia.
g) Explain the distinguishing characters of Cordaitales.
h) Explain the morphological characters of Ginkgo.

Q.3 Answer the following questions. (Any Three) **12**

a) Describe Enigmocarpon and Palmoxylon.
b) Give the outline of classification of Gymnosperms according to Sporne (1965).
c) Describe Impression and Petrification.
d) Give the morphological characters of gymnospermic leaves with examples.

Q.4 Answer the following question. (Any Two) **12**

a) Give economic importance of Gymnosperms.
b) Explain the techniques used in fossil studies.
c) Explain the external features of Cycadeoidea with diagram.

Q.5 Answer the following question. (Any Two) **12**

a) Explain the classification of Gymnosperm according to Chamberlain (1934).
b) Explain the morphological characters of Psilotum.
c) Write a note on Indian Fossil Flora.

SLR-ZD-8

Seat No.	

Set | **P**

M.Sc. (Botany) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
Advances in Pathology (2314202)

Day & Date: Friday, 16-May-2025 Max. Marks: 60
Time: 11:00 AM To 01:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and labeled diagrams wherever necessary

Q.1 A) Multiple choice questions. **08**

1) The process of self-fertilization in fungi is known as _____
a) Automixis b) Amphimixis
c) Spermatization d) Somatogamy

2) Macrocyclic rust is the name given to some fungi _____
a) which produces bigger spores
b) where all the five spore stages are produced
c) which completes its life-cycle on a single host
d) which selects many hosts to complete its life-cycle

3) Perfect stage of fungus means _____
a) when the fungus is perfectly healthy
b) when it reproduces asexually
c) when it reproduces sexually
d) when it forms perfect sexual resting spores

4) Tikka disease of groundnut is caused by _____
a) *Aspergillus* b) *Puccinia*
c) *Cercospora* d) *Fusarium*

5) Abiotic diseases include _____
a) Crotch rots in various tree species
b) Improper fertilization
c) Leaf scorch caused by drought or high winds
d) answers b & c are correct

6) Which of the following pathogen is seedborne?
a) *Cercosporaarachidicola* b) *Cercosporapersonata*
c) *Phytophthorainfestans* d) *Sphacelothecasorghi*

7) Grassy shoot of sugarcane is incited by _____
a) MLO b) Bacteria
c) Fungi d) Virus

8) A definition of PLANT DISEASE should include which of the following concepts?

a) disruption of normal functioning
b) constant irritation
c) biotic agent
d) abiotic agent

B) Fill in the blank or Write True/ False: **04**

a) Vitavax, Bavistin, Calisin groups consists of systemic fungicides.
b) A chemical compound that prevents multiplication without killing the fungus is Fungistatic.
c) Fungi occurring on wood are epibiotic.
d) Disease triangle is formed by host, pathogen and environment factors.

Q.2 Answer the following questions. (Any Six) **12**

a) What is penetration?
b) Enlist the phanerogamic diseases.
c) Seed borne pathogens.
d) What is Eradication?
e) What is mycoplasma like Organism (MLO).
f) Describe the 'little leaf of brinjal.
g) Concepts of disease forecasting.
h) Control measures of root parasites.

Q.3 Answer the following questions. (Any Two) **12**

a) What is pathogenicity? Describe different stages in the development of plant diseases.
b) What are the different chemical fungicides for plant disease control?
c) Describe methods of plant disease management.

Q.4 Answer the following question. (Any Two) **12**

a) Describe the classification of plant disease based on causal organisms.
b) Give an account of role of environmental factors on disease development.
c) Describe control methods of seed borne pathogens.

Q.5 Answer the following question. (Any Two) **12**

a) Explain in details of defence mechanism of host plant against pathogens.
b) Write the symptoms, cause and control measures of ‘powdery mildew of teak’.
c) Describe in details of cultural practices of plant disease control.

Seat No.	

Set P

M.Sc. (Botany) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
Crop Physiology (2314207)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 60
Time: 11:00 AM To 01:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and labeled diagrams wherever necessary

Q.1 A) Choose correct alternative' (MCQ) **08**

1) Which of the growth hormone promotes flowering in LDP
a) Ethylene b) Auxin
c) Cytokinin d) GA

2) The role of Antitranspirants is to ____.
a) Synthesis of florigen b) Synthesis of vernaline
c) Check the water loss d) Increase growth of plants

3) In Plant food transport takes place through ____.
a) Xylem b) Phloem
c) both a & b d) none of above

4) Permanent and irreversible changes in size, shape and structure of plant is known as ____.
a) Growth b) Respiration
c) Flowering d) None! of these

5) Synthesis of florigen hormone takes place in ____.
a) Root b) Stem apex
c) Leaves d) Fruit

6) Which of the following is Organic fertilizer
a) Compost b) DAP
c) Superphosphate d) Urea

7) During Nitrogen fixation Nitrogenase enzyme require ____ condition for proper functioning.
a) Aerobic b) Aerobicun
c) both a & b d) none of these

8) Following are the PGR ____.
a) G.A. b) Auxins
c) Cytokinins d) All of these

B) Write true/false. **04**

a) Long day Plant requires less than 12 hrs sunlightcondition for the initiation of flowering.
b) 2-4-D is potential organic fertilizer
c) The role played by fertilizers in Agriculture only increase yield of crops.
d) Weedicides used to kill viruses.

Q.2 Answer the following questions. (Any Six) **12**

a) Define Vernalization.
b) Define Antitranspirants.
c) What are florigen?
d) Any four functions of GA.
e) Define Nitrogen fixation.
f) Enlist weedicides.
g) Enlist types of fertilizers.
h) Define crop physiology.

Q.3 Answer the following questions. (Any Three) **12**

a) Physiological basis of yield in Wheat.
b) What is Weed? Give an example of weedicides.
c) Role of BARC in agriculture
d) Nitrogen fixation in Chickpea

Q.4 Answer the following question. (Any Two) **12**

a) Describe Fruit Physiology of Ber
b) Describe Post harvest technology for Pomegranate
c) Describe role of IARIT

Q.5 Answer the following question. (Any Two) **12**

a) Research contribution of CAZARI in Agriculture.
b) Physiological basis of yield of cotton.
c) Write a note on water use and N-use efficiency of plant.

Seat No.		Set	P

M.Sc. (Botany) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
Angiosperm Systematics (2314208)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 60
Time: 11:00 AM To 01:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative' (MCQ) **08**

1) What is the main basis of classification in the five-kingdom system?
a) structure of nucleus b) structure of cell wall
c) a sexual reproduction d) mode of nutrition

2) What is GPS?
a) Global Processing System
b) Global Positioning System
c) Geographic Positional System
d) Geographic Processing System

3) Which family is classified under the order lamiales as per Bentham and Hooker system of classification.
a) Curvembrae b) Microspermae
c) Glumaceae d) Lamiaceae

4) Largest herbarium in the world found in ____.
a) Kew b) Canada
c) Europe d) None of these

5) The flora of British India was edited by ____.
a) George Bentham b) Robert Hook
c) Linnaeus d) J.D. Hooker

6) The term ‘Adaptive radiation’ was first used by ____.
a) Simpson b) Hurley
c) Linnaeus d) Osborne

7) What is basic output of GIS or spatial data analysis?
a) Software b) Numbers
c) Locations d) Map

8) Order microspermae is classified under in which Family by Bentham and Hooker system of classification?

a) Orchidaceae b) Lamiaceae
c) Glumaceae d) Achlymydosporeae

B) Fill in the blanks: **04**

a) Quick referral system in taxonomic studies is ____.
b) The term refers to the process of flattening and drying plants specimens in herbarium is known as ____.
c) Which type of the paper is used for drying plant specimens?
d) GIS strand for____.

Q.2 Answer the following questions. (Any Six) **12**

a) What is Genus?
b) Define Flora.
c) Who propose the five-kingdom system and Enlist these five groups.
d) Write any two roles of cytology in taxonomy.
e) What is the use of GPS system.
f) Enlist techniques involve in Herbarium.
g) What is plant morphology?

Q.3 Answer the following questions. (Any Three) **12**

a) Add a short note on order Celastrales.
b) Add a note on GIS.
c) Write a short note on Monograph.
d) Explain in detail the concept of plant identification.

Q.4 Answer the following question. (Any Two) **12**

a) Add a short note on functions of herbarium.
b) Describe in brief the order Rubiales with respect to Bentham and Hooker system.
c) Explain in detail taxonomic evidences with respect to palynology.

Q.5 Answer the following question. (Any Two) **12**

a) Give a brief account on history of botanical exploration in India.
b) Define herbarium. Explain in details methods of herbarium.
c) Describe in detail the reproductive characteristics of family poaceae. Add a note on economic importance.

Seat No.	

Set **P**

M.Sc. (Botany) (Sem - III) (New) (NEP CBCS) Examination: March/April - 2025
Plant Embryology & Palynology (2314301)

Day & Date: Thursday, 15-May-2025 Max. Marks: 60
Time: 11:00 AM To 01:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. (MCQ) **08**

1) ____ represents female gametophyte of angiosperms.
a) Ovule b) Embryo sac
c) Megaspore mother cell d) Nucellus

2) The outer wall of pollen grain is composed of pectinous substance called ____.
a) Pollenin b) Chitin 1
c) Cellulose d) Calcium

3) ____ is ornamented in pollen grain
a) Nexine b) Exine
c) Intine d) All of them

4) Intine of pollen grain is made up of ____.
a) Lipid and protein b) Pectin and lignin
c) Lignin and cutin d) Cellulose and pectin

5) Pollen grains are stored by ____ methods.
a) Organic solvent b) Freezing temperatures
c) Cryopreservation d) All a, b & c

6) The development of male gametophyte starts from ____
a) Pollen grain b) Megaspore
c) Nucleus d) Pollen sac

7) Vegetative nucleus acts as the ____ for the male nuclei for their entry in pollen tube.
a) Director b) Supported
c) Pusher d) None of the above

8) The first polyembryony was reported by ____.
a) Maheshwari b) Antoni van Leeuwenhoek
c) Johari d) Anton de Bary

B) Fill in the blanks or write True or False: **04**

a) Ricinus communis pollengrains are allergic.
b) Honey is truly an insect product.
c) Filiform apparatus is present in the synergid.
d) Compound pollen grains are found in Ipomoea.

Q.2 Answer the following questions. (Any Six) **12**

a) What is double fertilization in angiosperm?
b) Antipodal cells
c) Give the causes of apomixis.
d) What is Palaeopalynology?
e) Types of styles
f) Antipodal cells
g) Pollen germination
h) Post fertilization changes

Q.3 Answer the following questions. (Any Three) **12**

a) Describe types and causes of polyembryony.
b) Palynology: Scope and branches.
c) Describe brief outline of ultra structure of male gametophyte.
d) Give an account on pollen and spore allergy.

Q.4 Answer the following questions. (Any Two) **12**

a) Describe abnormal male gametophyte and their features.
b) Write significance of pollen pistil interaction.
c) Describe the techniques of palaeopalynology.

Q.5 Answer the following questions. (Any Two) **12**

a) Apospory
b) Melittopalynology
c) Pollen viablity

Seat No.		Set	P

M.Sc. (Botany) (Sem - III) (New) (NEP CBCS) Examination: March/April - 2025
Cytogenetics and Crop Improvement (2314302)

Day & Date: Saturday, 17-May-2025 Max. Marks: 60
Time: 11:00 AM To 01:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Multiple Choice Question: **08**

1) To submit a new genomic sequence to NCBI ____ tool is used.
a) ORF finder b) Bankit
c) Spidey d) e-PCR

2) Plant that have been genetically modified to possess a new trait is called ____.
a) Transgenic plants b) Mutagenic plants
c) Sterile plants d) Homogenic plant

3) NCBI stands for ____.
a) National Council of Biotechnology Institute
b) National Centre for Biotechnology Information
c) National Council of Biotechnology Information
d) National Centre for Biotechnology Institute

4) Linkage map and genetic map are constructed on the basis of ____.
a) Protoplasmic fusion b) Recombination frequencies
c) Hybridization d) Cybridization

5) The set of several similar genes, formed by duplication of a single original gene is called _____
a) Gene amplification b) Gene conversion
c) Gene family d) Gene mutation

6) The duration of Patent is for ____ years.
a) 20 b) 50
c) 45 d) None of the above

7) _____ technology is a method for producing large number of identical antibodies called monoclonal antibodies.
a) Hybridoma b) Hybridization
c) Somaclonal d) Recombination

8) Part of chromosome that links sister chromatids is called ____.

a) Telomere b) Centromere
c) Euchromatin d) Chromatin

B) Write true/false: **04**

a) Solenoid model describes the organization of nucleosomes.
b) In hybridoma technology, hybrid cells are selected in HAT medium.
c) Trade secret is not the domain of IPR.
d) PDB stands for Protein Data Bank.

Q.2 Answer the following questions. (Any Six) **12**

a) Explain GenBank.
b) Give the function of Molecular markers.
c) Define Somaclonal variation.
d) Explain Sequin tool of NCBI.
e) What is Trade secret?
f) Define gene conversion.
g) Define Chromosome Mapping.
h) What are transgenic plants? Give any one example.

Q.3 Answer the following questions. (Any Three) **12**

a) Explain Gene amplification.
b) What is the role of Rec A and Rec B, enzymes in recombination?
c) Explain genetic mapping and physical mapping.
d) Describe genome organization in Virus.

Q.4 Answer the following question. (Any Two) **12**

a) Explain the procedure of somatic hybridization.
b) Explain molecular mechanism of recombination.
c) Explain the domains of IPR and add a note on importance of IPR.

Q.5 Answer the following question. (Any Two) **12**

a) Write a note on PDB.
b) Describe Mobile genetic elements and give its significance.
c) Explain different types of BLAST.

SLR-ZD-14

Seat No.	

Set P

M.Sc. (Botany) (Sem - III) (New) (NEP CBCS) Examination: March/April - 2025
Advances in Plant metabolism and Biochemistry (2314306)

Day & Date: Monday, 19-May-2025 Max. Marks: 60
Time: 11:00 AM To 01:30 PM

Instructions: 1) All questions are compulsory.
2) All questions carry equal marks.
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative (MCQ). **08**

1) CAM pathway presents in ____ plant members.
a) Braceacaceae b) Casurinaceae
c) Crassulaceae d) Apiaceae

2) ____ is the main precursor of secondary metabolites metabolism.
a) Melanin b) Metheonine
c) Tryptophan d) Alanine

3) Glycolysis takes place in ____.
a) Mitochondria b) Ribosome
c) Chloroplast d) Glyoxysomes

4) ____ is called as cyclic photophosphorylation.
a) PSI b) PSI 11
c) Cytochrome d) Plastoquinone

5) Pentose phosphate pathway shows presence of ____ complex.
a) 1 complex b) 2complex
c) 3 complex d) 4 complex

6) ____ is first CO_2 acceptor in C4 cycle.
a) OAA b) Glycolate
c) PEP d) PGA

7) Photolysis occurs in ____.
a) Photosystem I b) Photosystem II
c) Photolysis III d) Photosystem IV

8) Alkaloids shows presence of ____.
a) Phenol ring b) Benzene ring
c) Both a & b d) Alcohol

B) Write true/false: **04**

a) Glycolysis is a type of photosynthesis.
b) Rubisco is one of the product of respiration.
c) Shikimic acid pathway used to regulate photosynthesis in plants.
d) Amount of phosphate is large in soil rather than plants.

Q.2 Answer the following questions. (Any Six) **12**

a) Define secondary metabolites.
b) Define PCR cycle.
c) Define phosphorous metabolism.
d) Define sulphur metabolism.
e) Draw a well labeled ultra structure of chloroplast.
f) What is photosystem II.
g) Define photosynthesis.
h) Give the names of different metabolic pathways in plants.

Q.3 Answer the following questions. (Any Three) **12**

a) Describe in detail C3 pathway.
b) Write-a note on photorespiration. In plants.
c) Describe gluconeogenesis.
d) Give the difference between Photosystem I & II.

Q.4 Answer the following question. (Any Two) **12**

a) Describe in detail CAM pathway.
b) Describe shikimic acid pathway.
c) Write a note on ultra structure of chloroplast.

Q.5 Answer the following question. (Any Two) **12**

a) Give the difference between C3 & C4 cycle.
b) Describe in detail TCA cycle.
c) Describe in detail Pentose phosphate pathway.

Seat No.	

Set **P**

M.Sc. (Botany) (Sem - III) (New) (NEP CBCS) Examination: March/April - 2025
Recent Trends in Angiosperm Taxonomy (2314307)

Day & Date: Monday, 19-May-2025 Max. Marks: 60
Time: 11:00 AM To 01:30 PM

Instructions: 1) All questions are compulsory.
2) Figure to right indicate full marks.

Q.1 A) Choose correct alternative (MCQ). **08**

1) In numerical taxonomy, the process of grouping species based on similarity coefficient is known as _____.
a) Clustering b) Dendrogram
c) Phylogeny d) Morphometry

2) We can understand general relationships of plants is by ___.
a) Cytotaxonomy b) Experimental taxonomy
c) Numerical taxonomy d) Chemotaxonomy

3) ____ is NOT a key feature of numerical taxonomy?
a) Use of Quantitative data
b) Objectivity in classification
c) Use of phenotypic characters only
d) The application of statistical techniques

4) In chemotaxonomy, organisms are classified with the help of ____.
a) DNA sequences b) Proteins and lipids
c) Chlorophyll content d) Morphological features

5) Most important chromosomal feature for cytotaxonomy is ____.
a) Color of chromosome
b) Centromeric position and banding pattern
c) RNA Content
d) Protein Synthesis

6) Which of the following techniques is a common feature of plant surface structure that can be studied using TEM?
a) Chloroplast b) Cuticle and cell wall
c) Phloem and xylem d) Flowering patterns

7) In an e-Herbarium, image is typically stored in ____ format.
a) Only text
b) Physical photographs
c) Digital images, often in JPG or TIFF formats
d) audio recordings

8) In APG III system, highest taxonomic rank is ____.

a) Kingdom b) Phylum
c) Class d) Order

B) Fill in the blanks: **04**

a) In numerical taxonomy, the method of evaluating the relationships between species is often visualized through a ____.

b) ____ is used as chemical markers commonly used in chemotaxonomy to identify species in the genus *Citrus.*

c) ____ technique is commonly used in cytotaxonomy for analyzing chromosomes.

d) APG-III system of recognizes ____ major clades within the Angiosperm.

Q.2 Answer the following questions. (Any Six) **12**

a) Define nomenclature in plant taxonomy.
b) Write down any four demerits of Numerical Taxonomy.
c) What is karyotype?
d) Define E- Herbarium.
e) Write down the any four applications of E-herbarium?
f) What is Chemotaxonomy?
g) What is cytotaxonomy, and how does it differ from traditional taxonomy?
h) What is the main principle behind APG III system of classification?

Q.3 Answer the following questions. (Any Three) **12**

a) Add a short note on cladogram.
b) What is chemotaxonomy and give me their biological significance.
c) Discuss the chromosome number in detail.
d) Write down the merits of APG III system of classification.

Q.4 Answer the following question. (Any Two) **12**

a) Discuss the construction of taxonomic group (OTUs).
b) Give the brief account on preparation of E-Herbarium.
c) Add a short note on seed proteins.

Q.5 Answer the following question. (Any Two) **12**

a) Explain the concept of cladistics and its importance in modern systematics?
b) Discuss the applications of data in the classification of higher taxa.
c) Give the short note on APG III system of classification.

SLR-ZD-17

Seat No.	

Set P

M.Sc. (Botany) (Sem - III) (Old) (CBCS) Examination: March/April - 2025
Plant Embryology and Palynology (MSC24301)

Day & Date: Thursday, 15-May-2025 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Question no 1 & 2 are compulsory.
2) Attempt any three questions from Q.no 3 & Q.No.7.
3) All questions carry equal marks.
4) Draw neat and labelled sketches whenever necessary.
5) Figure to right indicate full marks

Q.1 A) Choose the correct alternative. **10**

1) Development of embryo sac from somatic cell is called as ____.
a) Diplospory b) Apospory
c) Adventive embryony d) Apogamy

2) In solid style ____ tissue acts as a conducting tissue.
a) Transmitting b) Parenchymatous
c) Canal d) Prosenchymatous

3) A specialized layer, present on the stigmatic surface is known as
a) Hellicle b) Pellicle
c) Cuticle d) Pericycle

4) NPC system was described by ____.
a) Wood house b) P.K.K Nair
c) Grew d) Erdtman

5) Melittopalynology is the study of spores and pollen ____.
a) Fossils b) Air
c) Honey d) Excretory matter

6) ____ is the study of fossil pollen and spores.
a) Palynotaxonomy b) Paleopalynology
c) Aeropalynology d) Agropalynology

7) Aeropalynology is the study of spores and pollen in ____.
a) Fossil b) Honey
c) Air d) Excretory matter

8) ____ consists of single pollen grains.
a) Monad b) Dyad
c) Tetrad d) Pseudomonad

9) Formation of seeds without syngamy is known as ____

a) Amphimixis b) Apomixis
c) Polyembryony d) None of the above

10) Occurrence of more than one embryo in a seed is known as ____.

a) Apospory b) Diplospory
c) Polyembryony d) Parthenocarpy

B) Write True or False: **06**

a) The term palynology has been coined for the first time by Hyde and Williams.
b) Distal poleis facing towards the centre of a tetrad.
c) The very long and narrow aperture of pollen is known as Sulcus.
d) Nucellar polyembryony is found in Citrus.
e) Development of male gametophyte begins with in microspore.
f) Sexual incompatibility is due to the formation of Callose.

Q.2 Answer the following questions. **16**

a) Apospory
b) Microfossil groups
c) Filamentous style
d) Pollen allergy

Q.3 Answer the following questions.

a) Describe in brief the development of Male Gametophyte. **10**
b) What is Aeropalynology describe in brief pollen storage. **06**

Q.4 Answer the following question.

a) What is Aeropalynology? Discus it's principles, techniques and applications. **10**
b) Describe in brief Apomixis. **06**

Q.5 Answer the following question.

a) Role of Paleopalynology in oil exploration. **08**
b) Another culture technique. **08**

Q.6 Answer the following question.

a) Palynology in relation to taxonomy. **08**
b) Significance of pollen-pistil interaction. **08**

Q.7 Answer the following question.

a) Organisation and foraging behaviour of Bees. **08**
b) Ultrastructure of pollen wall. **08**

Q.8 Answer the following question.

a) What is Polyembryony? Describe in brief its application **08**
b) Describe in brief structure of stigma and style. Add note on significance of pollen pistil interaction. **08**

Seat No.		Set	P

M.Sc. (Botany) (Sem - III) (Old) (CBCS) Examination: March/April - 2025
Cytogenetics and Crop Improvement (MSC24302)

Day & Date: Saturday, 17-May-2025 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Question no 1 & 2 are compulsory.
2) Attempt any three questions from Q.no 3 & Q.No.7.
3) Figure to right indicate full marks

Q.1 A) Choose the correct alternative. **10**

1) BLAST stands for ____.
a) Base Local Alignment Search Tool
b) Basic Logic Alignment Search Tool
c) Basic Local Alignment Search Tool
d) Base Local Alignment Search Technique

2) Trademarks are registered under ____.
a) Trademark Act 1920 b) Trademark Act 1999
c) Trademark Act 1980 d) Trademark Act 1998

3) The duration of Patent is for ____ years.
a) 20 b) 50
c) 45 d) None of the above

4) ____ is a retrieval tool in NCBI.
a) Bankit b) Entrez
c) Sequin d) ORF finder

5) Part of chromosome that links sister chromatids is called ____.
a) Telomere b) Centromere
c) Euchromatin d) Chromatin

6) The process by which one DNA sequence replaces a homologous sequence which becomes identical is known as ____.
a) Gene amplification b) Gene conversion
c) Gene family d) Gene duplication

7) Linkage map and genetic map are constructed on the basis of ____.
a) Protoplasmic fusion b) Recombination frequencies
c) Hybridization d) Cybridization

8) A region of repetitive nucleotide sequences associated with specialized proteins at ends of chromosomes is ____.
a) Centromere b) Chiasma
c) Telomere d) Chromatin

9) Plant that have been genetically modified to possess a new trait is called ____.

a) Transgenic plants b) Mutagenic plants
c) Sterile plants d) Homogenic plant

10) In hybridoma technology, hybrid cells are selected in ____ medium.

a) Nutrient b) MS
c) HAT d) PDA

B) Write True or False: **06**

a) A patent is an exclusive right granted for an invention.
b) The physical link between two non sister chromatids of homologous chromosomes is centromere.
c) Flavr savr tomato is an example of transgenic plant.
d) PDB is a database for 3D structural data of proteins.
e) lPR is Intellectual Personal Rights.
f) Solenoid model describes the organization of nucleosomes.

Q.2 Answer the following questions. **16**

a) What is Trade Mark and Trade secret?
b) Give the function of Molecular markers.
c) Differentiate between Physical and Genetic Mapping.
d) Explain GenBank.

Q.3 Answer the following questions. **16**

a) Explain the procedure of somatic hybridization.
b) Explain the domains of IPR and give its significance.

Q.4 Answer the following question. **16**

a) What is bioinformatics? Give the uses of Bioinformatics in biological research.
b) Explain the architectural differences of genome in prokaryotes and eukaryotes.

Q.5 Answer the following question. **16**

a) Describe Mobile genetic elements and give its significance.
b) Explain site specific recombination.

Q.6 Answer the following question. **16**

a) Give the role of Rec A, Rec B Rec C Rec D enzymes in recombination.
b) Describe genome organization in Bacteria and Virus with diagram.

Q.7 Answer the following. **16**

a) What is BLAST? Explain the different types of BLAST
b) Explain gene families.

Seat No.	

Set P

M.Sc. (Botany) (Sem - III) (Old) (CBCS) Examination: March/April - 2025
Advances in Plant metabolism and Biochemistry (MSC24306)

Day & Date: Monday, 19-May-2025 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) question no 1 & 2 are compulsory.
2) attempt any three questions from Q.no 3 & Q.No.7.
3) Figure to right indicate full marks

Q.1 A) Choose the correct alternative. **10**

1) In mitochondria ATP formation is carried out by ____.
a) ATPase b) Catalase
c) Peroxidase d) None of these

2) First ejected electron in photosytem I accepted by
a) FRS b) pQ
c) PGAL d) O_2

3) In C_4 plants ____ acts as CO_2 acceptor.
a) PEPA b) Malic acid
c) OAA d) RUBP

4) Glycolysis is also known as ____.
a) EMP pathway b) Pentose Phosphate pathway
c) Chloroplast d) Peroxisomes

5) ____ is the sulphur containing amino acid.
a) Methoinine b) Cysteine
c) Both a & b d) None of these

6) Phosphorus uptake in alkali soil in the form of
a) H_2PO_4 b) HPO_4^{2-}
c) PO_4^{3-} d) H_3PO_4

7) ____ of the following is NOT the class of secondary metabolite.
a) Terpenes b) Amino acids
c) Phenolics d) Alkaloids

8) CAM pathway present in ____ plant members.
a) Braceacaceae b) Casurinaceae
c) Crassulaceae d) Apiaceae

9) ____ is the main precursor of secondary metabolites metabolism.
a) Melanin b) Methconine
c) Tryptophan d) Alanine

10) ____ is called as cyclic photophosphorylation.

a) PSI I b) PSI II
c) Cytochrome d) Plastoquinone

B) Write True or False: **06**

a) Glycolysis is a type of photosynthesis.
b) CAM means crassulasian acid metabolism.
c) Photolysis takes place in Photo system ll.
d) Pentose phosphate pathway shows IV complex.
e) first CO_2 acceptor in C3 pathway is OAA.
f) Glycolysis shows break down of sugars.

Q.2 Answer the following questions. **16**

a) Write a note on photorespiration.
b) Write a note on any two types of secondary metabolites.
c) Write a note on Photosystem II.
d) Write note on ultra structure of chloroplast.

Q.3 Answer the following questions. **16**

a) Describe in detail CAM pathway.
b) Describe in Detail shikimic acid pathway.

Q.4 Answer the following question. **16**

a) Describe phosphate metabolism in plants.
b) Describe in detail Pentose phosphate pathway.

Q.5 Answer the following question. **16**

a) Describe in detail Electron Transport Chain.
b) Compare between C_4 and CAM pathway.

Q.6 Answer the following question. **16**

a) What are the factors controlling phosphorus uptake?
b) Describe in brief any two major metabolic pathways in plants.

Q.7 Answer the following. **16**

a) Explain the role of enzyme alternate oxidase.
b) Write a note on sulphate metabolism.

Seat No.	

Set **P**

M.Sc. (Botany) (Sem - III) (Old) (CBCS) Examination: March/April - 2025
Angiosperm Systematics(MSC24307)

Day & Date: Monday, 19-May-2025 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Question no 1 & 2 are compulsory.
2) Attempt any three questions from Q.No.3 & Q.No.7.
3) Figure to right indicate full marks

Q.1 A) Choose the correct alternative. **10**

1) The term 'Adaptive radiation' was first used by ____.
a) Simpson b) Hurley
c) Linnaeus d) Osborne

2) In the system of classification by Bentham and Hooker dicotyledonous plants have been classified as ____.
a) Polypetalae, Gamopetalae, Monochlamydae
b) Polypetalae, Gamopetalae, Dichlamydae
c) Archechlamydae, Polypetalae, Monochlamydae
d) None of these

3) Galopagos fishes are a good example of ____.
a) Adaptive radiation b) Extinction
c) Island gigantism d) Hetrochromia

4) The flora of British India was edited by _____.
a) George Bentham b) Robert Hook
c) Linnaeus d) J.D. Hooker

5) The more complete flora is one that account for _____.
a) Vascular plants b) Non vascular plants
c) Spore producing plants d) None of these

6) Which of these is most effective means of conserving biodiversity?
a) Preserve habitats
b) Get rid of predators
c) Census species during the breeding season
d) Vaccinate species against disease

7) Which of these is a suitable example of ex-situ conservation?
a) National parks b) Wild life sanctuary
c) Sacred grove d) Seed bank

8) Which of the following is the exotic weed?

a) Abutilon indicum b) Combratumindicum
c) Jasmine malbaricum d) Ipomaea cornea

9) Which one of the following trees are found in tropical rainforest?

a) Mahogany b) Teak
c) Sal d) Peepal

10) Subclass polypetalae includes the series _____.

a) Thalamiflorae b) Disciflorae
c) Caliciflorae d) All the three

B) Fill in the blanks: **06**

1) _____ is the evolution before origin of life when atmosphere was full of NH_3 and methane but after origin of life it changed.
2) A system of classification, in which a large number of traits are considered is ____.
3) Scientist use dichotomous keys to ____.
4) Indented keys are also known as ____.
5) In India ____ type of forest occupies the largest area.
6) ____ series includes the epigynous flowers.

Q.2 Answer the following questions. **16**

a) Write a short note on 'Ecological variation'.
b) Explain in detail criteria used for the classification.
c) Give the need and significane of floristic.
d) Write down the Functions and importance of herbarium.

Q.3 Answer the following questions. **16**

a) Explain in detail APG system of classification.
b) Give a brief account on importance and need of classification of the plant.

Q.4 Answer the following question. **16**

a) Write short note important herbaria of the world.
b) Explain in detail about indented key.

Q.5 Answer the following question. **16**

a) What is biodiversity? Explain in detail types of biodiversity.
b) Enlist the phytogeographical regions in India and describe in detail.

Q.6 Answer the following question. **16**

a) Give the brief account on artificial system of classification.
b) Describe in detail the adaptations of mangrove.

Q.7 Answer the following. **16**

a) Explain in detail the in-situ method of conservation.
b) What is general biological principle describe in detail.

SLR-ZD-23

Seat No.	

Set P

M.Sc. (Botany) (Sem - IV) (New) (NEP CBCS) Examination: March/April - 2025
Phytogeography & Plant Ecology (2314401)

Day & Date: Wednesday, 14-May-2025 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figure to right indicate full marks.

Q.1 A) Choose correct alternative. **08**

1) How many types of plants species arc found in India?
a) About 45,000 b) About 40,000
c) About 47,000 d) About 20,000

2) Which one of the following states does not have the Tropical deciduous forests?
a) Jharkhand b) Western Orissa
c) Chhattisgarh d) Rajasthan

3) Which one of the following trees is found in tropical rainforests?
a) Mahogany b) Teak
c) Sal d) Peepal

4) Plant community which has grown naturally without human aid and has been left undisturbed by humans for long time is termed as _____.
a) Tundra vegetation b) Virgin vegetation
c) Taiga plants d) None of the above

5) Ebony, Mahogany and Rosewood trees are grown in which of the following forests?
a) Coniferrous forests b) Tropical rain forest
c) Tropical Thorn forests d) Deciduous forests

6) Silver Fir is found in the following type of vegetation zone _____.
a) Mangrove forests b) Thorn forests
c) Montane forests d) Deciduous forests

7) A very large ecosystem on land having distinct type of vegetation and wildlife is called _____.
a) Ecology b) Biome
c) Biodiversity d) Biosphere reserve

8) Most widespread vegetation in India is _____.
a) Coniferous forests
b) Tropical Rain forests
c) Tropical Deciduous forests
d) Mangrove forests

B) Write true/false. **04**

1) Western Ghats is one of the most prevalent hotspots of biodiversity in India.
2) Seed bank is an example of an ex-situ conservation.
3) Exotic species is defined as an ecological state of a species being unique to a specific geographic location.
4) Global warming can significantly be controlled by: Increasing solid waste.

Q.2 Answer the following question (Any Six) **12**

a) Define Ecology.
b) What is Phytogeography?
c) Define endemism.
d) What are hotspots?
e) What is green credit programme?
f) Define Biodiversity.
g) Define greenbelt.
h) Enlist any two endemic plant species.

Q.3 Answer the following question (Any Three) **12**

a) Comment upon RET plant species.
b) Comment upon local vegetation of Solapur district.
c) Comment upon green credit.
d) Explain in brief endemism.

Q.4 Answer the following question (Any Two) **12**

a) Explain in brief modelling of greenbelt and its plantation design.
b) Explain in brief water and sustainable agriculture based green credit.
c) Explain in brief Age and area hypothesis.

Q.5 Answer the following question (Any Two) **12**

a) Explain in brief mangrove vegetation of India.
b) Comment upon Biological diversity act 2002.
c) Explain in brief Phytogeographical division of India.

Seat No.	

Set P

M.Sc. (Botany) (Sem - IV) (New) (CBCS) Examination: March/April - 2025
Plant Tissue culture, Greenhouse Technology & Hydroponics (2314402)

Day & Date: Friday, 16-May-2025 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. **08**

1) The embryo rescue is _____.
   a) treatment of embryo for the elimination of diseases.
   b) removing of embryo under controlled condition and formation of new plant.
   c) prevention of onset of dormancy of young embryo.
   d) for breaking of dormancy.

2) In tissue culture the needle and forceps are sterilizes through _____.
   a) Water bath at 2000˚C b) dry air oven
   c) autoclave d) sprit lamp

3) The best method to obtain virus free plant through tissue culture is _____.
   a) Embryo rescue b) protoplast culture
   c) meristem culture d) anther culture

4) _____ is best frequently used to induce soma clonal variation.
   a) PDB b) 2,4 D
   c) NAA d) PEG

5) _____ is an initial for cybrid production.
   a) Emasculation b) Fertilization
   c) Pollination d) Protoplast isolation and fusion

6) In the process of protoplast isolation, _____ is used to maintain proper osmotic pressure in the isolation mixture.
   a) sucrose b) NaCl
   c) Mannitol d) Phosphate buffer

7) What is agar?
   a) A nutrient b) Vitamins
   c) Broth d) A solidifying agent

8) Green house plants are photo synthetically more efficient because the high % of _____.

a) N_2 b) O_2
c) CO d) CO_2

B) Write True/False. **04**

1) Haploid production is main application of embryo culture.
2) Indole -3- acetic acid is cytokinin.
3) Rock wool is siliceous mineral of volcanic origin used as soil less culture for green house.
4) Development of shoot and root in tissue culture is determined by Cytokinin to auxin ratio.

Q.2 Answer the following. (Any Six) **12**

a) Write objectives of plant tissue culture.
b) Describe sterilization methods.
c) Cell suspension culture
d) Embryo rescue
e) Synthetic seeds
f) Enlist types of Greenhouses.
g) Types of Hydroponics systems
h) Principles of invitro culture

Q.3 Answer the following. (Any Three) **12**

a) Medias used in Hydroponics
b) Write note on Anther culture
c) Bioreactors
d) Describe any three types of green houses with suitable diagram.

Q.4 Answer the following. (Any Two) **12**

a) Fertigation in Greenhouse
b) Cell suspension culture
c) Types of hydroponics

Q.5 Answer the following. (Any Two) **12**

a) Embryo culture
b) Application of Hydroponics
c) Pest and disease control in greenhouse

Seat No.	

Set **P**

M.Sc. (Botany) (Sem - IV) (New) (NEP CBCS) Examination: March/April - 2025
Environmental Plant Physiology (2314405)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

Q.1 A) Choose correct alternative. **08**

1) Hydroxyl (OH*) ions are harmful because they cause _____.
a) Decrease in chlorophyll content
b) Increase in RNAase

2) An exposure to UV radiations stimulates synthesis of ____ in plants.
a) Phenols b) Proline
c) Anthocyanins d) Chlorophylls

3) Following is the main target of chilling stress _____.
a) Strach b) Phospholipids
c) Proteins d) Chlorophylls

4) Electrical conductivity of typical saline soil is _____.
a) Less than 4ds b) More than 4ds
c) Equal to zero d) Not measurable

5) Chilling injury occurs when warm region plants are exposed to a temperature of _____.
a) 0-10^{0}C b) 10-15^{0}C
c) 25-35^{0}C d) less than ^{0}C

6) Slat glands are present in halophytes showing _____ Phenomenon.
a) Salt evasion b) Salt tolerant
c) Salt insensitive d) All of these

7) Elevated CO_2, concentration causes _____.
a) Increase in photosynthesis
b) Decrease in photorespiration
c) Increase in WUE
d) All of these

8) $CaSO_4$ is used for reclamation of _____ Soil.

a) Acidic b) Alkaline
c) Saline d) Marshy

B) Write True/False **04**

1) In frost injury, ice formation begins at Slightly above the freezing point.
2) There is a deficiency of CO_2 in the waterlogged soils.
3) Peroxidase enzyme plays an important role in the development of arenchyma in wetland species.
4) Proline is a compatible solute.

Q.2 Answer the following. (Any Six) **12**

a) What are different types of stresses?
b) Define Osmolyte.
c) What is mean by Photoinhibition?
d) Define Ice nucleation.
e) Define free radicals.
f) Which gas in the atmosphere hold up the UV rays?
g) What are the causes soil salinization?
h) What is phytoremediation?

Q.3 Answer the following. (Any three) **12**

a) Causes of water logging
b) Free radicals
c) Types of stress
d) Allelopathy

Q.4 Answer the following. (Any Two) **12**

a) Describe the effects of UV on plant metabolism.
b) Explain the Effects of heavy metal toxicity in plants.
c) Describe the flood tolerance mechanism in plants.

Q.5 Answer the following. (Any Two) **12**

a) Explain the Effect of air pollutants (SO2, NOx) on plant metabolism
b) Describe frost injury and frost resistance in plants.
c) Explain the impact of elevated CO_2 concentration on plant metabolism & productivity.

SLR-ZD-27

Seat No.	

Set P

M.Sc. (Botany) (Sem - IV) (New/Old) (CBCS) Examination: March/April - 2025
Phytogeography and Conservation Biology (MSC24401)

Day & Date: Wednesday, 14-May-2025 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) question no 1 & 2 are compulsory.
2) attempt any three questions from Q.no 3 & Q.No.7.
3) Figure to right indicate full marks

Q.1 A) Choose the correct alternative. **10**

1) Prime minister is the chairperson of ____.
a) Ministry environment and forest
b) National board for wildlife
c) State biodiversity board
d) National biodiversity authority

2) ____ is the main factor for the limitations of distribution of taxon.
a) Soil b) Temperature
c) Geology d) Climate

3) Which is the concept being evolved for sustainable agriculture?
a) Agro-forestry b) Polyhouse
c) Community seed bank d) Afforestation

4) ____ are those forest fragments which are commonly protected, and generally have important religious implication for protecting society.
a) Sacred grooves b) Parks
c) Sanctuaries d) Biosphere reserves

5) ____ is not generally seen in biodiversity hotspots.
a) Endemism b) Species richness
c) Loss of diversity d) Lesser interspecific competition

6) ____ occurs when the death of the last individual in a species occurs.
a) Adaptation b) Phylogenic diversity
c) Speciation d) Extinction

7) ____ is defined as an ecological state of a species being unique to a specific geographic location.
a) Exotic species b) Endemic species
c) Ecosystem d) None of the above

8) _____ is the forest cover to be maintained as per the National Forest Policy (1988).
a) 67% for hills & 33% for plains
b) 37% for hills & 11% for plains
c) 17% for hills & 23% for plains
d) None of the above

9) ____ is defined as the number of species represented in a specific region, landscape or an ecological community.
a) Coevolution b) Commensalism
c) Species richness d) Population density

10) The term afforestation means _____.
a) Plantation of tree species on non-forest land.
b) Protect the important tree species.
c) Cut-off the tree species from particular area.
d) Plantation of tree species in forest.

B) Fill in the blanks <u>OR</u> True or False. **06**

a) Tropical Rain forests grow well in area receiving rainfall: ____ mm.
b) One of the most prevalent hotspots of biodiversity in India is: _____.
c) Most widespread vegetation in India is: ____.
d) About 47,000 types of plants species are found in India.
A) True B) False
e) Mahogany trees are found in tropical rainforests.
A) True B) False
f) Trees in thorn forest are: Tall.
A) True B) False

Q.2 Answer the following questions. **16**

a) Comment upon Endemism.
b) What is meant by biodiversity hotspots?
c) Comment upon gene banks.
d) What is meant by Biosphere Reserves?

Q.3 Answer the following questions. **16**

a) Explain phytogeographical division of India.
b) Explain tropical terrestrial biome.

Q.4 Answer the following question. **16**

a) Explain in detail about RET plant species.
b) Explain in detail Age and Area hypothesis.

Q.5 Answer the following question. **16**

a) Explain the concept of Ex-Situ conservation.
b) Explain in brief cryopreservation.

Q.6 Answer the following question. **16**

a) Comment up on the concept of Agroforestry.

b) Comment up on the concept of Sacred Groves and Sthalvrikshas.

Q.7 Answer the following. **16**

a) Explain in detail Biological diversity act 2002.

b) Explain the role of NGO's in conservation of Biodiversity.

Seat No.	

Set P

M.Sc. (Botany) (Sem - IV) (New/Old) (CBCS) Examination: March/April - 2025
Environmental Plant Physiology (MSC24405)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) question no 1 & 2 are compulsory.
2) attempt any three questions from Q.no 3 & Q.No.7.
3) Figure to right indicate full marks

Q.1 A) Choose the correct alternative. **10**

1) Disease occurs in the plants when the pathogen lacks ____.
a) R genes b) Avr genes
c) DIRI genes d) None of these

2) Pathogen associated molecular pattern generally consist of ____.
a) Plant harmone b) microbial structure
c) Floral activating agents d) Photosysnthetic enzymes

3) ____ is the proposed role of reactive oxygen species in plant defense.
a) H2O2 directly toxin to pathogen
b) H2O2 give rise to extremely active free radical
c) H2O2 leads to formation of salicylic acid
d) All the above

4) Which of the following is stress hormone in plants?
a) GA b) ABA
c) Cytokinines d) Ethylene

5) SOD catalyzes the reduction of ____ into hydrogen peroxide.
a) Molecular oxygen b) Singlet oxygen
c) Ozone d) Superoxide

6) S02 and N02 Produce pollution by increasing ____.
a) Alkalinity b) Acidity
c) Neutrality d) Buffer action

7) Electrical conductivity of typical saline soil is ____.
a) Less than 4ds b) More than 4ds
c) Equal to zero d) Not measurable

8) Salt glands are present in halophytes showing ____ Phenomenon.
a) Salt evasion b) Salt tolerant
c) Salt insensitive d) All of these

9) Desert ephemerals are an example of ____ type of plants.
a) Drought resistant b) Drought escape
c) Drought tolerant d) Drought sensitive

10) Accumulation of ____ phytohormone occurs during water logging.
a) IAA b) Cytokinin
c) Ethylene d) a & c

B) Write true/false - **06**

1) Stress physiology is how the plants respond to environmental factor
2) Lead comes under heavy metal
3) Fungal infection comes under biotic stress
4) Plastic & Elastic are types of strain
5) Plants does not have the capacity to tolerate the stress
6) Jasmonate is biosynthesized from linolenic acid

Q.2 Answer the following questions. **16**

a) What is Stress? Explain its types
b) Explain types of salinity
c) Write a note on Photoinhibition
d) Write a note on Causes of Soil salinization

Q.3 Answer the following questions. **16**

a) Explain biosynthesis of Jasmonic acid.
b) What is Oxidative stress? Explain in short

Q.4 Answer the following question. **16**

a) Describe in short hypersensitive response
b) Describe effects of heavy metals on plants.

Q.5 Answer the following question. **16**

a) Write a note on effect of high temperature on plant metabolism.
b) Write a note on cold tolerance.

Q.6 Answer the following question. **16**

a) Describe effect of ultraviolet radiations on plants.
b) Explain effect of SO_2 & NO_2 on plant metabolism.

Q.7 Answer the following. **16**

a) Describe Antioxidant system in plants.
b) Write a note on Causes of Soil salinization.

Seat No.	

Set **P**

M.Sc. (Botany) (Sem - IV) (New/Old) (CBCS) Examination: March/April - 2025
Modern Trends in Angiosperm Taxonomy (MSC24406)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Question Nos. 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7.
3) Figures to right indicate full mark.

Q.1 A) Choose correct alternative from the following questions. 10

1) Pollen sacs (anther sacs) represent ____.
a) Microsporangium b) Megasporangium
c) Sporangium d) Gametangium

2) ____ is/are used as a character of taxonomic significance from anatomy.
a) Structure of stomata b) Floral anatomy
c) Nodal anatomy d) All of these

3) According to the position, the aperture may be ____.
a) Proximal b) Distal
c) Zonal d) All of these

4) The high-speed electronic computers, and the powerful techniques of mathematics are employed in ____.
a) Serotaxonomy b) Cytotaxonomy
c) Numerical taxonomy d) Chemotaxonomy

5) ____ helps us in getting a three-dimensional picture of the specimen.
a) Simple microscope
b) Compound microscope
c) Transmission electron microscope
d) Scanning electron microscope

6) GPS was invented in ____.
a) 1970's b) 1980's
c) 1990's d) 1960's

7) The lowest chromosome number in flowering plants is recorded in *Haplopappus gracillis* which is ____.
a) 2n = 4 b) 2n = 3
c) 2n = 2 d) 2n = 1

8) The needle like crystals ____ was noted in orchids as a feature of taxonomis importance very clearly.

a) Spheraphides b) Raphaides
c) Starch d) All of these

9) ____ state is related with salient valley project.

a) Uttar Pradesh b) Himachal Pradesh
c) Kerela d) Goa

10) RAPD is a ____.

a) DNA sequencing based method
b) PCR based method
c) Restriction digestion based method
d) All of these

B) Write true or false: **06**

1) Sporopllenin helps to preserve pollen grains as microfossils.
2) Stem endodermis and nature of stomata are useful criteria in cytotaxonomy.
3) GIS are used to find the exact location of things.
4) Endangered Spices Act (ESA) passed into law on December 28,1973.
5) Peoples Biodiversity Register is a full form of PBR.
6) The family orchidaceae is characterized by absence of endosperm.

Q.2 Answer the following. **16**

a) Write uses of TEM and SEM.
b) Explain benefits of uses of QR coding.
c) Explain the classification of apertures based on numbers.
d) Explain the role of serology in taxonomy.

Q.3 Answer the following questions. **16**

a) Explain anatomical characters of taxonomic value. Add a note on their role in solving taxonomic problems.
b) Write an application of RAPD, AFLP in molecular systematics.

Q.4 Answer the following questions. **16**

a) Describe the role of embryology in taxonomy with example.
b) Describe in brief patterns of geographic distribution.

Q.5 Answer the following **16**

a) Write a brief account of Palynology in relation to taxonomy.
b) Define endemism. Write an account of primary centres of diversity of plants.

Q.6 Answer the following **16**

a) Write an account of classes of compounds and their biological significance in chemotaxonomic investigations.

b) Explain the role of Deorai and Lead gardens in biodiversity.

Q.7 Answer the following **16**

a) State the applications of numerical taxonomy.

b) Describe Polymerase Chain Reaction (PCR).

Seat No.		Set	P

M.Sc. (Botany) (Sem - IV) (New/Old) (CBCS) Examination: March/April - 2025
Crop Physiology (MSC24407)

Day & Date: Thursday, 22-May-2025 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. no 1 & 2 are compulsory.
2) Attempt any three questions from Q.no 3 to Q.No.7.
3) Figure to right indicate full marks

Q.1 A) Choose the correct alternative. **10**

1) 2,4 Dichlorophenoxy acetic Acid is an example of ____.
a) Weedicide b) Fungicide
c) Insecticide d) Pesticide

2) ____ promotes the cell division and cell proliferation in plant cell.
a) Auxin b) Cytokinin
c) Ethylene d) Abscisic acid

3) The range of phytochrome P fr is ____ nm.
a) 660 b) 500
c) 730 d) 400

4) The translocation of sugar from source to sink takes place through ____.
a) Xylem b) Phloem
c) Both (a) and (b) d) Epidermis

5) ____ is a chemical compound used to kill the growth of unwanted plants.
a) Fungicide b) Weedicide
c) Pesticide d) Insecticide

6) The amount of sucrose in ____ is calculated in form of brix.
a) Sugarcane b) Cotton
c) Wheat d) Groundnut

7) CAZRI is located in ____.
a) Mumbai b) Solapur
c) Nagpur d) Jodhpur

8) Ammonium chloride, Ammonium Sulphate, Urea are ____ type of fertilizers.
a) Phosphorous **b)** Nitrogenous
c) Potash **d)** Mixed

9) _____ forms root nodules which helps in fixation of nitrogen.

a) Mango b) Pomegranate
c) Grapes d) Chickpea

10) The induction of plants flowering process by exposure to prolonged cold temperature is known as ____.

a) Photoperiodism b) Phototropism
c) Photosynthesis d) Vernalization

B) Write true/false - **06**

1) Antitranspirants are applied to the leaves of plant to reduce transpiration.
2) Ethylene regulates the ripening process in fruits.
3) ICRISAT stands for International Crops Research Institute for Semi - Arid Tropics
4) The science and technique applied to agricultural produce after harvest for its preservation, processing and packaging is known as Post Harvest Technology
5) Phytochrome red absorbs 260 nm light.
6) Stem and mature leaves are known as sink

Q.2 Answer the following questions. **16**

a) What is Photoperiodism
b) Describe Mineral nutrition in Groundnut
c) Give any two examples of each source and sink of a plant
d) Explain Harvest Index

Q.3 Answer the following questions. **16**

a) What is Phloem transport? Add a note on factors affecting source-sink relationship
b) Describe Organic farming and give its importance

Q.4 Answer the following question. **16**

a) Explain the different types of fertilizers. Add a note on application of fertilizers through soil
b) Explain Post Harvest Technology of Pomegranate with respect to market strategy

Q.5 Answer the following question. **16**

a) Explain the physiological basis of yield in cotton
b) Central Soil Salinity Research Laboratory and ICRISAT

Q.6 Answer the following question. **16**

a) Write a note on nitrogen fixation in Chickpea
b) Write a note on Central Institute of Medicinal and Aromatic Plants

Q.7 Answer the following. **16**

a) Describe any two Plant Growth Regulators in agriculture

b) Write a note on Weedicide and explain any one weedicide with their mode of action.

Seat No.	

Set **P**

M.Sc. (Botany) (Sem - IV) (New) (Nep CBCS) Examination: March/April - 2025
Industrial Botany (23144046)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

Instructions: 1) All Questions are compulsory.
3) Figures to the right indicates full marks.

Q.1 A) Multiple choice questions. **08**

1) What is the scientific name of Tulsi (Holy Basil)?
a) Azadirachta indica b) Ocimum sanctum
c) Withania somnifera d) Emblica officinalis

2) Which medicinal plant is known as “Indian Ginseng”?
a) Tulsi b) Ashwagandha
c) Brahmi d) Amla

3) What is the role of condenser in Soxhlet apparatus _____.
a) To heat the solvent
b) To cool and condense solvent vapours
c) To hold the sample
d) To mix solvents

4) Which of the following is not a traditional Indian system of medicine
a) Unani b) Ayurveda
c) Surgery d) Sidha

5) In fungal fermentation, the role of aeration in submerged systems is _____.
a) Increase temperature
b) Prevent contamination
c) Provide oxygen for fungal metabolism
d) Remove waste products

6) The main source of alkaloids is _____.
a) Fungi b) Bacteria
c) Plants d) Animals

7) What is the primary source of Taxol?
a) Fungi b) Bacteria
c) Taxus brevifolia d) Eucalyptus

8) Which part of the plant is most commonly used for preparing a decoction?

a) Flowers b) Seeds
c) Roots and Barks d) Leaves

B) Fill in the blanks. **04**

1) Morphine is isolated from the plant _____.
2) LSD stands for _____.
3) Garlic belongs to the family _____.
4) SFE stands for _____.

Q.2 Answer the following. (Any Six) **12**

a) Give the applications of single cell protein.
b) Enlist the sources of crude drugs.
c) Define Pharmacognosy.
d) Give the identification of basil.
e) Define Maceration.
f) Give the medicinal properties of terpenoids.
g) What is aspirin?
h) Define decoction?

Q.3 Answer the following. (Any three) **12**

a) Write a note on biofuel?
b) Describe in brief about pharmacognosy and modern medicine.
c) Write down in brief about the Soxhlet extraction.
d) Write down the source and medicinal properties of morphine.

Q.4 Answer the following. (Any Two) **12**

a) Write down in detailed about fungal technology.
b) Describe in detailed about identification and utilization of onion and aloe vera.
c) What is natural product? Give the source chemical properties and medicinal properties of Aspirin.

Q.5 Answer the following. (Any Two) **12**

a) Describe in detail about percolation and infusion.
b) Give the identification and utilization of turmeric and Fenugreek powder.
c) Write down in detail about phenolics and alkaloids.