SLR-ED-1

Seat No.		Set	P

M.Sc. (Semester - I) (New) (NEP CBCS) Examination: Oct/Nov-2023
BOTANY
Biology & diversity of Algae, Bryophytes, Pteridophytes and Fungi (2314101)

Day & Date: Friday, 05-01-2024 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

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

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

1) Number of layers in the Tapetum of Polypodium are: _____.
   a) One b) Two
   c) Three d) Four

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

3) The fungi which derive their food directly from dead organic matter are known as _____.
   a) Predators b) Decomposers
   c) Mutualists d) Parasitic fungi

4) What does 'Perfect stage' of a fungus indicate?
   a) indicates that it can reproduce asexually
   b) indicates that it is perfectly healthy
   c) indicates that it is able to form perfect sexual spores
   d) All of the above

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

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

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

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

B) Fill in the blanks OR write True/False **04**

1) The protostele in which xylem core is star like is called: Actinostlele.
   a) True b) False
2) In siphonostele, two cylinders of vascular tissue are present in the stele i.e.: Polycyclic.
   a) True b) False
3) Mannitol is a reserved food found in *Chara.*
   a) True b) False
4) In some of the liverworts, spore dispersal is aided by elaters.
   a) True b) False

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

a) Enlist the chlorophyll pigments in Algae.
b) Write down general characters of Pteridophyte.
c) Write down general characters of Bryophyte.
d) Write down general characters of Fungi.
e) Write down any two characters of class Cyanophyceae.
f) Enlist the classes of pteridophytes.
g) Draw a neat labelled diagram of T.S. of *Selaginella* stem.
h) Write down any two characters of class Rhodophyceae.

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

a) Comment upon reproduction in Mucorales.
b) Comment upon lifecycle pattern of Chytridiales.
c) Comment upon lifecycle pattern of Melioles.
d) Comment upon phylogeny of class- Sphenopsida.

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

a) Explain in brief stem anatomy of *Psilotum.*
b) Explain in brief phylogeny of Rhodophyceae.
c) Explain in brief phylogeny of Bacillariophyceae.

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

a) Explain in brief economic importance of Pteridophytes.
b) Explain in brief salient features of Tubercularíales.
c) Explain in brief phylogeny of class Lycopsida.

SLR-ED-2

Seat No.	

Set P

M.Sc. (Semester - I) (New) (NEP CBCS) Examination: Oct/Nov-2023
BOTANY
Taxonomy of Angiosperms (2314102)

Day & Date: Sunday, 07-01-2024 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

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

Q.1 A) Choose correct alternative from the following **08**

1) _____ among the following is an example of family Fabaceae.
   a) *Crinum* b) *Clitoria*
   c) *Citrus medica* d) *Clematis trilobata*

2) Conservation of plants within their own habitat is included under ____.
   a) Conservation b) In-Situ conservation
   c) Ex-Situ conservation d) Tissue culture

3) The species on the verge of becoming extinct is called as _____.
   a) Endangered b) Vamuable
   c) Rare d) Endemic

4) Presence of three anthers is a distinguishing feature of family _____.
   a) Orchidaceae b) Ranunculacea
   c) Rosale d) Plumbagenaceae

5) The species which are restricted to particular region are called as _____.
   a) Rare b) Endemic
   c) Vamuable d) Extinct

6) _____ among the following is one of the method of in-situ conservation.
   a) National park b) Botanical garden
   c) Gene bank d) Seed bank

7) _____ is one of the biotechnological methods to conserve the plants.
   a) Embryo culture b) Gene bank
   c) Seed bank d) Field gene bank

8) _____ is the lowest category of plant classification.
   a) Species b) Kingdom
   c) Order d) Family

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

1) The place where collection of dried plant specimans are stored called as _____.
2) In citations names of more than two authors are joined together by using _____.
3) Arrangement of leaves on stem called as _____.
4) Verticillaster inflorescence is character of family _____.

Q.2 Answer the followings (any 6) **12**

a) Phylogenetic system of classification.
b) Write a note on vegetative and reproductive characters use for identification of plants.
c) Describe alpha, beta and omega taxonomy.
d) Write a note on Botanical gardens.
e) Define Taxonomy.
f) Define Numerical taxonomy with example.
g) Define in situ conservation.
h) Write any 4 types of inflorescence.

Q.3 Answer the followings. (any 3) **12**

a) Define taxonomy and add a note on aims & principles of taxonomy.
b) Describe Bessays system of classification.
c) What is biodiversity? Describe ex situ methods of conservation.
d) Give morphological characters of family Orchidaceae.

Q.4 Answer the followings. (any 2) **12**

a) Write a note on morphological characters of family Lamiaceae.
b) Write a note on principles of ICBN.
c) Describe morphological characters of family Meliaceae.

Q.5 Answer the followings. (any 2) **12**

a) Write a note on morphological characters of family Fabaceae.
b) Write a note on species concept.
c) Describe the process of herbarium preparation.

SLR-ED-3

Seat No.		Set	P

M.Sc. (Semester - I) (New) (NEP CBCS) Examination: Oct/Nov-2023
BOTANY
Plant Growth and development (2314107)

Day & Date: Tuesday, 09-01-2024 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

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

Q.1 A) Choose correct alternative from the following **08**

1) During fruit ripening _____ increases.
   a) Carbohydrates b) Proteins
   c) Polyamines d) All

2) _____ shows auxins are present in apical regions.
   a) Bending of root towards sky
   b) Bending of leaves towards sky
   c) Bending of leaves towards light
   d) Bending of hypocotyls towards light

3) Salicylic acids are _____.
   a) Plant hormone regulating immunity
   b) Plant hormone causing growth
   c) Growth retardants
   d) Growth retardant which reduces growth

4) Which of the following method used to delay onset of spoilage on storage?
   a) Spry
   b) Fumigation
   c) Spry/deep in water/wax formulation/fumigation
   d) Wax treatment

5) The ideal packing material for high pressure processing of fruits is _____.
   a) Glass b) Flexible pouches
   c) Metal d) Trays

6) The main purpose of blenching before vegetable freezing is _____.
   a) Increase colour
   b) Soften tissue
   c) Deactivation of enzymes
   d) Avoid loss of vit C

7) The growth involves _____
   a) Cell division b) Cell elongation
   c) Cell maturation d) All the above

8) Auxanometer is used for detection of _____.
   a) Respiration b) Growth
   c) Movement d) Chlorophyll

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

1) Gibberellins acids are isolated from _____.
2) Drawf plants can be made taller with the help of _____.
3) _____ hormone is useful to make RNA and proteins.
4) Relative length of day & light is called as _____.

Q.2 Answer the following. (any 6) **12**

a) Define growth.
b) Define photomorphogenesis.
c) Define plant growth regulators.
d) What is post-harvest technology?
e) What is programmed cell death?
f) Define Phytochrome.
g) Give any 4 physiological roles of Auxin.
h) Give any 4 physiological roles of ABA.

Q.3 Answer the following. (any 3) **12**

a) Define plant growth & describe role of phytochromes.
b) Describe post harvest technology for leafy vegetables.
c) Describe mechanism of action of salicylic acid.
d) Write a note on signalling in plants.

Q.4 Answer the followings. (any 2) **12**

a) Write a note on signalling mechanism of GA.
b) Write a note on biochemical changes during fruit ripening.
c) Describe role of CCC.

Q.5 Answer the followings. (any 2) **12**

a) Describe Mutants in Arabidopsis for flowering.
b) Write a note on leaf senescence.
c) Give discovery & mechanism of action of jasmonoides.

SLR-ED-4

Seat No.	

Set P

M.Sc. (Semester - I) (New) (NEP CBCS) Examination: Oct/Nov-2023
BOTANY
Herbal & Drug Technology (2314108)

Day & Date: Tuesday, 09-01-2024 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. (MCQ) **08**

1) Powder made by calcification is also known as _____.
   a) Churna b) Bhasma
   c) Pak d) Ghrita

2) The term Nutraceuticals was coined by _____.
   a) William Gerwick b) Met Chinol F
   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) Part II of GMP includes _____.
   a) SOP" S b) Distribution
   c) Medical service d) Advertisement

5) Indian Ginseng is _____.
   a) Ginseng b) Sarpgandha
   c) Chicory d) Ashwgandha

6) Unani system of herbal medicine originates from _____ culture.
   a) Greece b) Iran
   c) India d) China

7) Biological source of black pepper is _____.
   a) *Piper longum* b) *Piper nigrum*
   c) *Piper notatum* d) *Piper umbellatum*

8) Stress testing is done for _____.
   a) To determine stability
   b) To determine shelf life
   c) To establish degradation pathway
   d) None of these

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

1) Phytosomes are also known as _____.
2) DTAB Stands for _____.
3) The finished goods storage area should be marked as _____.
4) Prebiotics are _____.

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

a) Explain the term biopiracy.
b) Enlist the examples of anti-aging herbs.
c) Write down the basic principle of GMP.
d) What is the traditional knowledge?
e) Write down the advantages of excipients.
f) Give the application of Spirulina.
g) Write down the steps included in secondary processing of herbal drugs.
h) What is the trade of medicinal plants in India?

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

a) Explain in brief good agricultural practices in cultivation of medicinal plants.
b) Write down the sources and uses of Indian gooseberry.
c) Write down the present scope of herbal industry.
d) Add a note on Bioprospecting.

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

a) Write down in detailed about Dandruff treatment by herbal drugs.
b) Describe in detailed about raw material in herbal drug industry.
c) What is IPR? Give its types and explain in detail about it.

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

a) Describe in detail sources and description of diluents and viscosity builders.
b) Define pest. Give the various methods of pest control.
c) What is Nutraceuticals? Write down the Health benefits and sources of Ginger and Fenugreek.

SLR-ED-6

Seat No.		Set	P

M.Sc. (Semester - I) (New) (NEP CBCS) Examination: Oct/Nov-2023
BOTANY
Research Methodology (2314103)

Day & Date: Thursday, 11-01-2024 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Draw neat and labelled sketches whenever necessary.
3) Figures to right indicate full marks.

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

1) The _____ is a set of observed data is equal to the sum of the numerical values of each observation, divided by the total number of observations.
   a) Mean b) Mode
   c) Median d) Variance

2) _____ data is original because it is collected by the investigator for the first time.
   a) Primary b) Secondary
   c) Tertiary d) Quaternary

3) The term ANOVA was first proposed by _____.
   a) Karl Pearson b) W S Gooset
   c) R.A. Fisher d) Simpson and Kafka

4) _____ is the square of standard deviations.
   a) Variance b) Student t test
   c) Chi square test d) Arithmetic mean

5) _____ is the ratio of standard deviation to arithmetic mean.
   a) Student t test b) Coefficient of variation
   c) Chi square test d) Arithmetic mean

6) Trade Mark is registered under _____ which provides Trade mark owner the right to sue for damages when infringements of Trade Mark occur.
   a) Trade Mark Act 1989 b) Trade Mark Act 1999
   c) Trade Mark Act 1975 d) Trade Mark Act 1988

7) _____ is eligible for copyright.
   a) Logo b) Brand Names
   c) Books d) Recipes

8) How long is the term of Patent?
   a) 20 b) 25
   c) 10 d) 15

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

1) Music comes under copyright.
2) In patent invention must be New.
3) Alphonso Mango is example of copyright.
4) Data collected by interview is primary data

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

a) Characteristics of a good research report
b) Write functions of trademark.
c) Rights of copyright owner
d) Characteristics of patent
e) What is WIPO?
f) Enlist any four GI plants.
g) Write meaning of research.
h) What is secondary data?

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

a) Explain types of research.
b) Describe criteria of good research.
c) Describe fully the techniques of defining a research problem.
d) What is Chi-square text? Explain its significance in statistical analysis.

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

a) What is ISBN? Write note on it.
b) What is h-index? Write note on determination of h-index.
c) Explain the meaning and significance of a Research design.

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

a) What is impact factor? Discuss in details calculation of impact factor.
b) Give an account on computer and internet application in research.
c) Describe in brief Variance and correlation.

SLR-ED-7

Seat No.		Set	P

M.Sc. (Semester - I) (Old) (CBCS) Examination: Oct/Nov-2023
BOTANY
Biology and Diversity of Fungi, Bacteria, Viruses and Lichens (MSC24101)

Day & Date: Friday, 05-01-2024 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. 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 marks.
4) Draw neat and labelled diagrams wherever necessary

Q.1 A) Choose the correct alternatives from the options. **10**

1) Lichens shows the symbiotic association between algae and _____.
   a) Bacteria b) Fungi
   c) Bacteriophage d) Viruses

2) The diseases occurring widely and periodically are termed as _____ diseases.
   a) Sporadic b) Endemic
   c) Epiphytotic d) None of these

3) Agaricus belongs to class _____.
   a) Myxomycetes b) Phycomycetes
   c) Ascomycetes d) Basidiomycetes

4) Find out correct sequence of sexual reproduction in fungi from following.
   a) Karyogamy-Plasmogamy- Meiosis
   b) Plasmogamy-Karyogamy-Meiosis
   c) Meiosis-Karyogamy-Plasmogamy
   d) all of these

5) Fungal cell wall is made up of _____.
   a) chitin b) peptidoglycan
   c) muramic acid d) none of these

6) Stemonites belongs to class _____.
   a) Oomycetes b) Myxomycetes
   c) Zygomycetes d) Teliomycetes

7) The protein coat of viruses that enclose the genetic material is called _____.
   a) Virion b) Capsid
   c) Peplomers d) Capsomers

8) Methanogens belongs to _____.
   a) Eubacteria b) Dinoflagellates
   c) Slime moulds d) Archaebacteria

9) The algal component of lichen thallus is called _____.
   a) Mycobiont b) Phycobiont
   c) Saprophyte d) Parasite

10) Somatogamy is the _____.
   a) Fusion of two gametes
   b) Fusion of two gametangia
   c) Fusion of vegetative cells
   d) Fusion of somatic cell and gamete

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

1) Heterothallism in fungi was discovered by _____.
2) Penicillin an antibiotic was first time discovered by _____.
3) Myxomycetes are commonly called _____.
4) *Parmelia* is the example of _____ lichens
5) Spherical shaped in bacteria is known as _____.
6) Fungi producing usually eight spores in a sac like structure belong to _____.

Q.2 Answer the followings. **16**

a) Explain Para sexuality in fungi.
b) Explain the role of fungi in food and Medicine.
c) Enlist any Four species of nitrogen fixing bacteria.
d) Enlist Characters of Viruses.

Q.3 Answer the followings.

a) Write causal organism of bacterial leaf spot of pomegranate, symptoms and management methods. **08**
b) Comment on “fungi as biocontrol agents” **08**

Q.4 Answer the followings.

a) What are lichens? Explain the structure of T.S of thallus of lichens. **08**
b) Explain the sexual reproduction in fungi. **08**

Q.5 Answer the followings.

a) Give the silent features of deuteromycetes. **08**
b) Describe the mode of asexual and sexual reproduction in Bacteria. **08**

Q.6 Answer the followings.

a) Explain ectomycorrhiza and endomycorrhiza with suitable example. **08**
b) Describe ultrastructure of bacterial cell. **08**

Q.7 Answer the followings.

a) Give the general characters of plectomycetes. **08**
b) Define spawn, explain the procedure for spawn making in mushroom cultivation. **08**

SLR-ED-8

Seat No.		Set	P

M.Sc. (Semester - I) (Old) (CBCS) Examination: Oct/Nov-2023
BOTANY
Biology and diversity of Algae, Bryophytes and Pteridophytes (MSC24102)

Day & Date: Sunday, 07-01-2024 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. 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 marks.
4) Draw neat and labelled diagrams wherever necessary.

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

1) In bryophytes spore mother cell is _____.
   a) Haploid b) Diploid
   c) Triploid d) Tetraploid

2) _____ among the following is ancestor of vascular plant.
   a) Asteroxylon b) Rhynia
   c) Rhodophyta d) Cyanophyta

3) Sporangia bearing leaf is called as _____.
   a) Sporophyll b) Sorus
   c) Ramentum d) Gamete

4) ____among the following is most economically important bryophyte.
   a) Sphagnum b) Riccia
   c) Funaria d) Marchantia

5) The arrangement of xylem & phloem is called as _____.
   a) Phyllotaxy b) Aestivation
   c) Stele d) Cambium

6) A culture obtained from strain of algal species is called as _____.
   a) Clonal b) Axenic
   c) Unialgal d) Enrichment

7) _____ among the following algae shows presence of coenobium habit.
   a) Spirogyra b) Volvox
   c) Ulva d) Codium

8) Stelar theory was proposed by _____.
   a) Druery b) Kashyap
   c) Van Tieghem & Douliot d) Johanson

9) Floridian starch is found in _____.
   a) Rhodophyceae b) Phaeophyceae
   c) Cyanophyceae d) Bacillariophyceae

10) In Marchantia asexual reproduction takes place by special structure called as_____.
   a) Sporangia b) Gemmae
   c) Zoospore d) Gametophyte

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

1) _____ shows presence of fertile spike.
2) Algal colony with definite number of cells & size called as _____.
3) Classification of bryophytes was proposed by _____.
4) _____ members of algae used to produce biofertilizers.
5) In Marchantia special structure present at dorsal side & helps in vegetative reproduction called as _____.
6) Red algae belongs to division _____.

Q.2 Answer the followings. **16**

a) General characters of algae.
b) Outline of classification system of bryophytes.
c) Characters of division Jungermaniales.
d) Describe unusual habitats of algae.

Q.3 Answer the followings.

a) Define phycology? Write a note on Thallus organization in algae. **08**
b) Write similarities & differences in class marchantiales & Sphgnels. **08**

Q.4 Answer the followings.

a) Write a note on general characters of bryophytes. **08**
b) Write a note on vegetative reproduction in algae. **08**

Q.5 Answer the followings.

a) Describe silent features of division cynophyceae. **08**
b) Write a note on economic importance of bryophytes. **08**

Q.6 Answer the followings.

a) Write a note on interrelationship between class lycopsida & Sphenopsida. **08**
b) Describe telome theory. **08**

Q.7 Answer the followings.

a) Write a note on stealer evolution in pteridophytes. **08**
b) Describe classification system of algae proposed by G.M. Smith. **08**

SLR-ED-9

Seat No.		Set	P

M.Sc. (Semester - I) (Old) (CBCS) Examination: Oct/Nov-2023
BOTANY
Plant Ecology (MSC24103)

Day & Date: Tuesday, 09-01-2024 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. 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 marks.

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

1) In ozonosphere, the sunlight ionizes _____ to ozone by photochemical dissociation.
   a) Nitrogen b) CO_2
   c) Oxygen d) Argon

2) Rhythmic activity of organism for food, shelter and reproduction is known as community _____.
   a) Periodicity b) Niche
   c) Dominant d) Stratification

3) Decrease in fertility of soil at rapid rate due to regular use of chemical fertilizers will lead to _____ pollution.
   a) Water b) Land
   c) Air d) Noise

4) _____ is a process of uptake of contaminants by plant roots and releasing them in gaseous state into the atmosphere.
   a) Phytovolatization b) Phytostabilization
   c) Phytoextraction d) Rhizofiltration

5) The total number of individuals in unit area at a given time is population _____.
   a) Natality b) Mortality
   c) Fluctuation d) Density

6) _____ is the abiotic component of ecosystem.
   a) Decomposers b) non-green plants
   c) Parasites d) Temperature

7) _____ is used to measure the stratospheric ozone from ground.
   a) Dobson spectrophotometer
   b) Calorimeter
   c) pH mete
   d) Thermometer

8) _____ is the example of Active Remote sensing.
   a) RADAR b) Camera
   c) Radiometer d) Spectrometer

9) Which convention is responsible for the framework for conservation and wise use of Wetlands?
   a) Doha b) Paris
   c) Stockholm d) Ramsar

10) _____ is done to see whether a project requires environmental clearance as per statutory notification.
   a) Scoping b) Screening
   c) impact prediction d) Public hearing

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

1) A sequence of organism that feed on one another, form a _____.
2) Increase or decrease in number of individuals in population is called as _____.
3) Tiny particles of solid or liquid in air which includes dust and dirt showing deleterious effect on human health is known as _____.
4) _____ gas is emitted naturally from the wetlands.
5) Outward migration of an individual from population is known as _____.
6) _____ takes place as chemicals transfer from lower trophic levels to higher trophic levels within a food web, resulting in a higher concentration in apex predators.

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

a) Define wetland according to Ramsar Convention and give the characteristics of Mangrove wetland.
b) Give the functions of Biosphere Reserve.
c) Explain qualitative characters of community.
d) Describe Rhizofiltration and Phytoextraction.

Q.3 Answer the following.

a) What is greenhouse effect and add a note on Greenhouse gases. **10**
b) What is remote sensing? Explain the different types of Remote sensing. **06**

Q.4 Answer the following.

a) Give the characteristics of population. **10**
b) Explain the models of succession. **06**

Q.5 Answer the following.

a) Give the abiotic and biotic components of marine ecosystem. **10**
b) What is pollution and explain the effects of air pollutants on vegetation. **06**

Q.6 Answer the following.

a) What is EIA? Explain different phases of EIA. **10**
b) Describe the mechanism of Phytostabilization and phytovolatilization. **06**

Q.7 Answer the following.

a) What is climate change and give its consequences. **10**
b) Explain synthetic characters of plant community. **06**

SLR-ED-10

Seat No.	

Set P

M.Sc. (Semester - I) (Old) (CBCS) Examination: Oct/Nov-2023
BOTANY
Taxonomy of Angiosperms (MSC24108)

Day & Date: Thursday, 11-01-2024 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No.1 and 2 are compulsory.
2) Attempt any Three questions from Q.No.3 to Q.No.7.
3) Figures to the right indicate full marks.

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

1) _____ is biotechnological method for ex-situ plant conservation which is applicable for long term storage of plant genetic material.
   a) Somatic embryogenesis b) Cryopreservation
   c) Organogenesis d) Plant tissue culture

2) _____ have defined the species of biosystematists in terms of gene exchange.
   a) Valentine & Love b) Bentham & Hooker
   c) Grant & Love d) Meyer & Pristely

3) Majority of the present day phylogenists consider angiosperms have first developed in _____.
   a) Temperate b) Moist tropics
   b) Artic d) Polar

4) If *Ficus krishnae* C. DC. is altered to the rank variety as *Ficus benghalensis* L. var. *krishnae* by Corner; what will be the correct citation for such taxon?
   a) *Ficus krishnae* C.DC. var. *benghalensis* (L.) Corner
   b) *Ficus benghalensis* L. var. *krishnae* (C. DC.) Corner
   c) *Ficus benghalensis* L. var. *krishnae* (L.) Corner
   d) *Ficus benghalensis* Corner, var. *krishnae* (L.) C. DC

5) Fruits of angiosperms are variously classified as _____.
   a) Simple or Compound b) Dry of Fleshy
   c) Dehiscent or Indehiscent d) All of these

6) If the specific epithet repeats exactly the generic name, then it is _____.
   a) Homonym b) Synonym
   c) Tautonym d) Superfluous name

7) An isotype is any duplicate of the _____.
   a) Lectotype b) Neotype
   c) Holotype d) None of the above

8) Presence of moniliform hairs on stamens is feature of family ____.
   a) Orchidaceae b) Commelinaceae
   c) Urticaceae d) Cyperaceae

9) ____ type of germination is supposed to be advanced in flowering plants.
   a) Hypogeal b) Epigeal
   c) Perigeal d) Syngeal

10) A floral formula does not represent _____.
   a) ovary position b) whorls of floral parts
   c) number of floral parts d) placentation and aestivation

Q.1 B) Fill in the blanks OR write true/false. **06**

1) The largest family in India is _____ (Orchidaceae)
2) When pollination is carried out by wind, it is called as ____ (Anemophily)
3) Genus *Grewia* is classified under the family _____ (Tiliaccae)
4) The alternative name of family Cruciferae _____ (Brassicaceae)
5) 'Flora of British India" is the work of _____ (Sir J. D. Hooker)
6) Urticaceae belongs to order _____ (Unisexuales)

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

a) What is species?
b) What is classical species concept?
c) What are biodiversity hotspots?
d) What is mean by endemism?

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

a) Comment upon:
   i) Synonyms and homonyms.
   ii) Effective and valid publications.
b) Comment upon:
   i) Citation of authority.
   ii) Rejection of names.

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

a) Explain in detail process of typification.
b) Explain in detail conservation strategies of biodiversity.

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

a) Comment upon:
   i) Aims of taxonomy.
   ii) Chemotaxonomy.
b) Comment upon:
   i) Distinguishing characters of Meliaceae.
   ii) Distinguishing characters of Commelinaceae.

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

a) Enlist merits & demerits of Bessey's system of classification.

b) Enlist merits & demerits of Cronquist's systems of classification.

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

a) Comment upon:

i) Vegetative characters of Tiliaceae.

ii) Reproductive characters of Tiliaceae.

b) Comment upon:

i) Vegetative characters of Bignoniaceae.

ii) Reproductive characters of Bignoniaceae.

SLR-ED-12

Seat No.		Set	P

M.Sc. (Semester - II) (New) (CBCS) Examination: Oct/Nov-2023
BOTANY
Biology and Diversity of Gymnosperms and Paleo Botany (MSC24201)

Day & Date: Monday, 18-12-2023 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

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

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

1) Horizontal pit pores is the characteristics of _____.
   a) *Podocarpus* b) *Araucaria*
   c) *Zamia* d) *Taxus*

2) Winged pollen grains are observed in _____.
   a) *Cuppressus* b) *Ginkgo*
   c) *Ephedra* d) *Podocarpus*

3) *Ginkgo*is considered one of the wonders of the world because, it is ____.
   a) Persisted with little change
   b) Living fossil
   c) Oldest and Persisted with little change
   d) Oldest

4) Coniferales have _____ wood.
   a) Manoxylic b) Polyxylic
   c) Pycnoxylic d) Monoxylic

5) Canada balsam is obtained from _____.
   a) *Cycas circinalis* b) *Abies balsamea*
   c) *Zamia floribunda* d) *Agathis purpurea*

6) Fusiform medullary rays are characterised by having _____.
   a) Sclerenchyma b) bars of sanio
   c) Protoxylem d) resin canals

7) The long form of R.L.S. is _____.
   a) Radial Longitudinal Section
   b) Reverse Longitudinal Section
   c) Regional Lengthwise Section
   d) Radially Long Section

8) *Rhipidopsis* is _____ genus of fossilized Ginkgoales.
   a) Leaf b) Stem
   c) Seed d) Flower

9) In *Medullosa thompsoni* _____ steles are present.
   a) 2 b) 3
   c) 23 d) 70

10) _____ is a stem genus.
   a) *Lyginopteris* b) *Kaloxylon*
   c) *Sphenopteris* d) *Lagenostoma*

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

1) In Botryopteris xylem of the petiole is _____ shaped.
2) *Sporogonites* belongs to _____ period.
3) *Nilssonia* is _____ genus of Cycadales.
4) *Thamnopterisbeiongs* to the family _____.
5) Pollen grain of pinus are_____.
6) Arucaria is member of Cycadaceae
   a) True b) Fales

Q.2 Answer the followings. **16**

a) Describe male cone of Ephedra
b) Describe male cone of Ginkgo
c) Describe female cone of Taxus
d) Describe male cone of Gnetum

Q.3 Answer the followings.

a) Describe diversity of gymnosperms with respect to Anatomy. **08**
b) Describe techniques used for fossil studies. **08**

Q.4 Answer the followings.

a) Justify how the Coniferales are economically important? **08**
b) Give general characters of family Rhyniaceae. **08**

Q.5 Answer the followings.

a) 'Describe reproductive structure of *Taxus.* **08**
b) Describe family Osmundaceae. **08**

Q.6 Answer the followings.

a) Reproductive structure of Benettitales. **08**
b) Kaloxylon Hookeri. **08**

Q.7 Answer the followings.

a) Male flower of *Arucaria* **08**
b) Male cone **08**

SLR-ED-13

Seat No.		Set	P

M.Sc. (Semester - II) (New) (CBCS) Examination: Oct/Nov-2023
BOTANY
Tools & Techniques in Botany (MSC24202)

Day & Date: Tuesday, 19-12-2023 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Q. N0. 1 and 2 are compulsory
2) Attempt any three questions from Q. No. 3 to Q. No. 7.
3) Figures to right indicate full marks.

Q.1 A) Choose correct Alternative. **10**

1) _____ is used for preservation of root tips.
   a) Alcohol b) Acetoalcohol
   c) Cotton blue d) Chloroform

2) _____ is the third step in herbarium preparation.
   a) Pressing b) Poisioning
   c) Collection d) Pasting

3) Centrifugation is dependent upon _____.
   a) Density of partical b) Volume
   c) Both a & b d) Colour

4) Horizontal electrophoresis is used for _____.
   a) Detection of DNA b) Detection of RNA
   c) Detection of proteins d) Detection of enzymes

5) _____actual size of herbarium sheet.
   a) 27x20 cm b) 29x42 cm
   c) 16x32 cm d) 22x22 cm

6) In scanning electron micrography _____ is used.
   a) Beam of light b) Beam of electron
   c) Beam of radiation d) None

7) PH Stands for _____.
   a) Negative logarithum of Hydrogen ion cone
   b) Positive logarithum Hydrolic acid
   c) Polyphenols
   d) Ethyl acetate

8) PPM stands for_____.
   a) Parts per million b) Partial million
   c) Poly phenyl malate d) None

9) _____ is used to stain chromosomes.
   a) Safranin b) Cotton blue
   c) Acetocarmine d) All the above

10) TEM is used to detect _____.
   a) Outer structure b) Inner structure
   c) Cytoplasm d) Outer layer

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

1) HPLC stands for _____.
2) Object scanning takes place by using _____ microscope.
3) BLAST stands for _____.
4) NCBI Stands for _____.
5) In liquid chromatography solute is _____ in state.
6) Basic PH means _____.

Q.2 Answer the followings. **16**

a) Write a note on FLAST.
b) Write a note on density gradient centrifugation.
c) Write a note on chromatography.
d) Write a note on fixatives & stains.

Q.3 Answer the followings. **16**

a) Write principle, working & applications of NMR.
b) Write a note on affinity chromatography.

Q.4 Answer the followings. **16**

a) What is herbarium & write a note on steps involved.
b) Write principle, working & applications of ion exchange chromatography.

Q.5 Answer the followings. **16**

a) Describe role of bioinformatics.
b) Write note on coefficient of variation.

Q.6 Answer the followings. **16**

a) Write principle, working & applications of gel electrophoresis.
b) Write a note on Transmission Electron Microscopy.

Q.7 Answer the followings. **16**

a) Write a note on photomicrograph.
b) Write working & applications of ultracentifuge.

SLR-ED-14

Seat No.	

Set P

M.Sc. (Semester - II) (New) (CBCS) Examination: Oct/Nov-2023
BOTANY
Cell and Molecular Biology (MSC24203)

Day & Date: Wednesday, 20-12-2023 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

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

Q.1 A) Fill in the blanks by choosing correct alternatives given below. 10

1) Plasma membrane is made up of _____.
   a) A protein, a lipid and a cellulose layer
   b) Bimolecular lipid layer surrounded by protein layers
   c) A protein layer between two lipid layers
   d) A lipid layer between two protein layers

2) The sodium pump is _____.
   a) Exchanges extracellular Na+ for intracellular K+
   b) Is an ion channel
   c) Is important for maintaining a constant cell volume
   d) Can only be inhibited by metabolic poisons

3) Nicotinic acetylcholine receptor is an example of _____.
   a) Ligated gated receptor channel
   b) Serpentine receptors
   c) Adhesion receptors
   d) Receptor enzymes

4) _____discovered plasmodesmata.
   a) Strasburger b) Boveri
   c) J Rhodin d) Van Beneden

5) Extranuclear DNA in plant is found in _____.
   a) Ribosome b) Chloroplast
   c) Golgi apparatus d) endoplasmic reticulum

6) Mt DNA is _____.
   a) Simple single stranded circular DNA molecule
   b) Simple double stranded circular DNA molecule
   c) Simple double stranded linear DNA molecule
   d) Simple single stranded linear DNA molecule

7) Nucleosome is made up of _____.
   a) DNA, histone core protein
   b) DNA, histone core protein, linker H1
   c) RNA, histone core protein
   d) RNA, histone core protein, linker H1

8) DNA replication is _____.
   a) Conservative b) Dispersive
   c) Semi-conservative d) Discontinuous

9) A point mutation that replaces a purine with another purine, or a pyrimidine with another pyrimidine _____.
   a) Nonsense mutation b) Silent mutation
   c) Transition mutation d) Transversion

10) _____technique used to detect and locate a specific DNA sequence on a chromosome.
   a) Electrophoresis b) FISH
   c) Immuno d) HPLC

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

1) Satellite DNA is found in _____.
2) _____ number of possible genetic code are present.
3) Microtubules are composed of the subunits of a protein called _____.
4) _____endoplasmic reticulum does not have ribosomes.
5) During cell division, the process division of cytoplasm of a parental cell into two daughter cells is called _____.

Q.2 Answer the followings. **16**

a) Write a note on the role of plasmodesmata in the movement of molecules.
b) Give an account on genome organization in chloroplast.
c) Describe mini and micro satellite DNA.
d) Describe structure and function of microfilaments.

Q.3 Answer the followings. **16**

a) Give a detailed account on models of plasma membrane and function.
b) Describe the genome organization in mitochondria.

Q.4 Answer the followings. **16**

a) Explain in detail the ultrastructure of Chloroplast.
b) Describe in details the transporters in mitochondria.

Q.5 Answer the followings. **16**

a) Explain different DNA repair mechanism.
b) Explain methods of detection of mini and micro satellite with its functions.

Q.6 Answer the followings. **16**

a) Explain in detail the properties of genetic code.
b) Describe the structure and function of microtubules.

Q.7 Answer the followings. **16**

a) Explain GISH in *situ* hybridization in detail.
b) Write a note on confocal microscopy with its applications.

SLR-ED-15

Seat No.	

Set P

M.Sc. (Semester - III) (New) (CBCS) Examination: Oct/Nov-2023
BOTANY
Plant Embryology and Palynology (MSC24301)

Day & Date: Friday, 05-01-2024 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Q. Nos. 1 and 2 are compulsory
2) Attempt any three questions from Q. No. 3 to Q. No. 7
3) Draw neat and labelled diagrams wherever necessary.
4) Figures to right indicate full marks.

Q.1 A) Choose correct Alternative from the following. **10**

1) Male gametophyte in angiosperms is shed as_____.
   a) Four celled pollen grain
   b) anther
   c) Microspore mother cell
   d) three celled pollen grain

2) The first polyembryony was reported by_____.
   a) Maheshwari b) Antoni van Leeuwenhoek
   c) Johari d) Swamy

3) _____ is a type of allergy triggered by pollen from different plants.
   a) Malaria b) Yellow fever
   c) Hay fever d) Dengue

4) The study related to the various aspects of the palynology of honeys and related substances is_____.
   a) Aeropalynolgy b) Stenopalynology
   c) Melittopalynology d) None of them

5) The branch which deals with study of pollen grain is_____.
   a) Cytology b) Palynology
   c) Genetics d) Paleobotany

6) In angiosperms development of male gametophyte from microspore is known as_____.
   a) Microsporogenesis b) Megasporogenesis
   c) Microgametogenesis d) Megagametogenesis

7) The term Palynology has been coined for the first time by _____.
   a) Hyde and Williams b) P.K.K. Nair
   c) G. Eradtman d) None of the above

8) The outer wall of the pollen is composed of _____.
   a) Lignin b) Cutin
   c) Sporopollenin d) Suberin

9) Development of microspore within another is known as _____.
   a) Microsporogenesis b) Megasporogenesis
   c) Microgametogenesis d) Spermatogenesis

10) _____ is a reproductive mechanism that bypasses the process of sexual reproduction.
   a) Apomixis b) Fertilization
   c) Plasmogamy d) None of the above

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

1) The first polyembryony was reported in orange seeds by Antoni van Leeuwenhoek in.
2) Honey is truly an insect product.
3) Compound pollen grains are found in Drosera.
4) The outer wall of pollen grain is composed of pectinous substance called pollenin.
5) All pollen grains have smooth exine.
6) In tissue culture autoclave is used for dry sterilization.

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

a) Define polyembryony with causes.
b) Define Apospory with suitable example.
c) What is tapetum?
d) What is Melittopalynology?

Q.3 Answer the following.

a) Significance of pollen pistil interaction **06**
b) Aeropalynology. **10**

Q.4 Answer the following.

a) Abnormal male gametophyte and their feature. **06**
b) Agropalynology. **10**

Q.5 Answer the following.

a) Describe the methods to overcome sexual incompatibility. **08**
b) What are the causes of apomixes. **08**

Q.6 Answer the following.

a) Describe in brief embryo culture. **06**
b) Palyno-taxonomy **10**

Q.7 Answer the following.

a) What is polyembryony? Write detail Classification of polyembryony. **08**
b) Describe brief outline of ultra structure of male gametophyte. **08**

SLR-ED-16

Seat No.		Set	P

M.Sc. (Semester - III) (New) (CBCS) Examination: Oct/Nov-2023
BOTANY
Cytogenetics and Crop Improvement (MSC24302)

Day & Date: Sunday, 07-01-2024 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Q. 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 marks.

Q.1 A) Multiple choice questions **10**

1) Literary work is the example of _____.
   a) Copyright b) Trade Mark
   c) Patent d) Trade Secret

2) _____ is used to search the similar sequence against a variety of different sequence.
   a) BLAST b) PubMed
   c) Protein Data Bank d) GenBank

3) _____ model is accounted for heteroduplex formation and gene conversion during recombination.
   a) Watson b) Crick
   c) Holliday d) Louis

4) Linkage map and genetic map are constructed on the basis of _____.
   a) Protoplasmic fusion b) Crossing over
   c) Hybridization d) Cybridization

5) _____ is a graphic analysis tool to detect a portion of a DNA molecule that when translated into amino acid contains no stop codon.
   a) Entrez b) Sequin
   c) Bankit d) ORF finder

6) _____ are the region of DNA at the end of the linear eukaryotic chromosome that are required for the replication and stability of chromosome.
   a) Centromere b) Chiasma
   c) Kinetochore d) Telomere

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) Isomer d) Polymer

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

10) In hybridoma technology, hybrid cells are selected in _____.
   a) MS medium b) HAT medium
   c) x-gal medium d) Whites medium

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

1) The eukaryotic chromosomes has packaging proteins called as _____ to condense the DNA molecule to maintain its integrity.

2) In _____ process the two DNA molecules exchange genetic information, resulting in the production of a new combination of alleles.

3) _____ is a gene or DNA sequence with known location on a chromosome that is used to identify the species.

4) The Variation observed in the plants regenerated from gametic cultures is known as _____.

5) _____ is used to submit and update the new multiple genomic sequences to NCBI.

6) Duration of Patent is for _____ years.

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

a) Explain the different types of crossing over.
b) Give the Importance of IPR.
c) What is Somaclonal Variation?
d) Explain about PDB (Protein Data Bank)

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

a) Explain the Mechanism of Recombination.
b) Give the different types of BLAST.

Q.4 Answer the following.

a) Explain the Domains of IPR. **16**
b) Write a note on Somatic Hybridization Technique.

Q.5 Answer the following.

a) Explain the Tools of NCBI. **16**
b) Write a note on Gene Conversion.

Q.6 Answer the following.

a) Explain the Gene Families. **16**
b) What is the role of Rec A and Rec B, C, D enzymes in recombination.

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

a) Give the structure and organization of the gene in Bacteria and Eukaryotes.
b) What are the general features of Somaclonal Variations and add a note on advantages and disadvantages of Somaclonal variations.

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Seat No.	

Set P

M.Sc. (Semester - III) (New) (CBCS) Examination: Oct/Nov-2023
BOTANY
Advances in Plant Metaboloism and Biochemistry (MSC24306)

Day & Date: Tuesday, 09-01-2024 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Q. Nos. 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7
3) Draw neat and labelled diagrams wherever necessary.
4) Figures to right indicate full marks.

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

1) Glycolysis takes place in _____.
   a) Mitochondria b) Ribosome
   c) Chloroplast d) Glyoxysomes

2) _____ is called as cyclic photophosphorylation.
   a) PSI I b) PSI II
   c) Cytochrome d) Plastoquinone

3) Secondary metabolites derived from _____.
   a) Tryptophan b) Alanine
   c) Cytocine d) None of these

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

5) _____ is first co2 acceptor in c4 cycle.
   a) OAA b) Glycolate
   c) PEP d) PGA

6) Photolysis occurs in _____.
   a) Photosystem I b) Photosystem II
   c) Photolysis III d) Photosystem IV

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

8) Secondary metabolites follows _____ pathway.
   a) ASA b) Shikimic acid
   c) Glycolate d) Phosphate

9) In CAM plants _____ acid stored during night.
   a) Phenolic b) Malic
   c) Benzoate d) All of these

10) Maize is _____.
   a) C3 plant b) C4 plant
   c) CAM plant d) SDP

B) True or False. **06**

1) ATP is Automatic transfer of photons
2) C3 plants shows kranz anotomy.
3) PEP is Phosphoenolpyruvate.
4) Photorespiration takes place in mitochondria.
5) Cystein is Sulphur containing amino acid.
6) Phosphate is Macronutrient

Q.2 Answer the followings. **16**

a) What is photorespiration?
b) Give outline of C3 cycle.
c) Define photosynthesis & its types.
d) Define secondary metabolites & enlist its types.

Q.3 Answer the followings.

a) Describe CAM pathway. **08**
b) Describe regulation of Rubisco. **08**

Q.4 Answer the followings.

a) Describe role of malic acid. **08**
b) Describe Sulphur metabolism. **08**

Q.5 Answer the followings.

a) Describe biosynthesis of aromatic amino acids. **08**
b) Write a difference in c3 & c4 plants. **08**

Q.6 Answer the followings.

a) Describe process of glycolysis. **08**
b) Describe photorespiration and its significance. **08**

Q.7 Answer the followings.

a) Describe electron transport chain. **08**
b) Describe ultra structure of chloroplast. **08**

SLR-ED-18

Seat No.		Set	P

M.Sc. (Semester - III) (New) (CBCS) Examination: Oct/Nov-2023
BOTANY
Angiosperm Systematics (MSC24307)

Day & Date: Tuesday, 09-01-2024 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Q. 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 marks.

Q.1 A) Choose correct alternative. (MCQ) **10**

1) The Bentham and Hooker considered family Boraginaceae and Convolvulaceae are closely related to family _____.
   a) Verbenaceae b) Scrophulariaceae
   c) Bignoneacee d) Solanaceae

2) _____ is largest Herbaria of world which includes over 6 lakhs herbarium specimens.
   a) Royal Botanic Garden, Edinburgh
   b) New York Botanical Garden
   c) Pusa, Italy
   d) Royal Botanic Garden, Kew

3) Threatened animals and plants are placed in a separate care unit for protection it is called _____.
   a) Ex-situ conservation b) In-situ conservation
   c) Wildlife sanctuary d) National Park

4) Which of the following is mangrove plant?
   a) *Sonneratia alba* b) *Catharanthus roseus*
   c) *Rosa indica* d) *Azadirachta indica*

5) IAPT Website contains _____.
   a) Plant list b) Official Journal
   c) Floristic Information d) All Floras

6) Syngnesious anthers and capitulum type of inflorescence are found in ____.
   a) Liliaceae b) Malvaceae
   c) Asteraceae d) Solanaceae

7) The ending for a name of order has been recommended as _____.
   a) -phyta b) -ales
   c) -aceae d) -inenae

8) A monograph mainly consists of information of _____.
   a) One taxon b) One Family
   c) One genus d) All of the above

9) The sub class polypetalaeinclude _____ numbers of series in Bentham and Hooker classification system.
   a) 2 b) 3
   c) 4 d) 5

10) The systematics deals with the _____.
   a) Identification of organism
   b) Classification of organism
   c) The kind of diversity of all
   d) Identification, naming and classification of both plants and animals.

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

1) In APG III system of classification the _____ order considered as primitive.
2) The India consists _____ Phytogeographical regions.
3) _____ is the lowest rank considered among the taxonomic hierarchy in taxonomic literature.
4) _____ is the one of the hotspotof biodiversity in India.
5) The family Solanaceae belongs to the series _____.
6) The size of standard herbarium sheet is _____.

Q.2 Answer the followings. **16**

a) Write a note on BSI.
b) Describe the term phyllotaxy and give it's types.
c) Describe the series Heteromerae.
d) Write a note on major categories in hierarchical classification.

Q.3 Answer the followings.

a) Explain the importance of the biodiversity. **08**
b) Describe the series Thalamiflorae with any one example. **08**

Q.4 Answer the followings.

a) What is general biological Principle? Explain it with Suitable example. **08**
b) Describe in brief Bentham Hooker's system of classification. **08**

Q.5 Answer the followings.

a) Explain various morphological features used in identification. **08**
b) Write a note on seed bank. **08**

Q.6 Answer the followings.

a) Write a note on any four wild ornamental Plants. **08**
b) Give an account on pre-Darwinion systems of classification. **08**

Q.7 Answer the followings.

a) Describe the series Infereae with giving one example. **08**
b) Give an account on endemism in western ghat. **08**

SLR-ED-21

Seat No.		Set	P

M.Sc. (Semester - IV) (New) (CBCS) Examination: Oct/Nov-2023
BOTANY
Phytogeography and Conservation Biology (MSC24401)

Day & Date: Monday, 18-12-2023 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. 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 marks.

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

1) _____ among the following is one of the method of ex situ conservation.
   a) National park b) Botanical garden
   c) Biotechnological methods d) All the above

2) Riedely endemism concept was dependent on _____.
   a) Geography b) Endemism
   c) Rare plants d) Huge plants

3) Eastern Himalaya shows presence of _____ type vegetation
   a) Alpine b) Tropical
   c) Temperate d) All the above

4) Flora of eastern Himalaya is divided in to _____ zones.
   a) 1 b) 2
   c) 3 d) 4

5) Indus Plain shows presence of _____ region.
   a) Malbar b) Panjab
   c) Delhi d) Mumbai

6) J.D. Hooker divides India in to _____ regions.
   a) 10 b) 16
   c) 9 d) 8

7) Forest conservation act is made for _____.
   a) Conservation of plant b) Conservation of birds
   c) Conservation of animals d) Conservation of tigers

8) _____ among the following is the role of NGO in conservation.
   a) To guide the peoples b) Taking workshops & conferences
   c) Train the students d) All the above

9) _____ among the following shows diversity in flora & fauna.
   a) Rajasthan b) Eastern Himalaya
   c) Western ghat d) Both b & c

10) _____ is one of the example of endemic distribution.
a) *Pongamia* b) *Ginkgo biloba*
c) *Rosa damescena* d) *Cassia tora*

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

1) C.B. Clarke divides phytogeographic region of India in to _____.
2) International biodiversity act is made in _____.
3) In flora of Eastern Himalaya _____ family is dominant.
4) Phytogeography define as _____.
5) If range of same plant is broken by physiological barriers then it is called as _____.
6) Storage of seed in liquid nitrogen is called as _____.

Q.2 Answer the followings. **16**

a) Write a note on Phytogeography & continental drift
b) Write a note on wildlife conservation act.
c) Vegetation of Alpine region of western Himalaya.
d) Describe Phytogeography and its types

Q.3 Answer the followings. **16**

a) Mangrove vegetation of India.
b) Write a note on Biotechnological method of conservation.

Q.4 Answer the followings. **16**

a) Describe Flora of eastern Himalaya.
b) Write a note on importance of Biodiversity.

Q.5 Answer the followings. **16**

a) Describe flora of Delhi.
b) Describe endemism in detail.

Q.6 Answer the followings. **16**

a) Phytogeographical regions of India according to Prain & Burkill.
b) Describe national parks.

Q.7 Answer the followings. **16**

a) Describe in detail in situ conservation.
b) Describe Western Ghat vegetation.

SLR-ED-22

Seat No.		Set	P

M.Sc. (Semester - IV) (New) (CBCS) Examination: Oct/Nov-2023
BOTANY
Plant Tissue Culture Greenhouse Technology and Hydroponics (MSC24402)

Day & Date: Tuesday, 19-12-2023 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

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

Q.1 A) Multiple choice question. **10**

1) Pollen embryoids were discovered by _____.
   a) Konal and Natraja b) Guha and Maheshwari
   c) Skoog and Miller d) Helperin and Wetherell

2) Differentiation of callus into plant parts is known as _____.
   a) Embryogenesis b) Morphogenesis
   c) Embryoid formation d) Totipotency

3) Which of the following is an auxin?
   a) IAA b) BAP
   c) Kn d) Zeatin

4) In general, callus cultures are subcultured after which of the following period?
   a) 4-6 Days b) 4-6 Weeks
   c) 8-10 Weeks d) 2-3 Months

5) In suspension cultures elicitation can be done by _____.
   a) Chitin b) Pectin
   c) U. V. light d) All of these

6) Controlled release fertilizer “Osmocote” consists of _____.
   a) Fertilizers and resin b) Fertilizers and gum
   c) Fertilizers and tannin d) Fertilizers and mucilage

7) Which country has developed advanced hydroponics technology due to its arid climate?
   a) Sri Lanka b) UAE
   c) USA d) Israel

8) The structures employed by P. R. White for first successful tissue culture were _____.
   a) Tomato roots b) Tomato leaves
   c) Tomato shoots d) All of these

9) In greenhouse, the heat treatment is given to soil to remove used seeds at the temperature _____.
   a) 60 °C b) 82.2 °C
   c) 37.8 °C d) 54.4 °C

10) A plant raised from a single pollen grain under cultural conditions would be _____.
   a) Haploid b) Dihapliod
   c) Diploid d) None of these

B) Fill in the blanks / Write true or false. **06**

1) Application of embryo culture is Overcoming hybridization barrier
2) Sodium and potassium alginate hydrogels have been used for encapsulation of hydrated somatic embryos?
3) In synthetic plastic aggregate, media consists of Urea-formaldehyde foam
4) Zeatin is thermo stable.
5) Autoclave is dry method of sterilization
6) Perlite is used in hydroponics.

Q.2 Answer the followings. **16**

a) Enlist physical methods of sterilization
b) What is micropropagation
c) Enlist types of media used in tissue culture
d) What is somatic hybridization

Q.3 Answer the followings.

a) Write a note on factors affecting anther culture. **08**
b) Describe in detail steps involved in Anther culture. **08**

Q.4 Answer the followings.

a) Factors influencing morphogenesis. **08**
b) Advantages of anther culture. **08**

Q.5 Answer the followings.

a) Construction of greenhouse **08**
b) Write a note on role of biotechnology in agriculture. **08**

Q.6 Answer the followings.

a) Describe in brief tissue culture laboratory. **08**
b) Describe in detail protoplast isolation. **08**

Q.7 Answer the followings.

a) Fertilizers in greenhouses **08**
b) Describe in detail somatic embryogenesis and its applications **08**

SLR-ED-23

Seat No.		Set	P

M.Sc. (Semester - IV) (New) (CBCS) Examination: Oct/Nov-2023
BOTANY
Environmental Plant Physiology (MSC24405)

Day & Date: Wednesday, 20-12-2023 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. 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 marks.

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

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

2) $CaSO_4$ is used for reclamation of _____ soil.
   a) Acidic b) Alkaline
   c) Saline d) Marshy

3) Disease occurs in the plants when the pathogen lacks.
   a) R genes b) avr genes
   c) DIR1 genes d) None of these

4) Depletion of ozone increases the amount of ____ radiations reaching the globe.
   a) Visible b) UV
   c) IR d) Gamma

5) Cell membranes of plants resistant to chilling injury contain _____ fatty acid sin their lipid bilayer.
   a) Saturated b) Long chain
   c) Unsaturated d) Short chain

6) SOD catalyzes the reduction of _____ in to hydrogen peroxide.
   a) Molecular oxygen b) Singlet oxygen
   c) Ozone d) Superoxide

7) Acid rain is caused by higher concentrations of in the ____ atmosphere.
   a) NO_xandSO_2 b) NO_2andO_3
   c) $SO_2$and O_3 d) CO_2andSO_2

8) _____ is a halophyte.
   a) *Suaeda* b) Sugar beet
   c) Date palm d) Cotton

9) _____ is not a compatible solute.
   a) Proline b) Glycine-betaine
   c) Sorbitol d) Malic acid

10) _____ is a stress Hormone.
a) Ethylene b) Abscisic acid
c) GA d) Auxin

B) True or False **06**

1) Reduced or changed function of the plant in response to stress is called Biological strain.
2) Jasmonic acid biosynthesized from Linolenic acid.
3) Heat Shock proteins were first discovered in Arabidopsis.
4) Hypersensitive response in plants is preceded by accumulation of NO and oxidative burst.
5) Ice nucleation means formation of ice crystals around large polysaccharides and proteins in cell walls.
6) Biotic stress in plants is caused by bacterial, nematode and fungal pathogen.

Q.2 Answer the followings. **16**

a) Heat shock proteins
b) Impact of elevated CO_2 concentration on plants.
c) Define Biological strain? Explain its types with suitable example.
d) Compatible solutes

Q.3 Answer the followings. **16**

a) Effects of water stress son plant metabolism.
b) Write a note on mechanism of salt tolerance in higher plants.

Q.4 Answer the followings. **16**

a) Antioxidants in plants and their role.
b) Effects of flood and tolerance mechanism in plants.

Q.5 Answer the followings. **16**

a) Define Biotic stress? Describe in detail Hypersensitive response in plants during infection of pathogen.
b) Give an account of effect of salt stress on plant metabolism.

Q.6 Answer the followings. **16**

a) Effect of SO_2 and NO_2 on plant metabolism.
b) Describe the effects of heat stress on plant metabolism.

Q.7 Answer the followings. **16**

a) Explain in detail resistance mechanism against heavy metal stress in plants.
b) Describe frost injury and frost resistance in plants.

SLR-ED-24

Seat No.		Set	P

M.Sc. (Semester - IV) (New) (CBCS) Examination: Oct/Nov-2023
BOTANY
Modern trends in Angiosperm Taxonomy (MSC24406)

Day & Date: Wednesday, 20-12-2023 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. 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 marks.

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

1) Chemotaxonomy is based on _____.
   a) Chemical constituent of plant
   b) Cell structure
   c) Phylogeny
   d) Embryology

2) The secondary electrons radiated back in SEM is collected by _____.
   a) Specimen b) Anode
   c) Vacuum chamber d) Cathode

3) Who among the following popularized the use of embryological characters in taxonomy?
   a) Carl Linnaeus b) Panchanan Maheshwari
   c) Birbal Sahani d) Bentham and hooker

4) GIS stand for _____.
   a) Geographic information system
   b) Geographic internal system
   c) Global information system
   d) Global internal system

5) Red data book launched and maintained by _____.
   a) IUCN b) IZBN
   c) IBCN d) ICAR

6) How many minimum satellites are operational in the constellation of GPS?
   a) 25 b) 24
   c) 32 d) 28

7) Sieve tube plastids first identified by _____.
   a) Engler b) Bentham
   c) Darwin d) Behnke

8) When taxon has not yet been evaluated against the criteria, it is called as _____.
   a) Data deficient b) Not evaluated
   c) Least concern d) Near threatened

9) The tetrasporic type of embryo sac is found in _____.
   a) *Plumbago* b) *Aster*
   c) *Magnolia* d) *Acanthus*

10) The presence of digestive glands is the characteristics feature of _____ plant.
   a) *Magnolia* b) *Drosera*
   c) *Solanum* d) *Sesamum*

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

1) The highest number of chromosome among the whole plant group is recorded in _____ plant which is n=630.
2) The term Phenotic plasticity is also known as _____.
3) The principle of numerical taxonomy was developed by
4) _____ Plantgroup consists closed, conjoint, collateral types of vascular bundles.
5) Two main factors taken into account when measuring diversity are _____ and _____.
6) RFLP stands for _____.

Q.2 Answer the followings. **16**

a) Define palynotaxonomy. Give the pollen morphological characters in relation to taxonomy.
b) Give the advantages and disadvantages of cladistics.
c) Explain the principle of SEM?
d) Write a short note on biodiversity awareness programme.

Q.3 Answer the followings.

a) What is cytotaxonomy? Explain in the detail cytological characters in relation to taxonomy. **08**
b) Add a short note on: **08**
   i) Bar coding
   ii) GIS

Q.4 Answer the followings.

a) Give the brief account on systematic position of Hydatellaceae. **08**
b) Discuss in detail wood anatomy and its characteristics feature which are used in taxonomy. **08**

Q.5 Answer the followings.

a) Explain in brief concept of assessment of biodiversity? **08**
b) Describe in detail NPC system of pollen study and add a short note on Palynogram. **08**

Q.6 Answer the followings.

a) Explain in detail Polymerase chain reaction analysis with respect to molecular systematics. **08**
b) Describe in detail serology and taxonomy. Give the application of serological data in systematics. **08**

Q.7 Answer the followings.

a) What is red data book? Explain in brief the categories included in it with example. **08**

b) Explain in detail numerical taxonomy and give the advantages of numerical taxonomy. **08**

SLR-ED-25

Seat No.		Set	P

M.Sc. (Semester - IV) (New) (CBCS) Examination: Oct/Nov-2023
BOTANY
Crop Physiology (MSC24407)

Day & Date: Thursday, 21-12-2023 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. 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 marks.

Q.1 A) Choose correct Alternative. **10**

1) _____ among following macromolecule used in fertilizers for chlorophyll synthesis.
   a) N b) P
   c) Cl d) None

2) What is the critical period of DNP Plants?
   a) 8 hrs dark period b) 14-16 hrs dark period
   c) 8 hrs Light period d) 14-16 hrs light period

3) _____hormone is present in leaves for flowering in photoperiodism.
   a) Vernalin b) Phytochrome
   c) Florigen d) Phylogen

4) presence of ____ is important for flowering.
   a) Stem b) Branch
   c) Leaves d) Fruits

5) chilling treatment to seeds is called as _____.
   a) Phytochrome b) Physiology
   c) Vernilization d) None

6) The relative yield of plant increases when ____.
   a) Pr
   b) Pfr
   c) Simultaneous exposure of Pr & Pfr
   d) None

7) _____ are the basic forms of fertilizers.
   a) *Granule* b) *Powder*
   c) *Liquid* d) All the above

8) _____ among the following is nitrogen fertilizer.
   a) Sodium nitrate b) Ammonium sulphate
   c) Both a & b d) None

9) _____ amount of iron is required for plant growth.
   a) 0.5-5mg b) 10-20mg
   c) 30-40mg d) 50mg

10) The agent which kills unwanted weed is called as ____.
   a) Weedicide b) Herbicide
   c) Both a & b d) None

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

1) _____ hormone enhances flowering in plants.
2) The plants which require maximum light period for growth are called as_____.
3) The herbicides which are effective against large number of weeds are called as _____.
4) ____ hormone is responsible for flowering in vernalization.
5) Manganese sulphate is a type of _____ fertilizer.
6) ICRISAT stands for _____.

Q.2 Answer the followings. **16**

a) Write a note on fruit physiology of Ber
b) Describe IARIT
c) Write a note on Crop growth analysis
d) Mineral nutrition of groundnut

Q.3 Answer the followings.

a) Write a note on BARC **08**
b) Write a note on post harvest technology for grapes. **08**

Q.4 Answer the followings.

a) Write a note on Phloem transport. **08**
b) Write a note on weedicides. **08**

Q.5 Answer the followings.

a) Write a note on Biological fertilizers. **08**
b) Write a note on organic farming. **08**

Q.6 Answer the followings.

a) Write a note on antitranspirants. **08**
b) Write a note on foliar applications of fertilizers. **08**

Q.7 Answer the followings.

a) Physiology of Jowar. **08**
b) Write a note on CIMAP. **08**

SLR-ED-26

Seat No.		Set	P

M.Sc. (Semester - IV) (New) (CBCS) Examination: Oct/Nov-2023
BOTANY
Industrial Botany (MSC24408)

Day & Date: Thursday, 21-12-2023 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. 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 marks.

Q.1 A) Multiple choice question. **10**

1) Which of the following is used for agitation in a fermenter?
   a) Impeller b) Baffles
   c) Sparger d) Filter

2) Oil and gas are mainly derived from which of the following sources?
   a) Trees and larger plants
   b) Phytoplanktonic material found in marine basins
   c) Fresh water algae
   d) Dead animals

3) Which one of the following is not the objective of the business?
   a) Investment b) Innovation
   c) Creation of customers d) Profit- making

4) The main function of DIC is____
   a) To collect data on consumer items
   b) Identification of entrepreneurs
   c) To prepare model schemes
   d) To secure reservation of certain products for the SSIS

5) Which of the operation does not come under upstream processing?
   a) Media preparation b) Inoculums development
   c) Effluent treatment d) Storage of raw material

6) The protein content which is extracted from mixed or pure cultures of yeast, bacteria, algae and fungi is called _____.
   a) Triple cell protein b) Single cell protein
   c) Double cell protein d) Tetra cell protein

7) Insecticide obtained from neem plant is_____
   a) Pyrethrin b) Pyrethroid
   c) Thiocarbamate d) Azadirachtin

8) NABARD is associated with_____.
   a) Rural development b) Urban development
   c) Industrial development d) Development of railways

9) In CI engines with increase in compression ratio the delay period_____.
   a) Increases
   b) Decreases
   c) First increases and then decreases
   d) Not affected

10) Fossil fuels are rich in carbon and_____.
   a) Nitrogen b) Hydrogen
   c) Methane d) Oxygen

B) Fill in the blanks **06**

1) According to Mary parker_____ is an art of getting things done through others.
2) The common name of plerotus *sajor kaju* is_____
3) In penicillin production the p^H of culture medium is maintained between _____.
4) Buying and selling of manufacturing goods related to _____entrepreneur.
5) ____ chemical reaction makes biodiesel.
6) The term____ refers to the possibility of inadequate profits or even losses due to uncertainties or unexpected events.

Q.2 Answer the followings. **16**

a) Which sources are used in the production of vinegar and citric acid?
b) What are the different types of entrepreneur?
c) Explain the fundamentals of management.
d) Give the advantages of SCP.

Q.3 Answer the followings.

a) Explain *spirulina* mass cultivation and its applications in detail. **08**
b) Define biofuel and explain the alternatives for fossil fuel. **08**

Q.4 Answer the followings.

a) Explain the process of sugar to ethanol production. **08**
b) Define fermentation and explain fed -batch fermentation in detail. **08**

Q.5 Answer the followings.

a) Explain the sources and method of vinegar production. **08**
b) Describe the production of Button mushroom. **08**

Q.6 Answer the followings.

a) What are the characteristics and functions of entrepreneur? **08**
b) Describe the preparation of project report in detail. **08**

Q.7 Answer the followings.

a) What is the difference between business and profession? **08**
b) Define accounting and add a short note on profit and loss accounts. **08**