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**M.Sc. (Semester - I) (New) (CBCS) Examination: Oct/Nov - 2022
(BOTANY)**

Biology and Diversity of Fungi, Bacteria, Viruses and Lichens

Day & Date: Monday, 13-02-2023

Max. Marks: 80

Time: 03:00 PM To 06:00 PM

- Instructions:**
- i) Q. Nos. 1 and 2 are compulsory
 - ii) Attempt any three questions from Q. No. 3 to Q. No. 7
 - iii) Figures to right indicate full marks.
 - iv) Neat labeled diagrams must be drawn wherever necessary.

Q.1 A) Multiple Choice Question:

10

- 1) Penicillin was discovered by _____.
 a) A. F. Blakeslee b) Alexander Flemming
 c) Elie Metchnikoff d) Felix Dugardin
- 2) *Usnea* is a _____.
 a) Filamentous lichen b) Crustose lichen
 c) Fruticose lichen d) Foliose lichen
- 3) Which one of the following is asexual mode of reproduction in yeast?
 a) Budding b) Fragmentation
 c) Anisogamy d) Oogamy
- 4) Give the name of smut fungi of the following.
 a) *Melioa* b) *Ustilago*
 c) *Puccinia* d) *Agaricus*
- 5) When bacteria are rod shaped they are called as _____.
 a) Cocci b) Bacilli
 c) Spirilla d) Vibrio
- 6) Free living bacterium capable of fixing nitrogen is _____.
 a) *Rhizobium* b) *Azotobacter*
 c) *Pseudomonas* d) *Streptococcus*
- 7) Myxomycota fungi are also called as _____.
 a) True fungi b) imperfect fungi
 c) eumycota d) slime moulds
- 8) Coprophilous fungi grow on _____.
 a) Dung b) wood
 c) grasses d) leaf litter
- 9) Give the name of disease caused by *Synchytrium endobioticum*
 a) Wart of potato b) Black arm of potato
 c) Little leaf of brinjal d) None of these

- 10) The Viruses possess _____ enclosed within protein coat.
- a) DNA or RNA
 - b) DNA and RNA
 - c) DNA
 - d) RNA

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

- 1) The science of study of Fungi is known as _____.
- 2) The fungi which grow on dead or decaying organic matter are called _____.
- 3) Heterothallism was discovered by _____.
- 4) Sexual reproduction is absent in the members of the class _____.
- 5) Gibberellins a growth hormone is isolated from _____.
- 6) Round shaped bacteria are known as _____.

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

- a) Role of fungi in industry
- b) Nitrogen fixing bacteria
- c) Virus Ultra structure
- d) Salient features of class myxomycetes

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

- a) Describe in brief reproduction in fungi.
- b) Describe general characters and ultra structure of bacteria.

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

- a) Give account on Economic importance of viruses.
- b) Write brief an account of nutrition and reproduction in Bacteria.

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

- a) Explain various kinds of ascocarp (fruiting body) in Ascomycota.
- b) Describe isolation and purification of viruses.

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

- a) Describe the classification of fungi up to order level by Ainsworth's.
- b) Describe in brief distribution and forms of Lichen thalli.

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

- a) What is Mycorrhiza? Describe concepts and types of mycorrhizae.
- b) Describe in brief salient features of class Oomycetes and order peronosporales.

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**M.Sc. (Semester - I) (New) (CBCS) Examination: Oct/Nov - 2022
(BOTANY)**

Biology and Diversity of Algae, Bryophytes, and Pteridophytes

Day & Date: Tuesday, 14-02-2023
Time: 03:00 PM To 06:00 PM

Max. Marks: 80

- Instructions:** 1) Q. Nos. 1 and 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 correct alternative. 10

- 1) Which of the following algal divisions is characterized by possession of chlorophylls A and B, paramylon as the energy storage material, and the presence of a pellicle instead of a cell wall?
 - a) Chlorophyta
 - b) Euglenophyta
 - c) Pyrrophyta
 - d) Chrysophyta
- 2) Laminarin is an energy storage material characteristic of _____
 - a) Chlorophyta
 - b) Chrysophyta
 - c) Phaeophyta
 - d) Pyrrophyta
- 3) Chlamydomonas and Volvox are similar because _____
 - a) They are members of the Chlorophyta
 - b) They both are motile
 - c) Both a) and b)
 - d) None of these
- 4) Characteristics used to place algae into divisions include all of the following except _____.
 - a) Form of storage material
 - b) Flagella number and location
 - c) Accessor pigments used in photosynthesis
 - d) All of the above
- 5) In which of the following groups would you place a plant that produces spores, lacks seeds and has vascular tissue?
 - a) Bryophyte
 - b) Algae
 - c) Pteridophyte
 - d) Gymnosperm
- 6) In Pteridophytes, the dominant generation is _____.
 - a) Gametophytic
 - b) Haploid
 - c) Diploid
 - d) Triploid
- 7) Reduction division in pteridophytes occurs in _____.
 - a) Prothallus is formed
 - b) Gametes are formed
 - c) Spores are formed
 - d) Sex organs are formed

- 8) Prothallus represents _____
 a) Sporophytic phase in a fern
 b) Gametophytic phase in a fern
 c) Sporophytic phase in a gymnosperm
 d) Gametophytic phase in a gymnosperm
- 9) 'Club moss' belongs to _____
 a) Fungi
 b) Algae
 c) Bryophyta
 d) Pteridophyta
- 10) Number of layers in the Tapetum of Polypodium are: _____
 a) One
 b) Two
 c) Three
 d) Four

B) Fill in the blanks OR Write True/False.

06

1. Selaginella belongs to division _____.
2. One or two peripheral layers persist for the nourishment of the developing spores. These nourishing cells form: _____.
3. Phloem is without in _____ pteridophytes.
4. The protostele in which xylem core is star like is called: Actinostelele.
 a) True
 b) False
5. In siphonostele, two cylinders of vascular tissue are present in the stele he.: Polycyclic
 a) True
 b) False
6. In Xylem in which protoxylem is lying in the middle of Metaxylem is: Diarch
 a) True
 b) False

Q.2 Answer the followings.

16

- A) Comment upon reserve food material in algae.
- B) Enlist the characters of phytoplankton.
- C) Enlist the salient features of class- Xanthophyceae.
- D) Comment up briefly on telome concept.

Q.3 Answer the followings.

16

- A) Comment upon:
 - 1) Interrelationship of class Cyanophyceae
 - 2) Phylogeny of class Xanthophyceae
- B) Comment upon:
 - 1) Interrelationship of order- Jungermanniales
 - 2) Phylogeny of order- Marchantiales

Q.4 Answer the followings.

16

- A) Explain in detail stelar evolution in pteridophytes.
- B) Explain in detail current trends of research in Pteridophytes.

Q.5 Answer the followings.

16

- A) Comment upon:
 - 1) Interrelationship of class Bacillariophyceae
 - 2) Phylogeny of class Phaeophyceae

- B) Comment upon:
 - 1) Interrelationship of order - Funariales
 - 2) Phylogeny of order - Sphagnales

Q.6 Answer the following. 16

- A) Salient features of Bryophytes
- B) Salient features of Pteridophytes

Q.7 Answer the following. 16

- A) Comment upon:
 - 1) Interrelationship of class Psilopsida
 - 2) Phylogeny of class Sphenopsida
- B) Comment upon:
 - 1) Interrelationship of order - Anthocerotales
 - 2) Phylogeny of order - Buxbaumiales

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**M.Sc. (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022
(BOTANY)
Plant Ecology**

Day & Date: Wednesday, 15-02-2023
Time: 03:00 PM To 06:00 PM

Max. Marks: 80

- Instructions:** 1) Q. Nos. 1 and. 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 correct alternative.**10**

- 1) in ozonosphere, the sunlight ionize _____ to ozone by photochemical dissociation.
 - a) Nitrogen
 - b) CO₂
 - 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) Phytovolatilization
 - b) Phytostabilization
 - c) Phytoextraction
 - d) Rhizofiltration
- 5) The total number of individual 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 meter
 - 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**

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**M.Sc. (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022
(BOTANY)
Taxonomy of Angiosperms**

Day & Date: Thursday 16-02-2023
Time: 03:00 PM To 06:00 PM

Max. Marks: 80

- Instructions:** 1) Question 1 and 2 Compulsory.
2) Attempt any three from questions from 3 to question no 7.
3) Draw neat and labelled diagrams wherever necessary.
4) Figures to right indicates full marks.

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

- 1) _____ among the following is not an example of family Rutaceae.
 - a) *Aegle marmelos* b) *Feronia limonia*
 - 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) Varnuable
 - 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) Varnuable d) Extinct
- 6) _____ among the following is one of the primitive character.
 - a) Zygomorphic flower b) Presence of perianth
 - c) Numerous anthers d) Gamopetalous nature
- 7) Holotype is _____.
 - a) Plant material with its description
 - b) Plant material along with its citation
 - c) Plant material collected by the author
 - d) Plant material with flower
- 8) Presence of labellum is characteristic feature of family _____.
 - a) Sapotaceae b) Orchidaceae
 - c) Ranunculaceae d) Poaceae

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**M.Sc. (Semester - II) (New) (CBCS) Examination: Oct/Nov-2022
(BOTANY)**

Biology and Diversity of Gymnosperms and Paleobotany

Day & Date: Monday, 20-02-2023

Max. Marks: 80

Time: 11:00 AM To 02:00 PM

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

Q.1 a) Choose the correct answer from given alternative. 10

- 1) *Canada balsam* is obtained from _____.
 - a) *Cycas circinalis*
 - b) *Abies balsamea*
 - c) *Zamia basamea*
 - d) *Balsamina albus*
- 2) Wood of Conifers is _____.
 - a) Pycnoxylic
 - b) Monoxylic
 - c) Manoxylic
 - d) Diploxylic
- 3) In cupressoid pits, pit pores are _____.
 - a) Vertical
 - b) Rounded
 - c) Lense shaped and obliquely placed
 - d) Horizontal
- 4) Long form of T. L. S. is _____.
 - a) Tangential longitudinal section
 - b) Transverse longitudinal section
 - c) Transparent longitudinal section
 - d) Transparent long section
- 5) Fusiform medullary rays are characterized by the presence of _____.
 - a) Sclerenchyma
 - b) Resin canal
 - c) Parenchyma
 - d) Bars of sanio
- 6) The T. S. of stem of *Taxus* lacks _____.
 - a) Tannin cells
 - b) Parenchymatous cells
 - c) Resin canals
 - d) Mucilage canals
- 7) In Vascular bundles of *Ephedra*, xylem is composed of _____.
 - a) Only tracheids
 - b) Both tracheids and vessels
 - c) Only vessels
 - d) Medullary rays
- 8) In *Ginkgo biloba* _____ and _____ are two different types of branches of stem.
 - a) Primary & secondary
 - b) Primary & lateral
 - c) Young & mature
 - d) Long shoot & dwarf shoot
- 9) *Mazocarpon* is generic name of _____.
 - a) *Sigillarian* cone
 - b) *Lepidophyllum*
 - c) *Selaginella* cone
 - d) *Psilophyton* cone

- 10) Lycopods leaves measures 30 cm long & shows presence of _____ tissue.
- a) Epiblema
 - b) Cuticular
 - c) Transfusion
 - d) Hairy

b) Fill in the blanks-**06**

- i) Triangular portions in the leaf cushion is _____.
- ii) The first account of Psilophytales was given by _____.
- iii) Leaf cushion arrangement of stem of *Sigillaria* appears to be _____.
- iv) _____ is a stem genus.
- v) Coniferales have _____ type of stem
- vi) Arucarian pitting is seen in _____.

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

- a) What is compression?
- b) Describe Rhynia, minor.
- c) Describe Lepedocorpon.
- d) What are Coralloid roots?

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

- a) Explain Glossopteris flora.
- b) Explain salient features and phylogeny of Cycadales.

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

- a) Discuss salient feature and affinities of Taxales.
- b) Write briefly about the Paleaobotanical techniques for Petrification.

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

- a) Give economic importance of Gymnosperms.
- b) Give important features of Psilophytales.

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

- a) Salient features of Pteridospermales.
- b) Describe recent trends in classification of Gymnosperm.

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

- a) Describe in brief Bennettiales.
- b) Describe diversity of Gymnosperm with respect to Reproduction.

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**M.Sc. (Semester - II) (New) (CBCS) Examination: Oct/Nov - 2022
(BOTANY)**

Tools & Techniques in Botany

Day & Date: Tuesday, 21-02-2023

Max. Marks: 80

Time: 11:00 AM To 02:00 PM

- Instructions:** 1) Q. no. 1 & Q. No. 2 are compulsory.
2) Attempt any three questions from Q. No 3 To 7.
3) Figures to the 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) Poisoning
 - 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) _____ gas is commonly used in affinity chromatography
 - a) He
 - b) N2
 - c) H
 - d) All
- 6) In centrifugation _____ forces acts on solvent.
 - a) Centripetal
 - b) Centrifugal
 - c) Gravitational
 - d) All the above
- 7) The stable phase in chromatography is called as _____.
 - a) Phase
 - b) Stationary phase
 - c) Mobile phase
 - d) Reducing phase
- 8) _____ is used for detection of DNA.
 - a) Bromophenol blue
 - b) Alcohol
 - c) MnSO4
 - d) Tris HCL
- 9) In ion exchange chromatography separation is based on _____.
 - a) Density
 - b) Charge on molecule
 - c) Volume
 - d) Colour Intensity
- 10) _____ is used to detect the radiations
 - a) Dosimeter
 - b) Calorimeter
 - c) HPCL
 - d) Refractometer

b) Fill in the blanks-

06

- i) HPLC stands for _____.
- ii) Object scanning takes place by using _____ microscope.

- iii) Formula for centrifugation _____.
- iv) _____ size of herbarium sheet.
- v) Type of centrifuge used to separate blood & plasma is _____.
- vi) Liquid phase in chromatography is called as _____.

- Q.2 Answer the following:** **16**
- a) Describe Scanning electron micrography.
 - b) Steps in herbarium preparation
 - c) Radioactivity
 - d) Applications of Affinity chromatography
- Q.3 Answer the following:** **16**
- a) Describe the principle, working & applications of gel electrophoresis.
 - b) Describe ultracentrifuge.
- Q.4 Answer the following:** **16**
- a) Describe the principle, working & applications of gas chromatography.
 - b) Describe electron micrography.
- Q.5 Answer the following:** **16**
- a) Describe the principle, working & applications NMR.
 - b) Write a note on fixatives & permanent preparations.
- Q.6 Answer the following:** **16**
- a) Write a note on NCBI.
 - b) Give working & applications of electron micrography
- Q.7 Answer the following:** **16**
- a) Describe Flame spectrophotometry.
 - b) Describe principle, working & applications of Affinity chromatography.

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**M.Sc. (Semester - II) (New) (CBCS) Examination: Oct/Nov - 2022
(BOTANY)**

Cell and Molecular Biology

Day & Date: Wednesday, 22-02-2023
Time: 11:00 AM To 02:00 PM

Max. Marks: 80

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

Q.1 a) Rewrite the sentences by choosing correct answer from given alternative 10

- 1) Gorter and Grendel proposed _____ lipid model of Plasma membrane
 - a) monomolecular
 - b) Bimolecular
 - c) tetramolecular
 - d) Trimolecular
- 2) Mitochondria and chloroplasts share several common features, for example
 - a) Neither are components of the nucleus
 - b) each contains small Circular molecule of DNA
 - c) both organelle are capable synthesizes some of its own protein
 - d) all of the above
- 3) Microtubules are made up of
 - a) flagellin
 - b) desmin
 - c) tubulin
 - d) actin and myosin
- 4) In semi conservative replication newly synthesized DNA strand consists _____
 - a) Two new strands
 - b) One new strand
 - c) Two old strands
 - d) One old and one new strand
- 5) Mitochondrial DNA replication starts with formation of _____.
 - a) D loop
 - b) R loop
 - c) S phase
 - d) None of the above
- 6) Proteins attached at the polar surface of the lipid molecules are known as _____.
 - a) integral
 - b) peripheral
 - c) intrinsic
 - d) endodermal
- 7) Ligase enzyme performs _____
 - a) Synthesis of mRNA
 - b) Synthesis of DNA
 - c) Synthesis of RNA primer
 - d) Joining breaks in DNA
- 8) SOS is a _____ mechanism.
 - a) RNA transcription
 - b) DNA replication
 - c) DNA damage
 - d) DNA repair
- 9) _____ are present in the core histones.
 - a) H2A
 - b) H2B
 - c) H3
 - d) All of these

- 10) _____ is a stop codon.
- | | |
|--------|--------|
| a) AUG | b) UCA |
| c) UCU | d) UGA |

b) Write true or false **06**

- i) Methionine is coded by AUG codon.
- ii) Mitochondria and chloroplast are semi autonomous organelles.
- iii) Genetic code shows ambiguous property.
- iv) Transcription is the transfer of genetic information from DNA to mRNA.
- v) Smooth endoplasmic reticulum having ribosomes attached with its membranes.
- vi) Phospholipids in plasma membrane are amphipathic in nature.

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

- a) Write a note on Cyclin and CDKs.
- b) Write a note on ultrastructure of chloroplast.
- c) Write a note on Histone proteins.
- d) GISH

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

- a) Explain different models of plasma membrane.
- b) Describe in detail structure and functions of ER.

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

- a) Give an account on confocal microscopy.
- b) Describe different types of pumps present on membrane.

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

- a) What is apoptosis? Describe the role of caspases and P53 in apoptosis.
- b) Describe in detail contribution of Nirenberg and Khorana in genetic code.

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

- a) Describe in brief ultrastructure and genome organization in mitochondria.
- b) Describe in brief structure and role of microtubules and microfilaments.

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

- a) Describe in detail mechanism of DNA damage and DNA repair.
- b) Describe in brief chemical composition and functions of plasma membrane.

- Q.1 B) Fill in the blanks. 06**
- 1) _____ & _____ types of linkage.
 - 2) _____ technique used for cloning of DNA.
 - 3) Restriction endonucleases are isolated from _____.
 - 4) New process can be applied for _____.
 - 5) YEP stands for _____.
 - 6) _____ type of restriction endonucleases cut the DNA at specific sites.
- Q.2 Answer the following. 16**
- A) Explain genetic markers.
 - B) Describe complete linkage.
 - C) Describe applications of RFLP.
 - D) Describe role of Rec genes.
- Q.3 Answer the following. 16**
- A) What is Somatic embryogenesis & write a note on its applications?
 - B) Write properties of good vector.
- Q.4 Answer the following. 16**
- A) Write the process of crossing over.
 - B) Write note on IPR.
- Q.5 Answer the following. 16**
- A) Describe in brief about Patents.
 - B) Describe the process & applications of agarose gel electrophoresis.
- Q.6 Answer the following. 16**
- A) Describe genome organization in viruses.
 - B) Describe role of bioinformatics in life sciences.
- Q.7 Answer the following. 16**
- A) What are molecular markers? describe AFLP with its applications.
 - B) Describe BLASTA & its applications.

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**M.Sc. (Semester - III) (New) (CBCS) Examination: Oct/Nov-2022
(BOTANY)**

Advances in Plant Metabolism and Biochemistry

Day & Date: Wednesday, 15-02-2023

Max. Marks: 80

Time: 11:00 AM To 02:00 PM

- Instructions:** 1) Q.No.1 and Q.No.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) Fill in the blanks by choosing correct alternatives given below. 10

- 1) Conversion of Pyruvic acid to Acetyl Co-A requires _____ as a cofactor
 - a) Mg⁺⁺
 - b) Fe⁺⁺
 - c) Zn⁺⁺
 - d) Cu⁺⁺
- 2) Phosphorylation produces only ATP molecules.
 - a) Cyclic
 - b) Non cyclic
 - c) Direct
 - d) Indirect
- 3) _____ is the precursor for the formation of aromatic amino acids.
 - a) Iron
 - b) Serine
 - c) Glycine
 - d) Erythrose 4 phosphate
- 4) _____ Calvin cycles needed to form one glucose molecule.
 - a) One
 - b) Two
 - c) Four
 - d) Six
- 5) _____ shows higher rate of respiration
 - a) Seeds
 - b) Developing seeds
 - c) Germinating seeds
 - d) Dry seeds
- 6) Mitochondria are the site of _____
 - a) Photolysis
 - b) Oxidative phosphorylation
 - c) Photophosphorylation
 - d) Starch reactions
- 7) In plants _____ is crucial for biotic and abiotic stress management.
 - a) Cysteine
 - b) Methionine
 - c) Glutathione
 - d) Magnesium
- 8) _____ is the sequence and site of photorespiration.
 - a) Mitochondria, ribosomes and peroxisomes
 - b) Chloroplast, peroxisome and mitochondria
 - c) Chloroplast, mitochondria and chromosomes
 - d) Mitochondria, peroxisomes and chloroplast
- 9) Sulphur assimilation in plants occurs in the _____
 - a) Ribosome
 - b) Mitochondria
 - c) Chloroplast
 - d) Vacuole
- 10) _____ is a type of secondary metabolite called a Tropane.
 - a) Atropine
 - b) Tannin
 - c) Flavonoids
 - d) Alkaloids

- B) True or False.** **06**
- 1) Isoprene units are synthesized in plants from acetyl COA through shikimic acid pathway.
 - 2) In photosynthesis, CO₂ is reduced to sugars.
 - 3) Glutathione a common sulphur containing peptide in plants.
 - 4) The first reaction in photorespiration is carboxylation.
 - 5) Ascorbate organic acid acts as an antioxidant in plants.
 - 6) VAM plus preparation contains chlamydospores as an asexual spores.

- Q.2 Answer the following** **16**
- a) Forms of Sulphur in soil and plants
 - b) Cyclic photophosphorylation
 - c) Cyanide resistance pathway
 - d) The role of Malic acid in acid metabolism

- Q.3 Answer the following** **16**
- a) What are Photosynthetic pigments? Explain in detail Photosynthetic pigments in plants.
 - b) Describe in brief Gluconeogenesis.

- Q.4 Answer the following** **16**
- a) Describe the modern concept of electron transport chain in Mitochondria.
 - b) Explain the VAM and P nutrition.

- Q.5 Answer the following** **16**
- a) Biosynthesis of sulphur containing amino acids.
 - b) Give an account of Biosynthesis of starch and its regulation.

- Q.6 Answer the following** **16**
- a) Explain in detail Shikimic acid pathway.
 - b) Describe Pentose phosphate pathway.

- Q.7 Answer the following** **16**
- a) Write a note on Biosynthesis and role of Glutathione in plants.
 - b) Write a note on secondary metabolites.

Seat No.	
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**M.Sc. (Semester - III) (New) (CBCS) Examination: Oct/Nov-2022
(BOTANY)**

Angiosperm Systematics

Day & Date: Wednesday, 15-02-2023
Time: 11:00 AM To 02:00 PM

Max. Marks: 80

- Instructions:** 1) Q. Nos. 1 and. 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 correct alternative (MCQ) 10

- 1) Carl Linnaeus recognized 24 classes of angiosperm in his _____.
a) Genera Plantarum b) Flora Lapponica
c) Species Plantarum d) Hortus Malbaricus
- 2) Which of the following is exotic weed?
a) *Abutilon indicum* b) *Combratum indicum*
c) *Jasminum malbaricum* d) *Ipomoea cornea*
- 3) _____ is a database in which it indicates the status of names with symbols instead of complete protologue citation of scientific name.
a) IAPT b) Tropicos
c) BHL d) IPNI
- 4) Phylogenetic system differs from a natural system in its stress on _____.
a) Anatomical details
b) Physiological traits
c) Morphological traits
d) Origin and evolutionary trends
- 5) The relative richness of different species in an area is known as _____.
a) Alpha index b) Beta index
c) Delta index d) Omega index
- 6) How closely related individual are situated in nature is known as _____.
a) Spatial relationship b) Genetic relationship
c) Tropic relationship d) Phenetic relationship
- 7) The ending for a name of division has been recommended as _____.
a) -phyta b) -ales
c) -aceae d) -inenae
- 8) The _____ placed as a primitive family is the chief demerit of Bentham and Hooker system of classification.
a) Piperaceae b) Ranunculaceae
c) Alismataceae d) Araceae
- 9) The class Monocotyledones include _____ number of series in Bentham and Hooker classification system.
a) 7 b) 8
c) 9 d) 6

- 10) The genus *Bruguiera* belongs to family _____.
- a) Lythraceae
 - b) Rhizophoraceae
 - c) Avicenniaceae
 - d) Meliaceae

B) Fill in the blanks**06**

- 1) The order Personales is placed under the series _____ by Bentham and Hooker.
- 2) _____ is occurs when the death of the last individual in a species occurs.
- 3) _____ is the highest rank considered among the taxonomic hierarchy in taxonomic literature.
- 4) An ecological state wherein a species is introduced to a location where they are restricted to that area is known as _____.
- 5) Galapagos finches are a good example of _____.
- 6) Size of standard herbarium sheet is _____.

Q.2 Answer the following**16**

- a) Explain in brief; 'systematics a key science'.
- b) Write a note on minor categories in hierarchical classification.
- c) What is flora? Give the role of floras in teaching and research.
- d) Describe any two aquatic plants.

Q.3 Answer the following**16**

- a) Explain subclass polypetalous as per Bentham Hooker's system of classification.
- b) Write a note on non-genetic variations.

Q.4 Answer the following**16**

- a) Explain the Theophrastus systems of classification with its brief outline.
- b) Describe various websites which are used in plant taxonomy.

Q.5 Answer the following**16**

- a) Enumerate the various phytogeographical regions of India with special emphasis on vegetation occurs.
- b) Explain the series Microspermae.

Q.6 Answer the following**16**

- a) What is general biological principle? Explain it with suitable example.
- b) Give an account on post-Darwinian systems of classification.

Q.7 Answer the following**16**

- a) Write a note on Botanical survey of India.
- b) Explain exploration, Invasion and introduction.

Seat No.	
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**M.Sc. (Semester - IV) (New) (CBCS) Examination: Oct/Nov-2022
(BOTANY)**

Plant-Tissue Culture and Green House Technology and Hydroponics

Day & Date: Tuesday, 21-02-2023

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 the right indicate full marks.

Q.1 a) Choose correct answer from given alternatives (MCQ): 10

- 1) Transfer of a part of old culture to new culture vessel is known as
 - a) Subculture
 - b) Inoculation
 - c) Reculture
 - d) None of these
- 2) Differentiation of callus into plant parts is known as
 - a) Embryogenesis
 - b) Morphogenesis
 - c) Embryoid formation
 - d) Totipotency
- 3) Pollen embryoids were discovered by
 - a) Konal and Natraja
 - b) Guha and Maheshwari
 - c) Skoog and Miller
 - d) Helperin and Wetherell
- 4) Hardening is induced by keeping plantlets under
 - a) High light intensity and low humidity
 - b) Low light intensity and low humidity
 - c) Low light intensity and high humidity
 - d) High light intensity and high humidity
- 5) For maximum illumination, the direction of greenhouse should be
 - a) North to south
 - b) East to West
 - c) South east to North east
 - d) Both a and b
- 6) Tissue culture technique can produce indefinite number of new plants from a small parental tissue. The economic importance of this technique is in raising.
 - a) Variants through picking up somaclonal variation
 - b) Genetically uniform population of an elite species
 - c) Homozygous diploid plants
 - d) Development of new species
- 7) Rock wool is the most probably widely used medium in hydroponics, which is obtained from
 - a) Fossil remains
 - b) Basalt rock
 - c) Volcanic rock
 - d) All of these
- 8) Development of shoot and root in tissue culture is determined by
 - a) Cytokinin to auxin ratio
 - b) Enzymes
 - c) Plant nutrients
 - d) Temperature

Seat No.	
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**M.Sc. (Semester - IV) (New) (CBCS) Examination: Oct/Nov-2022
(BOTANY)**

Environmental Plant Physiology

Day & Date: Wednesday, 22-02-2023
Time: 03:00 PM To 06:00 PM

Max. Marks: 80

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

Q.1 a) Rewrite the sentences by Choosing correct answer from given alternatives: 10

- 1) Desert ephemerals are an example of _____ type of plants.
 - a) Drought resistant
 - b) Drought escape
 - c) Drought tolerant
 - d) Drought sensitive
- 2) Disease occurs in the plants when the pathogen lacks _____.
 - a) R genes
 - b) Avr genes
 - c) DIRI genes
 - d) None of these
- 3) SOD catalyzes the reduction of _____ into hydrogen peroxide.
 - a) Molecular oxygen
 - b) Singlet oxygen
 - c) Ozone
 - d) Superoxide
- 4) Hydroxyl (OH*) ions are harmful because they cause _____.
 - a) Decrease in chlorophyll content
 - b) Increase in RNAase
 - c) Peroxidation of membrane lipids
 - d) Inactivation of RUBISCO
- 5) SO₂ and NO₂ Produce pollution by increasing _____.
 - a) Alkalinity
 - b) Acidity
 - c) Neutrality
 - d) Buffer action
- 6) There is a deficiency of _____ in the waterlogged soils.
 - a) Oxygen
 - b) CO₂
 - c) Nutrients
 - d) All the above
- 7) Electrical conductivity of typical saline soil is _____.
 - a) Less than 4ds
 - b) More than 4ds
 - c) Equal to zero
 - d) Not measurable
- 8) Accumulation of _____ phytohormone occurs during water logging.
 - a) IAA
 - b) Cytokinin
 - c) Ethylene
 - d) ABA
- 9) Potassium ions play an important role in _____.
 - a) Stomatal movements
 - b) Protein synthesis
 - c) Cell signaling
 - d) None of the above
- 10) Salt glands are present in halophytes showing _____ Phenomenon.
 - a) Salt evasion
 - b) Salt tolerant
 - c) Salt insensitive
 - d) All of these

- b) Write True or False.** **06**
- 1) During acclimation, tolerance of a plant against a particular stress is decreased.
 - 2) Euryhaline halophytes can resist a narrow range of salt concentrations.
 - 3) Xerophytes and Mesophytes are more prone to water stress.
 - 4) Heat Shock Proteins are produced during high temperature stress.
 - 5) Elastic biological strains are reversible.
 - 6) Jasmonate is biosynthesized from linolenic acid.
- Q.2 Answer the following.** **16**
- a) Define stress & strain. Explain types of biological strain.
 - b) Heat Shock Proteins
 - c) Effect of salinity stress on plants.
 - d) Role of Proline in plants during stress.
- Q.3 Answer the following.** **16**
- a) Describe in brief chilling injury.
 - b) Write about antioxidant system in plants.
- Q.4 Answer the following.** **16**
- a) Effect of SO₂ & NO₂ on plant metabolism.
 - b) Mechanism to overcome water stress.
- Q.5 Answer the following.** **16**
- a) Explain in brief heavy metal stress tolerance in plants.
 - b) Describe in brief Drought resistance mechanism in plants.
- Q.6 Answer the following.** **16**
- a) Effect of flood & tolerance mechanism in plants.
 - b) Describe in brief hypersensitive response.
- Q.7 Answer the following.** **16**
- a) Effect of elevated CO₂ concentration on plant metabolism.
 - b) Describe in brief oxidative stress in plants.

- 9) Apoeidemics refers to _____.
 a) Restricted polyploids which have arisen from widespread diploids.
 b) Restricted diploids which have given rise to widespread polyploids.
 c) Having given rise to more widespread taxon of same chromosome number.
 d) Restricted to small area may arise by mutation, but may be disappear after sometime.
- 10) Red data book contains data of _____.
 a) Dangerous species b) Economically important species
 c) Endangered species d) All of the above.

b) Fill in the blanks. 04

- 1) The term Phenotypic plasticity is also known as _____.
 2) The highest number of chromosomes among the whole plant group is recorded in _____ plant which is $n=630$.
 3) RAPD stands for _____.
 4) _____ Plant group consists closed, conjoint, collateral types of vascular bundles.
 5) There are _____ sub-categories of endemism.
 6) _____ refers to species that has diverged & become reproductively isolated.

Q.2 Answer the following. 16

- a) Explain the vegetative anatomical characters which are of taxonomic importance.
 b) Write a note on GPS.
 c) What is endemism? Describe the types of endemism.
 d) Describe in brief systematic position of family Hydatellaceae.

Q.3 Answer the following.

- a) What is molecular systematics? Describe various diagnostic tools used in studies of molecular systematics? 10
 b) Explain in brief 'The Plant List' website and mention its role in taxonomic studies. 06

Q.4 Answer the following.

- a) What is red data book? Explain in brief the categories included in it with example. 10
 b) Explain TEM and add a note on sieve element plastids. 06

Q.5 Answer the following.

- a) What is numerical taxonomy? Describe the steps involved in numerical taxonomy. 08
 b) Write a note on various biodiversity awareness programmes involved in conservation of biodiversity. 08

Q.6 Answer the following.

- a) Explain in brief cytotaxonomy. 08
 b) Write a note on bar coding. 08

Q.7 Answer the following.

- a) What is phenotypic plasticity? Explain it with to giving the suitable example. 08
 b) Explain serology and give the application of serological data in systematics. 08

Seat No.	
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**M.Sc. (Semester - IV) (New) (CBCS) Examination: Oct/Nov - 2022
(BOTANY)
Crop Physiology**

Day & Date: Thursday, 23-02-2023
Time: 03:00 PM To 06:00 PM

Max. Marks: 80

- Instructions:** 1) Q. No. 1 & Q. No. 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 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) Vernalization
 - 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) Macronutrients fused with special type of glass is called as _____.

- Q.2 Answer the following.** **16**
- a) Write a note on photoperiodism.
 - b) Describe vernalization.
 - c) Write a note on Crop growth analysis.
 - d) Mineral nutrition of groundnut

- Q.3 Answer the following.**
- a) Write a note on BARC. **08**
 - b) Write a note on fruit physiology of Pomegranate. **08**

- Q.4 Answer the following.**
- a) Write a note on Phloem transport. **08**
 - b) Write a note on weedicides. **08**

- Q.5 Answer the following.**
- a) Write a note on Biological fertilizers. **08**
 - b) Write a note on organic farming. **08**

- Q.6 Answer the following.**
- a) Write a note on antitranspirants. **08**
 - b) Write a note on foliar applications of fertilizers. **08**

- Q.7 Answer the following.**
- a) Physiology of Jowar. **08**
 - b) Write a note on ICRISAT. **08**

- b) **Rewrite the sentence & state True or False.** **06**
- 1) Agar-agar is produced from *Gracilaria*.
 - 2) CNG is more polluting fuel than petrol.
 - 3) Fossil fuels can be made in the laboratory.
 - 4) Entrepreneurship Development Program is helpful for First- generation entrepreneurs.
 - 5) Net profit is calculated in profit & loss account.
 - 6) Marketing is an activity that considers only the needs of society as a whole.
- Q.2 Answer the following.** **16**
- a) What is the difference between business and profession?
 - b) Give the distribution of economically important algae in India.
 - c) Explain the method of *spirulina* mass cultivation.
 - d) What are the characteristics of entrepreneur?
- Q.3 Answer the following.**
- a) Explain the formation of bio-ethanol from sugar and cellulose. **10**
 - b) What are the properties and uses of lipid biofuel? **06**
- Q.4 Answer the following.**
- a) Define biopesticide and Add a note on bacterial biopesticide (*Bacillus thuringiensis*). **08**
 - b) Explain the concept of fungal biopesticide. **08**
- Q.5 Answer the following.**
- a) Explain the formation of bio-ethanol from starch & lignocelluloses. **08**
 - b) What is difference between SI engine & CI engines? **08**
- Q.6 Answer the following.**
- a) Explain Fed- batch fermentation and continuous fermentation process. **08**
 - b) What is the Difference between entrepreneur and a Manager? **08**
- Q.7 Answer the following.**
- a) Give the sources and methods of production of citric acid. **08**
 - b) Define management and add a note on its characteristic. **08**

Seat
No.

**M.Sc. (Semester - IV) (Old) (CBCS) Examination: Oct/Nov-2022
(BOTANY)**

Phytogeography and Conservation Biology

Day & Date: Monday, 20-02-2022
Time: 03:00 PM To 06:00 PM

Max. Marks: 80

- Instructions:** 1) Q. no. 1 & Q. No. 2 are compulsory.
2) Attempt any three questions from Q. No. 3 To 7.
3) Figures to the right indicate Full Marks.

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

- 1) Conservation of plants within their own habitat is called as _____.
a) Continuous distribution b) In situ conservation
c) Rare d) Ex situ conservation
- 2) The plants which are restricted to particular area are called as _____.
a) Rare b) Endemic
c) Special d) None
- 3) Phytogeography is the study of _____.
a) Plants & animals
b) Study of plants & animals according to their environment
c) Study of plant & animals with respect to time & space
d) Study of plant & animal diversity
- 4) Phytogeography is divided in to _____ types.
a) Continuous & discontinuous
b) Variable & non variable
c) Descriptive & interpretative
d) Floristic & non floristic
- 5) The place where RET plants are found called as _____.
a) Land b) Hot spots
c) Vegetative land d) Regions
- 6) Distribution of plant species in to different parts of the world is called as _____.
a) Geography
b) Descriptive geography
c) Descriptive phytogeography
d) Interpretative phytogeography
- 7) _____ among the following is an example of endemic distribution.
a) *Ginkgo biloba* b) *Metasequoid*
c) *Sequoia* d) All the above
- 8) _____ is the dominant family in flora of sunderban.
a) Rubiaceae b) Leguminosae
c) Euphorbiaceae d) Liliaceae
- 9) The plant species which are survivors of geological past are called as _____.
a) Endemic b) Relic endemic
c) Paleo endemic d) Neo endemic

- 10) If plants are large in a phytogeographic area, age of the plant is high it comes under-
- a) Age
 - b) Area
 - c) Age & Area hypothesis
 - d) Distribution hypothesis

b) Fill in the blanks-**06**

- i) Western Himalaya represents dominance of _____ family
- ii) Conservation of plants out of their habitat is called as _____
- iii) Seed are conserved by the method called as _____
- iv) Distribution of plants due to shifting of continent is called as _____
- v) Afforestation means _____
- vi) In region in the wild life sanctuaries where human influence was restricted is called as _____.

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

- a) Phytogeographical regions of India according to Chatterjee
- b) Describe age & area hypothesis.
- c) Botanical garden
- d) NBPGR

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

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

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

- a) Flora of eastern Himalaya
- b) Gene banking

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

- a) Write a note on endemism
- b) Flora of Sundarban

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

- a) Flora of western Himalaya
- b) Mangrove vegetation of India

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

- a) Biotechnological method of conservation
- b) What are hotspots & describe the RET plants

Seat No.	
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**M.Sc. (Semester - IV) (Old) (CBCS) Examination: Oct/Nov-2022
(BOTANY)**

Plant-Tissue Culture and Green House Technology and Hydroponics

Day & Date: Tuesday, 21-02-2023

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 the right indicate full marks.

Q.1 a) Choose correct answer from given alternatives (MCQ): 10

- 1) Transfer of a part of old culture to new culture vessel is known as
 - a) Subculture
 - b) Inoculation
 - c) Reculture
 - d) None of these
- 2) Differentiation of callus into plant parts is known as
 - a) Embryogenesis
 - b) Morphogenesis
 - c) Embryoid formation
 - d) Totipotency
- 3) Pollen embryoids were discovered by
 - a) Konal and Natraja
 - b) Guha and Maheshwari
 - c) Skoog and Miller
 - d) Helperin and Wetherell
- 4) Hardening is induced by keeping plantlets under
 - a) High light intensity and low humidity
 - b) Low light intensity and low humidity
 - c) Low light intensity and high humidity
 - d) High light intensity and high humidity
- 5) For maximum illumination, the direction of greenhouse should be
 - a) North to south
 - b) East to West
 - c) South east to North east
 - d) Both a and b
- 6) Tissue culture technique can produce indefinite number of new plants from a small parental tissue. The economic importance of this technique is in raising.
 - a) Variants through picking up somaclonal variation
 - b) Genetically uniform population of an elite species
 - c) Homozygous diploid plants
 - d) Development of new species
- 7) Rock wool is the most probably widely used medium in hydroponics, which is obtained from
 - a) Fossil remains
 - b) Basalt rock
 - c) Volcanic rock
 - d) All of these
- 8) Development of shoot and root in tissue culture is determined by
 - a) Cytokinin to auxin ratio
 - b) Enzymes
 - c) Plant nutrients
 - d) Temperature

Seat No.	
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**M.Sc. (Semester - IV) (Old) (CBCS) Examination: Oct/Nov-2022
(BOTANY)**

Environmental Plant Physiology

Day & Date: Wednesday, 22-02-2023
Time: 03:00 PM To 06:00 PM

Max. Marks: 80

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

Q.1 a) Rewrite the sentences by Choosing correct answer from given alternatives: **10**

- 1) Desert ephemerals are an example of _____ type of plants.
 - a) Drought resistant
 - b) Drought escape
 - c) Drought tolerant
 - d) Drought sensitive
- 2) Disease occurs in the plants when the pathogen lacks _____.
 - a) R genes
 - b) Avr genes
 - c) DIRI genes
 - d) None of these
- 3) SOD catalyzes the reduction of _____ into hydrogen peroxide.
 - a) Molecular oxygen
 - b) Singlet oxygen
 - c) Ozone
 - d) Superoxide
- 4) Hydroxyl (OH*) ions are harmful because they cause _____.
 - a) Decrease in chlorophyll content
 - b) Increase in RNAase
 - c) Peroxidation of membrane lipids
 - d) Inactivation of RUBISCO
- 5) SO₂ and NO₂ Produce pollution by increasing _____.
 - a) Alkalinity
 - b) Acidity
 - c) Neutrality
 - d) Buffer action
- 6) There is a deficiency of _____ in the waterlogged soils.
 - a) Oxygen
 - b) CO₂
 - c) Nutrients
 - d) All the above
- 7) Electrical conductivity of typical saline soil is _____.
 - a) Less than 4ds
 - b) More than 4ds
 - c) Equal to zero
 - d) Not measurable
- 8) Accumulation of _____ phytohormone occurs during water logging.
 - a) IAA
 - b) Cytokinin
 - c) Ethylene
 - d) ABA
- 9) Potassium ions play an important role in _____.
 - a) Stomatal movements
 - b) Protein synthesis
 - c) Cell signaling
 - d) None of the above
- 10) Salt glands are present in halophytes showing _____ Phenomenon.
 - a) Salt evasion
 - b) Salt tolerant
 - c) Salt insensitive
 - d) All of these

- b) Write True or False.** **06**
- 1) During acclimation, tolerance of a plant against a particular stress is decreased.
 - 2) Euryhaline halophytes can resist a narrow range of salt concentrations.
 - 3) Xerophytes and Mesophytes are more prone to water stress.
 - 4) Heat Shock Proteins are produced during high temperature stress.
 - 5) Elastic biological strains are reversible.
 - 6) Jasmonate is biosynthesized from linolenic acid.
- Q.2 Answer the following.** **16**
- a) Define stress & strain. Explain types of biological strain.
 - b) Heat Shock Proteins
 - c) Effect of salinity stress on plants.
 - d) Role of Proline in plants during stress.
- Q.3 Answer the following.** **16**
- a) Describe in brief chilling injury.
 - b) Write about antioxidant system in plants.
- Q.4 Answer the following.** **16**
- a) Effect of SO₂ & NO₂ on plant metabolism.
 - b) Mechanism to overcome water stress.
- Q.5 Answer the following.** **16**
- a) Explain in brief heavy metal stress tolerance in plants.
 - b) Describe in brief Drought resistance mechanism in plants.
- Q.6 Answer the following.** **16**
- a) Effect of flood & tolerance mechanism in plants.
 - b) Describe in brief hypersensitive response.
- Q.7 Answer the following.** **16**
- a) Effect of elevated CO₂ concentration on plant metabolism.
 - b) Describe in brief oxidative stress in plants.