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M.Sc. (Semester - I) (CBCS) Examination Nov/Dec-2018
Botany
TOOLS AND TECHNIQUES IN BOTANY

Time: 2½ Hours

Max. Marks: 70

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

Q.1 Rewrite the sentences by choosing correct answer from given alternatives: 14

- 1) The basic theory of atomic absorption states that _____.
 a) The incident light intensity is directly proportional to atom concentration
 b) Light is absorbed by ground-state electrons
 c) The transmitted light is proportional to the ground state atoms
 d) Absorption results in the lowering of energy levels of most atoms
- 2) _____ is the most suitable gas to use as a carrier gas in a gas chromatogram.
 a) Helium
 b) Oxygen
 c) Methane
 d) Both a and c
- 3) HPLC stands for _____.
 a) High Pressure Liquid Chromatography
 b) High Performance Liquid Chromatography
 c) Both a and b
 d) Highly placed Liquid Chromatography
- 4) The ultracentrifuge method for determining the molecular weight of proteins was discovered by _____.
 a) Svedberg
 b) Tiselius
 c) Schraiber
 d) Bouguer
- 5) The biggest herbarium in India is _____.
 a) I.A.R.I. Delhi
 b) Central National Herbarium, Calcutta
 c) St. Xavier's Herbarium, Bombay
 d) Forest Research Institute, Dehradun
- 6) Isotopes of an element _____.
 a) May or may not be radioactive
 b) Have the same atomic number but differing atomic masses
 c) May be used for human disease diagnostics
 d) All of the above
- 7) A Geiger-Muller counter is able to provide an indirect measure of radioactivity because radiation has a property of _____.
 a) Ionization
 b) Making matter glow in the dark
 c) Fogging photographic film
 d) Attracting electrons
- 8) The main advantage of fluorescence over UV-Vis spectroscopy is _____.
 a) Its sensitivity
 b) Its compatibility with separation techniques
 c) Its compatibility with most analysts
 d) None of these

- 9) Chi square test (X^2) is _____.
- Measure the degree of deviation of the experimental result from the expected result
 - To test the closeness of observed and expected frequency
 - To test the population variance and sample variance
 - All of these
- 10) Living, unstained cells and organism can be observed best using _____.
- Fluorescent microscopy
 - TEM
 - Phase contrast microscopy
 - Scanning electron microscope
- 11) Which of the following identifies three types of sources used in AAS?
- Hollow Cathode Lamp (HCL), Electrodeless Discharge Lamp (EDL), Argon Lamp
 - Electrodeless Discharge Lamp (EDL), Deuterium (D2) lamp, Hollow Cathode Lamp (HCL)
 - Deuterium (D2) lamp, plasma, flame
 - Neon lamp, Acetylene torch, Tungsten lamp
- 12) Scanning electron microscopy (SEM) is best used to study _____.
- Small internal cell structures
 - Internal structure of live, motile cells
 - Surface morphology
 - All of the above
- 13) In _____ distribution probability of success remains constant from trial to trial.
- Normal
 - Poisson
 - Binomial
 - None of these
- 14) _____ chemical is used for poisoning the specimens in herbarium technique.
- KCl
 - AgNO₃
 - HCl
 - HgCl₂

- Q.2 a) Answer the following:- (Any four) 08**
- Define pH and give its scale.
 - What is probability?
 - Give any two application of phase contrast microscopy.
 - Write any two application of gel electrophoresis.
 - What is half-life of radio isotopes?
- b) Write notes on. (Any two) 06**
- Principle of Flame spectrophotometry
 - O-banding
 - Effect of radiation on biological system
- Q.3 a) Answer the following:- (Any two) 08**
- Describe coefficient of variation.
 - Explain principle of electron microscope.
 - Write a note on radioactivity counting system.
- b) Answer the following:- (Any two) 06**
- Write application of computer in life science.
 - Describe herbarium technique.
 - Explain important herbaria in India.
- Q.4 a) Answer the following:- (Any two) 10**
- Describe photomicrography.
 - Explain Chi-square test.
 - Explain thermal inactivation point.

b) Answer the following:- (Any one)**04**

- 1) Write application NMR spectroscopy.
- 2) Write application ESR spectroscopy.

Q.5 Answer the following:- (Any two)**14**

- a) Describe principle and application atomic absorption.
- b) Describe principle and application of ultracentrifugation.
- c) Describe principle and application of SEM.

- 12) Pteridosperms developed climax in _____.
- a) Devonian
 - b) Carboniferous
 - c) Permian
 - d) Jurassic
- 13) In Rhynia _____ type of stele is present.
- a) Protostele
 - b) Eustele
 - c) Siphonostele
 - d) Plectostele
- 14) The seed of Lyginopteris was _____.
- a) Orthotropus
 - b) Anotropus
 - c) Hymenotropus
 - d) Campylotropus

- Q.2** a) Explain the diversity of gymnosperms with respect to anatomy. **07**
b) Describe outline of Indian fossil flora with special reference to Lower Gondawana. **07**
- Q.3** a) Give modern trends in classification of Gymnosperms. **07**
b) Give important features of Cordaitales. **07**
- Q.4** a) Give an account on phylogeny of Coniferales. **07**
b) Explain Glossopteris flora. **07**
- Q.5 Describe:-**
- a) Give salient features of order Psilophytales. **05**
 - b) Describe Rajmahal hill flora of upper Gondwana. **05**
 - c) Write short note on Amber. **04**
- Q.6 Explain:-**
- a) Write salient features of welwitschiales. **05**
 - b) Lepidocarpon **05**
 - c) Lyginopteris **04**
- Q.7 Write short notes. (Any two)** **14**
- a) Male cone of Podocarpus
 - b) Female cone of Taxus
 - c) Economic importance of coniferales.

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M.Sc. (Semester - II) (CBCS) Examination Nov/Dec-2018
Botany
TAXONOMY OF ANGIOSPERMS

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question no.1 is compulsory.
 2) Figures to the right indicate full marks.
 3) Write any two questions from question 2, 3 and 4.
 4) Write any two questions from question 5, 6 and 7.
 5) Draw neat and labeled diagram whenever necessary.

Q.1 Rewrite the sentences by choosing correct answer from given alternatives: 14

- 1) Flowers in axils of spathaceous bracts are the characteristic feature of family _____.
- | | |
|------------------|-----------------|
| a) Commelinaceae | b) Papaveraceae |
| c) Tiliaceae | d) Magnoliaceae |
- 2) Sacred groves are specially useful in _____.
- | | |
|---------------------------------------|---|
| a) Generating environmental awareness | b) Preventing soil erosion |
| c) Year-round flow of water in rivers | d) Conserving rare and threatened species |
- 3) Perianth is absent in the _____ family.
- | | |
|------------------|---------------------|
| a) Commelinaceae | b) Scrophulariaceae |
| c) Zingiberaceae | d) Araceae |
- 4) Isotype is a duplicate of the _____, which collected by same author from same locality.
- | | |
|--------------|-------------|
| a) Lectotype | b) Syntype |
| c) Neotype | d) Holotype |
- 5) Typology is one of the type of _____.
- | | |
|--------------------|-------------------|
| a) Chemotaxonomy | b) Alpha taxonomy |
| c) Species concept | d) Typification |
- 6) The herbarium specimen is basic tool for plant _____.
- | | |
|-------------------|-------------------|
| a) Classification | b) Phylogeny |
| c) Nomenclature | d) Identification |
- 7) The genus _____ belongs to family Sapotaceae.
- | | |
|---------------------|-----------------|
| a) <i>Manilkara</i> | b) <i>Rosa</i> |
| c) <i>Sorghum</i> | d) <i>Piper</i> |
- 8) Exploratory and consolidation phases of systematics are considered under _____ taxonomy.
- | | |
|--------------|----------|
| a) omega | b) alpha |
| c) numerical | d) cyto |
- 9) Which of the following area in India, is a hotspot of biodiversity?
- | | |
|------------------|--------------------|
| a) Aravali hills | b) Western Ghats |
| c) Eastern Ghats | d) Gangetic Plains |

- 10) Situation tautonym leads to the _____ of a name.
 a) Conserve generic name b) Resolve
 c) Rejection d) Conservation
- 11) *Michelia* is a genus of family _____.
 a) Myrtaceae b) Tiliaceae
 c) Magnoliaceae d) Polygonaceae
- 12) Hookers 'Flora of British India' is an example of _____.
 a) Monograph b) Continental flora
 c) Local flora d) Regional flora
- 13) _____ is an example of ex-situ conservation.
 a) National park b) Wildlife sanctuary
 c) Seed bank d) Sacred groves
- 14) Criteria _____ is used when taxon has not yet been assessed against criteria.
 a) Endangered b) Extinct
 c) Vulnerable d) Not evaluated

- Q.2 Write about:-** **14**
 a) Effective and valid publications.
 b) Aims and principles of the Taxonomy.
- Q.3 Describe :-** **14**
 a) Merits and demerits of Cronquist's system of classification
 b) Typological species concept.
- Q.4 Explain:-** **14**
 a) What is hotspot, comment on hotspots in India.
 b) What are the strategies for species conservation?
- Q.5 a) Write short notes on:** **10**
 1) Rejection of names.
 2) Subclass-Commelinadeae with suitable example.
b) Give the distinguishing characters of Piperaceae with example (species). **04**
- Q.6 a) Write short notes on:-** **10**
 1) Chemotaxonomy
 2) Floristic diversity of India.
b) Note on rejection of names with their situations. **04**
- Q.7 a) Write short notes on:-** **10**
 1) What is Typification and comment on articles?
 2) What is citation of authority and transference with example?
b) Give the distinguishing characters of Sapotaceae with example (species). **04**

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**M.Sc. (Semester - II) (CBCS) Examination Nov/Dec-2018
Botany**

CELL AND MOLECULAR BIOLOGY OF PLANTS

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question no.1 is compulsory.
2) Figures to the right indicate full marks.
3) Attempt any two questions from Q. 2, 3 and 4.
4) Attempt any two questions from Q. 5, 6 and 7.
5) Draw neat and labeled diagram wherever necessary.

Q.1 Rewrite the sentences by choosing correct answer from given alternatives: 14

- 1) _____ lipids is most abundantly present in plasma membrane.
 - a) Phospholipids
 - b) Sphingolipids
 - c) Glycolipids
 - d) Sterols
- 2) _____ type of ATPases are present on the cell membrane.
 - a) ABC transporters
 - b) V-types
 - c) P-type
 - d) All of these
- 3) _____ is not present in the core histones.
 - a) H2A
 - b) H2B
 - c) H3
 - d) H1
- 4) Okazaki fragments are absent on _____ DNA strand during replication.
 - a) Leading
 - b) Lagging
 - c) 5' to 3'
 - d) None of these
- 5) MTOC stands for _____.
 - a) Microtubule Original Core
 - b) Mitochondria Organizing Centre
 - c) Microtubule Organ Centre
 - d) Microtubule Organizing Centre
- 6) Capping and polyadenylation occurs in _____ RNA editing.
 - a) tRNA
 - b) rRNA
 - c) mRNA
 - d) snRNA
- 7) _____ is a tumor suppressor protein.
 - a) CDK
 - b) p53
 - c) Caspases
 - d) p450
- 8) _____ is not a stop codon.
 - a) UGA
 - b) UGG
 - c) UAA
 - d) UAG
- 9) _____ is the immediate source of energy for active transport.
 - a) Carbohydrates
 - b) Lipids
 - c) ATP
 - d) A & b
- 10) GISH stands for _____.
 - a) Gene in situ hybridization
 - b) Genomic in situ hybridization
 - c) Genetic in situ hybridization
 - d) Genomic in silicon hybridization
- 11) Photolyase is a _____ enzyme.
 - a) DNA transcription
 - b) DNA replication
 - c) DNA repair
 - d) RNA replication

- 12) Satellite DNA is present in _____ region.
a) Coding
b) Non coding
c) Centromere
d) b & c
- 13) The DNA sequence spreads by forming additional copies of itself within the genome is called _____.
a) Junk DNA
b) Selfish DNA
c) Spiritual DNA
d) All of these
- 14) DNA damage is induced by _____.
a) UV radiation
b) Ionizing radiation
c) Mutagens
d) All of these

- Q.2 Write about:-** **14**
a) Describe the models of plasma membrane.
b) What is ATPases? Describe the types of ATPases and their functions.
- Q.3 Explain:-**
a) Write the structure and function of microtubules. **07**
b) Explain principles and applications of confocal microscopy. **07**
- Q.4 Explain:-** **14**
a) What is Cistron? Describe the process of transcription.
b) Explain the genome organization with neat labeled diagram.
- Q.5 a) Write short notes on:** **10**
1) Give account on mechanism of DNA repair.
2) Write the properties of genetic code.
b) Write a note on types of caspases. **04**
- Q.6 a) Write short notes on:-** **10**
1) Write a note on FISH and GISH.
2) Write a note Satellite DNA.
b) Describe the Mitochondria biogenesis. **04**
- Q.7 a) Write short notes on:-** **10**
1) Describe the models of DNA replications.
2) Write a note on storage organelle.
b) Give account on composition of Plasma membrane. **04**

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M.Sc. (Semester - III) (CBCS) Examination Nov/Dec-2018
Botany

PLANT EMBRYOLOGY AND PALYNOLOGY

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw a neat, well labeled, complete diagram wherever necessary.
4) Use of calculators, cell phones, or any other electronic gadgets is prohibited.

Q.1 Rewrite the sentences by choosing correct answer from given alternatives: 14

- 1) Gametophyte developed directly from sporophyte without meiosis is _____.
a) Apospory
b) Parthenogenesis
c) Amphimixis
d) Apogamy
- 2) Intine of pollen grains is made up of _____.
a) Lipid and protein
b) Pectin and lignin
c) Lignin and cutin
d) Cellulose and pectin
- 3) Ovule with one integument is _____ ovule.
a) Ategmic
b) Multitegmic
c) Bitegmic
d) Unitegmic
- 4) Callose is highly _____.
a) impermeable
b) permeable
c) semipermeable
d) all of them
- 5) Entry of pollen tube through integument is _____.
a) chalazogamy
b) mesogamy
c) porogamy
d) pseudogamy
- 6) In _____ male gamete fuses with egg.
a) porogamy
b) siphonogamy
c) syngamy
d) triple fusion
- 7) The first polyembryony was reported in _____ seeds by Antoni van Leeuwenhoek in 1719.
a) Guava
b) Banana
c) Grape
d) Orange
- 8) The branch which deals with study of pollen grain is _____.
a) Cytology
b) Palynology
c) Genetics
d) Paleobotany
- 9) If the types of pollen may vary considerably in size, aperture, stratification of exine, etc. then such taxa are termed as _____.
a) stenopalynous
b) unipalynous
c) eurypalynous
d) None of them
- 10) Bee collected pollens are devoid of _____.
a) Proteins
b) Vitamins
c) Starch
d) Chlorophyll

- 11) _____ family is Stenopalynous.
- | | |
|----------------|-------------------|
| a) Poaceae | b) Convolvulaceae |
| c) Verbenaceae | d) Rubiaceae |
- 12) _____ helps in search of source of oil reservoirs.
- | | |
|-----------------|------------|
| a) Bryophyte | b) Algae |
| c) Microfossils | d) Lichens |
- 13) Pollen grains are stored by _____ methods.
- | | |
|---------------------|--------------------------|
| a) Organic solvents | b) Freezing temperatures |
| c) Cryopreservation | d) All a, b & c |
- 14) _____ is not hay fever test.
- | | |
|---------------------------|-------------------------|
| a) Scratch test | b) Intra-cutaneous test |
| c) Western blot and ELISA | d) Passive transfer |

- Q.2 a) Answer the following:- (Any four) 08**
- 1) Describe pollen wall.
 - 2) Draw neat labelled diagram of typical embryo sac of Angiosperm.
 - 3) Describe function of generative cell.
 - 4) What is Pollenkitt?
 - 5) Describe types of stigma.
- b) Write notes on. (Any two) 06**
- 1) Structure of exine
 - 2) Pollen germination
 - 3) Bee bread
- Q.3 a) Answer the following:- (Any two) 08**
- 1) Describe male gametophyte
 - 2) Write note on embryo culture.
 - 3) What is pollen calendar? Give its importance.
- b) Write note on:- (Any one) 06**
- 1) Explain application of palynology in plant taxonomy with reference to Gymnosperms.
 - 2) Describe any two types of Polyembryony.
- Q.4 a) Answer the following:- (Any two) 10**
- 1) Describe in brief application of anther culture technique.
 - 2) Give account on branches of palynology.
 - 3) Role of microfossils in oil exploration.
- b) Write note on:- (Any one) 04**
- 1) Entry of pollen tube
 - 2) Melittopalynology
- Q.5 Answer the following:- (Any two) 14**
- a)** Describe brief outline of development of male gametophyte.
 - b)** Write an illustrated account of double fertilization and its significance.
 - c)** Describe pollen pistil interactions with its significance.

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No.**M.Sc. (Semester - III) (CBCS) Examination Nov/Dec-2018
Botany****CYTOGENETICS, PLANT BREEDING AND GENETIC ENGINEERING**

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw a neat, well labeled, complete diagram wherever necessary.
4) Use of calculators, cell phones, or any other electronic gadgets is prohibited.

Q.1 Rewrite the sentences by choosing correct answer from given alternatives: 14

- 1) A fully formed infectious viral particle is called as _____.
a) Virion
b) Virusoid
c) Virion
d) Capsid
- 2) Tobacco mosaic virus is _____.
a) Spherical shaped
b) Rod shaped
c) Cuboidal shaped
d) Oval shaped
- 3) Proteins responsible for compact packing and winding chromosomal DNA are _____.
a) Histone
b) Nonhistones
c) Trypsin
d) Serein
- 4) Type of chromatin that participates in active transcription of DNA to mRNA products is _____.
a) Heterochromatin
b) Euchromatin
c) Centromere
d) Achrcentric chromosome
- 5) Region of repetitive nucleotide sequences at each end of chromatid is _____.
a) Centromere
b) Telomere
c) Isomers
d) Monomers
- 6) Euchromatin is _____.
a) Lightly packed form of chromatin
b) Tightly packed form of chromatin
c) Concentrated packed form of chromatin
d) Elongated form of chromatin
- 7) Which of the following process occurs between DNA molecules of very similar sequences?
a) Homologous genetic sequences
b) Site specific recombination
c) Non homologous recombination
d) Replicative recombination
- 8) Which of the following does not code for an enzyme having both helicae ad nuclease activity?
a) Rec A
b) Rec B
c) Rec C
d) Rec D

- 9) One centiMorgan is defined as percent of ____ the total recombination events.
 a) 1
 b) 10
 c) 0.1
 d) 0.01
- 10) Hormone pair required for a callus to differentiate are _____.
 a) Auxin and Cytokinin
 b) Auxin and ethylene
 c) Auxin and abscisic acid
 d) Cytokinins and giberllin
- 11) Emasculation is concerned with _____.
 a) Hybridization
 b) Clonal selection
 c) Mass selection
 d) Pure line selection
- 12) Hybridomas are made by _____.
 a) Fusing T cells with myeloma cells
 b) Fusing B cells with myeloma cells
 c) Fusing T helper cells with myeloma cells
 d) Fusing B memory cells with myeloma cells
- 13) Monoclonal antibodies are used in _____.
 a) Screening of recombinants
 b) Diagnostic kits
 c) The treatment of many cancers
 d) All of these
- 14) Which of the following is not a variant of BLAST
 a) BLASTN
 b) BLASTP
 c) BLASTX
 d) TBLASTNX

- Q.2 a) Answer the following:- (Any four) 08**
 1) Hybrids
 2) Protein data bank
 3) Importance of IPR
 4) Regeneration of protoplast
 5) Amplification
- b) Write notes on. (Any two) 06**
 1) Gene conversion
 2) Independent assortment
 3) Physical map
- Q.3 a) Answer the following:- (Any two) 08**
 1) Write a note on linkage group.
 2) Explain gene mapping.
 3) Use of bioinformatics in research
- b) Answer the following:- (Any one) 06**
 1) Explain genome structure of plasmid.
 2) Describe the method of protoplast isolation.
- Q.4 a) Answer the following:- (Any two) 10**
 1) Explain hybridoma technology.
 2) Explain site specific recombination.
 3) Write a note on mobile genetic element.
- b) Answer the following:- (Any one) 04**
 1) Write a note on NCBI.
 2) Explain mechanism of crossing over.
- Q.5 Answer the following:- (Any two) 14**
 a) Explain size and structure of genome in eukaryotics.
 b) Describe chromosome mapping.
 c) Explain in detail somaclonal variation.

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M.Sc. (Semester - III) (CBCS) Examination Nov/Dec-2018
Botany
ADVANCED PLANT PHYSIOLOGY AND BIOCHEMISTRY

Time: 2½ Hours

Max. Marks: 70

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

Q.1 Rewrite the sentences by choosing correct answer from given alternatives: 14

- 1) Chlorophyll is present in _____.
 a) grana
 b) stroma
 c) lamellae
 d) matrix of mitochondria
- 2) NADPH₂ is generated through _____.
 a) Glycolysis
 b) P.S.I
 c) P.S.II
 d) Anaerobic respirations
- 3) _____ can be used as respiratory substrate.
 a) Carbohydrates
 b) Proteins
 c) Fats and organic acids
 d) All of the above
- 4) _____ phase of respiration is anaerobic.
 a) Glycolysis
 b) TCA Cycle
 c) Kreb's cycle
 d) Oxidation of NADH₂
- 5) The main function of lumen of chlorophyll is to store _____.
 a) protons (H⁺)
 b) electrons
 c) neutron
 d) electrons and neutrons
- 6) _____ is the precursor for the formation of aromatic amino acids.
 a) Erythrose 4 phosphate
 b) Glycine
 c) Serine
 d) Iron
- 7) Sulphate assimilation in plants occurs in the _____.
 a) ribosomes
 b) mitochondria
 c) chloroplast
 d) vacuoles
- 8) _____ type of reactions occurs in TCA cycle.
 a) Anabolic
 b) Catabolic
 c) Amphibolic
 d) None of these
- 9) Ribulose diphosphate carboxylase oxygenase is located in _____.
 a) Mitochondria
 b) Chloroplasts
 c) Peroxisomes
 d) Golgi bodies
- 10) _____ Pigment gets excited first in non cyclic photophosphorylation.
 a) P₆₈₀
 b) P₇₀₀
 c) Xanthophyll
 d) Chlorophyll b
- 11) The exact role of O₂ in respiration is in _____.
 a) glycolysis
 b) TCA Cycle
 c) Formation of Acetyl Co-A
 d) terminal oxidation

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**M.Sc. (Semester - IV) (New) (CBCS) Examination Nov/Dec-2018
Botany**

PHYTOGEOGRAPHY AND CONSERVATION BIOLOGY

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Attempt totally five questions.
 2) Figures to the right indicate full marks.
 3) Question no.1 is compulsory (Section - I)
 4) Attempt any two questions from question no. 2 to 4 (Section – II).
 5) Attempt any two questions from question no. 5 to 7 (Section – III).

Section – I

Q.1 Rewrite the sentences by choosing correct answer from given alternatives: 14

- 1) Humans are part of nature rich diversity and have the power to _____ or _____ it.

a) Regulate or Protect	b) Recreate or Destroy
c) Protect or Destroy	d) Regulate or Recreate
- 2) _____ is declared as the International year of biodiversity.

a) 2010	b) 2020
c) 2015	d) 2025
- 3) All the different kinds of living things found in a convinced habitat are called as _____.

a) Genetic diversity	b) Population diversity
c) Species diversity	d) Ecological diversity
- 4) Threatened species are documented in _____.

a) Rae plants of India	b) Endemic flowering plants of Maharashtra
c) Ethnobiology of India	d) Red Data Book
- 5) The sentence 'the older the species, the wider its range' supports for the _____.

a) Relationship of plant geography	b) Age and Area hypothesis
c) Endemism	d) Continental-drift theory
- 6) The species conserve with its natural habitat means _____ conservation.

a) Ex-situ	b) In-situ
c) In-vivo	d) In-vitro
- 7) _____ is the endemic plant species on Kas plateau.

a) <i>Rotala serpyllifolia</i>	b) <i>Anagallis pumila</i>
c) <i>Crypsis aculeata</i>	d) <i>Rotala sahyadrica</i>
- 8) Green House effect is the result of _____.

a) Land acquisition and over grazing	b) Use of chemical fertilizers
c) Use of huge amount of coal, gasoline and oil	d) Outbreak of volcano

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M.Sc. (Semester - IV) (New) (CBCS) Examination Nov/Dec-2018
Botany
PLANT TISSUE CULTURE AND GREEN HOUSE TECHNOLOGY AND
HYDROPONICS

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question no. 1 is compulsory.
 2) Figures to the right indicate full marks.
 3) Attempt any two questions from Q.2, 3 and 4.
 4) Attempt any two questions from Q.5, 6 and 7.

Q.1 Rewrite the sentences by choosing correct answer from given alternatives: 14

- 1) _____ application of callus culture.
 - a) Cell & organ differentiation
 - b) Somaclonal variation
 - c) Isolation of single cell
 - d) Both a & b
- 2) The process in which there is addition of fresh nutrient medium & draining out used medium called as _____.
 - a) Suspension culture
 - b) Batch culture
 - c) Continuous culture
 - d) Cell culture
- 3) Synchronization of suspension culture takes place with the help of _____.
 - a) Chemical inhibition
 - b) Colchicines
 - c) Starvation
 - d) All of these
- 4) Production of variant clones with new characters this phenomenon is known as _____.
 - a) Totipotency
 - b) Clonal propagation
 - c) Somatic variation
 - d) Somaclonal variation
- 5) Use of immature embryos for in vitro production of hybrids called as _____.
 - a) Cybrids
 - b) Hybrids
 - c) Embryo culture
 - d) Embryo rescue
- 6) _____ hormone promotes production of secondary metabolite in tissue culture.
 - a) Auxin
 - b) Cytokinin
 - c) GA
 - d) ABA
- 7) _____ media generally preferred for root culture.
 - a) White's
 - b) MS
 - c) B₅
 - d) Nitsch's
- 8) _____ enzymes are commercially used enzymes for protoplast isolation.
 - a) Cellulase
 - b) Hemicelluloses
 - c) Pectinases
 - d) All of these
- 9) _____ element in MS media required for chlorophyll biosynthesis.
 - a) Nitrogen
 - b) Molybdenum
 - c) Zinc
 - d) Sulphur
- 10) For callus initiation ratio of auxin to cytokinin is _____.
 - a) High
 - b) Low
 - c) Moderate
 - d) Very low

Seat No.	
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M.Sc. (Semester - IV) (New) (CBCS) Examination Nov/Dec-2018
Botany

ENVIRONMENTAL PLANT PHYSIOLOGY

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Attempt totally five questions.
2) Q.1 is compulsory.
3) Figures to the right indicate full marks.
4) Attempt any two questions from Q.2 to Q.4.
5) Attempt any two questions from Q.5 to Q.7.

Q.1 Rewrite the sentences by choosing correct answer from given alternatives: 14

- 1) Tissue water potential is measured in the units of _____.
a) Amperes
b) Volts
c) Calories
d) Megapascals
- 2) Desert ephemerals are an example of _____ type of plants.
a) Drought resistant
b) Drought escape
c) Drought tolerant
d) Drought sensitive
- 3) Photorespiration in C₃ plants gets _____ when CO₂ level is increased.
a) Increased
b) Reduced
c) Maintained
d) Balanced
- 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 acids in their lipid bilayer.
a) Saturated
b) Long chain
c) Unsaturated
d) Short chain
- 6) SOD catalyzes the reduction of _____ into 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_x and SO₂
b) NO₂ and O₃
c) SO₂ and O₃
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- 8) _____ is a halophyte.
a) *Suaeda*
b) Sugarbeet
c) Date palm
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- 9) Accumulation of _____ phytohormone occurs during waterlogging.
a) IAA
b) Cytokinin
c) Ethylene
d) ABA
- 10) In sodic soils a high concentration of _____ is present.
a) Salt
b) Sodium
c) Potassium
d) Sand

- 11) Potassium ions play an important role in _____.
- a) Stomatal movements b) Protein synthesis
c) Cell signalling d) None of the above
- 12) Manganese toxicity in plants is identified by _____.
- a) Chlorosis
b) Necrosis
c) Brown spots surrounded by chlorotic zone
d) All the above
- 13) Disease occurs in the plants when the pathogen lacks _____.
- a) R genes b) avr genes
c) DIR1 genes d) None of these
- 14) _____ are considered to be the indicators of heavy metal stress.
- a) Compatible solutes b) Phytochelatins
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- Q.2** What is a disease? Describe biochemical changes occurring in the host tissue during fungal infection. **14**
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b) Write a note on mechanism of salt tolerance in higher plants. **07**
- Q.4 Describe in brief:-**
- a) Effects of water stress on plant metabolism. **07**
b) Structural adaptation in xerophytes in response to water stress. **07**
- Q.5 Write on:**
- a) Effect of SO₂ on plant metabolism. **07**
b) Chilling injury **07**
- Q.6 Give an account of:-**
- a) Reactive oxygen species in plants and their origin. **07**
b) Antioxidants in plants and their role. **07**
- Q.7 Write short notes on any three:-** **14**
- a) Proline accumulation in plants
b) Heat shock proteins
c) Effects of flood and tolerance mechanism in plants
d) Impact of elevated CO₂ concentration on plants

Seat No.	
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**M.Sc. (Semester - IV) (New) (CBCS) Examination Nov/Dec-2018
Botany
CROP PHYSIOLOGY**

Time: 2½ Hours

Max. Marks: 70

- Instructions:**
- 1) Answer any five questions.
 - 2) Question No. 1 is compulsory.
 - 3) Answer any two questions from Q.No.2, 3 & 4
 - 4) Answer any two questions Q.No.5, 6 & 7.
 - 5) Figures to the right indicate full marks.

Q.1 Rewrite the sentences by choosing correct answer from given alternatives: 14

- 1) Aspirin and Salicylic acids controls the movement of _____.
 - a) Xylem tissue
 - b) Phloem tissue
 - c) Stomatal aperture
 - d) None of these
- 2) In DNP flowering is interrupted by _____.
 - a) Dark Condition is interrupted by Far-red or red-light
 - b) Dark Condition is interrupted by red light followed by far-red lights
 - c) Dark Condition is interrupted by white or red-light
 - d) None of above
- 3) The substances which kills weeds known as
 - a) Weedicides
 - b) Fungicides
 - c) Bactericides
 - d) Vivicides
- 4) What is full form of BARC?
 - a) Bhartia Automatic Research Centre
 - b) Bhartia Agricultural Centre
 - c) Bhabha Atomic Research Centre
 - d) Bhartia Atomic Centre
- 5) Growth follows sequence of growth phase is _____.
 - a) Lag-log-stationary
 - b) Log-lag-stationary
 - c) Stationary lag
 - d) Lag-stationary-log
- 6) The total weight of sink tissue is known as
 - a) Sink-shape
 - b) Sink-size
 - c) Sink weight
 - d) All of these
- 7) Which of the following fertilizer affects badly on agro-ecosystem health including biodiversity, biological cycle and soil properties?
 - a) Compost
 - b) Inorganic
 - c) Organic
 - d) Green manure
- 8) The function of leg hemoglobin is to
 - a) Maintain adequate supply of O₂ to bacterioids
 - b) Protect nitrogenase enzyme inside the bacterioids
 - c) Neither a nor b correct
 - d) Both a and b correct
- 9) Arc indicator used to measure
 - a) Growth of plant
 - b) Rate of Transpiration
 - c) Light intensity
 - d) pH of soil

- 10) During vernalization the cold temperature is received annual and biennial plants by
a) Tips of older leaves b) Tips of young leaves
c) Stem apex d) Roots
- 11) Which of the following pair of enzyme is involved in softening of fruit during its ripening?
a) Peroxidase and catalase b) Pectinase and peroxidase
c) Pectinase and cellulose d) None of these
- 12) Ratio of economic yield to the whole biological yield.
a) Harvest index b) NAR
c) LAR d) RGR
- 13) Which of the following should not be feature of antitranspirants?
a) Toxic to plant
b) Cause damage to stomatal apparatus
c) Causing side effect
d) All of these
- 14) Which of the following is only group of minor elements?
a) Ca, Mg, K b) NPK
c) Na, Ca, K d) Fe, Mo, Zn
- Q.2** a) What is the source and sink relationship? Add note on factors affecting on it. **07**
b) Describe the physiological basis of yield of Jawar. **07**
- Q.3** a) Give an account of a post harvest technology of any plant studied by you **07**
w. r. t. field to customer.
b) What is vernalization? Add note its mechanism. **07**
- Q.4** a) Give an account of use of growth regulators in agriculture. **07**
b) Give an idea about physiology of mineral nutrition in groundnut. **07**
- Q.5 Write a short note on the following:**
a) Write note on research contribution of ICRISAT in crop physiology. **05**
b) Give an account of mode of action of weedcides. **05**
c) Write about application of fertilizers through soil. **04**
- Q.6** a) Write in short about physiology of N₂ fixation in chickpea. **05**
b) What is meant by water use efficiency and n-use efficiency **05**
c) Brief account on idea of physiological basis of yield of sugarcane. **04**
- Q.7 Write short notes on any three:-** **14**
a) Phloem transport
b) Organic farming and its applications
c) Research Institute BARC
d) Post-harvest technology of any fruit studied by you

Seat No.	
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**M.Sc. (Semester - IV) (Old) (CBCS) Examination Nov/Dec-2018
Botany**

PHYTOGEOGRAPHY AND CONSERVATION BIOLOGY

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Attempt totally five questions.
2) Figures to the right indicate full marks.
3) Question no.1 is compulsory (Section - I)
4) Attempt any two questions from question no. 2 to 4 (Section – II).
5) Attempt any two questions from question no. 5 to 7 (Section – III).

Section – I

Q.1 Rewrite the sentences by choosing correct answer from given alternatives: 14

- 1) Humans are part of nature's rich diversity and have the power to _____ or _____ it.

a) Regulate or Protect	b) Recreate or Destroy
c) Protect or Destroy	d) Regulate or Recreate
- 2) _____ is declared as the International year of biodiversity.

a) 2010	b) 2020
c) 2015	d) 2025
- 3) All the different kinds of living things found in a convinced habitat are called as _____.

a) Genetic diversity	b) Population diversity
c) Species diversity	d) Ecological diversity
- 4) Threatened species are documented in _____.

a) Rare plants of India	b) Endemic flowering plants of Maharashtra
c) Ethnobiology of India	d) Red Data Book
- 5) The sentence 'the older the species, the wider its range' supports for the _____.

a) Relationship of plant geography	b) Age and Area hypothesis
c) Endemism	d) Continental-drift theory
- 6) The species conserve with its natural habitat means _____ conservation.

a) Ex-situ	b) In-situ
c) In-vivo	d) In-vitro
- 7) _____ is the endemic plant species on Kas plateau.

a) <i>Rotala serpyllifolia</i>	b) <i>Anagallis pumila</i>
c) <i>Crypsis aculeata</i>	d) <i>Rotala sahyadrica</i>
- 8) Green House effect is the result of _____.

a) Land acquisition and over grazing	b) Use of chemical fertilizers
c) Use of huge amount of coal, gasoline and oil	d) Outbreak of volcano

- 9) The term Age and Area hypothesis was coined by _____.
- a) John Willis b) Alfred Wagner
c) William Smith d) Charles Smith
- 10) Wildlife protection act was established on _____.
- a) 2010 b) 1980
c) 1972 d) 2002
- 11) The Indian Botanical Garden, Kolkata was established in _____ year.
- a) 1787 b) 1984
c) 1998 d) 2000
- 12) _____ theory is also called as polar oscillation theory or shifting of poles.
- a) Land-Bridge theory b) Pendulum theory
c) Age and Area theory d) Continental drift theory
- 13) The term phytogeography means the _____.
- a) Distribution of animals in the geographical regions
b) Distribution of phytoplanktons on earth surface
c) Distribution of plants & animals on earth surface
d) Distribution of plants in the geographical regions.
- 14) _____ are those forest fragments which are commonly protected and generally have important religious implication for protecting society.
- a) Sacred grooves b) Parks
c) Sanctuaries d) Biosphere reserves

Section – II

- Q.2** a) Explain Indian phytogeographical divisions. **07**
b) Comment up in brief on Mangrove vegetation of India. **07**
- Q.3** a) Comment up on Biological diversity act-2002 **07**
b) Explain in brief - concept of the Seed banks. **07**
- Q.4** a) Comment up on Western Ghat vegetation of India. **07**
b) Explain in brief – concept of *endemism*. **07**

Section – III

- Q.5 Explain in brief:**
- a) Biosphere reserve **05**
b) RET plants **05**
c) Gene banks **04**
- Q.6 Explain in brief:**
- a) Local vegetation (i.e. floristic components) **05**
b) Cryopreservation **05**
c) Highlight the main aim of forest conservation act. **04**
- Q.7 Write short notes on any three:-** **14**
- a) National parks
b) NBPGR
c) Sanctuaries
d) Role of NGO's in biodiversity conservation

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M.Sc. (Semester - IV) (Old) (CBCS) Examination Nov/Dec-2018
Botany
PLANT TISSUE CULTURE AND GREEN HOUSE TECHNOLOGY AND
HYDROPONICS

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question no. 1 is compulsory.
 2) Figures to the right indicate full marks.
 3) Attempt any two questions from Q.2, 3 and 4.
 4) Attempt any two questions from Q.5, 6 and 7.

Q.1 Rewrite the sentences by choosing correct answer from given alternatives: 14

- 1) _____ application of callus culture.
 - a) Cell & organ differentiation
 - b) Somaclonal variation
 - c) Isolation of single cell
 - d) Both a & b
- 2) The process in which there is addition of fresh nutrient medium & draining out used medium called as _____.
 - a) Suspension culture
 - b) Batch culture
 - c) Continuous culture
 - d) Cell culture
- 3) Synchronization of suspension culture takes place with the help of _____.
 - a) Chemical inhibition
 - b) Colchicines
 - c) Starvation
 - d) All of these
- 4) Production of variant clones with new characters this phenomenon is known as _____.
 - a) Totipotency
 - b) Clonal propagation
 - c) Somatic variation
 - d) Somaclonal variation
- 5) Use of immature embryos for in vitro production of hybrids called as _____.
 - a) Cybrids
 - b) Hybrids
 - c) Embryo culture
 - d) Embryo resue
- 6) _____ hormone promotes production of secondary metabolite in tissue culture.
 - a) Auxin
 - b) Cytokinin
 - c) GA
 - d) ABA
- 7) _____ media generally preferred for root culture.
 - a) White's
 - b) MS
 - c) B₅
 - d) Nitsch's
- 8) _____ enzymes are commercially used enzymes for protoplast isolation.
 - a) Cellulase
 - b) Hemicelluloses
 - c) Pectinases
 - d) All of these
- 9) _____ element in MS media required for chlorophyll biosynthesis.
 - a) Nitrogen
 - b) Molybdenum
 - c) Zinc
 - d) Sulphur
- 10) For callus initiation ratio of auxin to cytokinin is _____.
 - a) High
 - b) Low
 - c) Moderate
 - d) Very low

- 11) _____ fucogen used for fusion of protoplast.
 a) NaNO_3 b) NaHCO_3
 c) PEG d) Both a & c
- 12) _____ application of cybrid.
 a) Environmental tolerance b) Production of quality
 c) Cytoplasmic male sterility d) All of these
- 13) _____ media used for another culture.
 a) White's b) N_6
 c) B_5 d) All
- 14) Gynogenic haploids were first developed by _____.
 a) Nitsch b) White
 c) San Noem d) Thomas

- Q.2 Write a note on:-**
- a) Meristem culture **07**
 b) Hybridization **07**
- Q.3 Describe in detail:-**
- a) Applications of tissue culture **07**
 b) Applications of synthetic seeds **07**
- Q.4 Describe in detail:-**
- a) Somatic embryogenesis **07**
 b) Factors affecting green house technology **07**
- Q.5 Describe in detail:-**
- a) Procedure of ovary culture **05**
 b) Applications of hydroponics **05**
 c) Continuous batch culture **04**
- Q.6 Describe in detail:-**
- a) Technique of hydroponics **05**
 b) Objectives of plants tissue culture **05**
 c) Applications of callus culture **04**
- Q.7 Any three:-** **14**
- a) Sterilization methods in tissue culture
 b) Macronutrients used in MS media
 c) Different media used in tissue culture
 d) Somatic embryogenesis

Seat No.	
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M.Sc. (Semester - IV) (Old) (CBCS) Examination Nov/Dec-2018
Botany

ENVIRONMENTAL PLANT PHYSIOLOGY

Time: 2½ Hours

Max. Marks: 70

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- 10) In sodic soils a high concentration of _____ is present.
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- 11) Potassium ions play an important role in _____.
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Seat
No.**M.Sc. (Semester - IV) (Old) (CBCS) Examination Nov/Dec-2018****Botany
CROP PHYSIOLOGY**

Time: 2½ Hours

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- Phloem transport
 - Organic farming and its applications
 - Research Institute BARC
 - Post-harvest technology of any fruit studied by you