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M.Sc. – I (Semester – I) Examination, 2014
BOTANY (CGPA Pattern)

Paper I : Biology and Diversity of Fungi, Bacteria Viruses and Lichens

Day and Date : Monday, 21-4-2014

Max. Marks : 70

Time : 11.00 a.m. to 2.00 p.m.

- N. B.** : 1) Attempt **five** questions.
2) Question no. **1** is **compulsory**.
3) Attempt **any two** questions from Section II and **any two** questions from Section III.
4) Answers to **all the 3** Sections should be in the **same** answer book only.
5) Figures to the **right** indicate **full** marks.

SECTION – I

1. Select the correct answer :

14

- 1) Alexopoulos and Mims in 1979 defined fungi as eukaryotic, spore bearing _____ organisms.
a) Prokaryotic
b) Achlorophyllous
c) Autotropic
d) None of these
- 2) When the mycelium contains genetically identical nuclei, it is called _____.
a) homokaryotic
b) heterokaryotic
c) heterotropic
d) None of these
- 3) Biotropic fungi possess _____ for absorption of food from host.
a) appressoria
b) haustoria
c) sclerotia
d) plasmodesmata
- 4) A wart disease of potato is caused by _____.
a) Albugo bliti
b) Colletotrichum fukatum
c) Plasmodiophora brassicac
d) Synchytrium endobioticum
- 5) _____ develop the disease Ergot of Bajara.
a) Claviceps purpurea
b) Erysiphae polygoni
c) Pythium sp.
d) Saprolegnia sp.

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- 6) A septate mycelium of order uredinales have _____ septum.
a) complete
b) incomplete
c) dolipore
d) all the above
- 7) A fungal cell wall mainly consists of _____.
a) cellulose
b) chitin
c) only cellulose
d) both a) and b)
- 8) Mastigomycotina a group of fungi having _____ type of reproductive cells.
a) planogamic
b) motile
c) non motile
d) isogamic
- 9) A complete open fruiting bodies of discomycetes are called _____.
a) apothecia
b) perithecia
c) cleistothecia
d) none of above
- 10) A complete absence of sexual reproduction in _____.
a) deuteromycetes
b) phycomycetes
c) ascomycetes
d) basidiomycetes
- 11) A pleuomorphic nature is associated with _____.
a) plants
b) animals
c) microorganism
d) none of these
- 12) As per biological status of living organisms viruses are _____.
a) non living things
b) living organisms
c) obligate parasites
d) all the above
- 13) Symbiotic bacteria are _____ live in association with their host.
a) pathogenic
b) non pathogenic
c) endotrophic
d) ectotropic
- 14) The archaebacteria are _____ to bacteria.
a) similar
b) dissimilar
c) non cellular
d) none of above



SECTION – II

- | | |
|---|---|
| 2. a) Describe in brief ultrastructure of fungal cells. | 7 |
| b) Discuss nutrition in fungi. | 7 |
| 3. a) What are the important features of deuteromycetes ? | 7 |
| b) Give an account of sporangial structures of myxomycetes. | 7 |
| 4. a) Explain outline of C.G. Ainworth's classification. | 7 |
| b) Explain economic importance of Lichen. | 7 |

SECTION – III

- | | |
|---|----|
| 5. a) Give salient features of order agaricales. | 5 |
| b) Describe the general characters of gastromycetes. | 5 |
| c) Give an account of Thallus structure in ascomycetes. | 4 |
| 6. a) Give important characters of viruses. | 5 |
| b) What are gram –ve bacterial cell walls. | 5 |
| c) Describe the basic structure of plasmodium. | 4 |
| 7. Write notes on any three : | 14 |
| a) Parasexuality | |
| b) Mushroom cultivation | |
| c) Forms of bacteria | |
| d) T.M.V. | |
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M.Sc. – II (Sem. – III) Examination, 2014
BOTANY

Cytogenetics, Plant Breeding and Genetic Engineering (Paper – X)

Day and Date : Wednesday, 23-4-2014

Total Marks : 100

Time : 3.00 p.m. to 6.00 p.m.

- Instructions:** 1) Question number I and VII are **compulsory**.
2) Attempt **any three** questions from the **remaining**.
3) Draw **neat** and labelled diagrams **wherever** necessary.
4) **All** questions carry **equal** marks.

I. Choose the correct answer.

20

- 1) The process in which genetic material is transferred from one bacterium to another without involving any intermediate organism called as _____
 - a) Transduction
 - b) Transformation
 - c) Transition
 - d) Transposition
- 2) _____ is responsible for genetic recombination in prokaryotes as well as eukaryotes.
 - a) DNA breakage and reunion
 - b) Union of DNA and RNA
 - c) DNA synthesis and breakage
 - d) Replication of DNA
- 3) In bacterial cell, in addition to main chromosome, there may be one or more small sized circular double stranded DNA molecules called _____
 - a) Plastids
 - b) Phagmids
 - c) Plasmids
 - d) Phages
- 4) Doubling the chromosome number in eukaryotes is probably responsible for their _____
 - a) Greater simplicity
 - b) Greater complexity
 - c) Instability
 - d) None of the above



- 5) Gilbert (1978) found that the coding sequences in most of the eukaryotic genes are not continuous but are interrupted by non-coding sequences, known as _____
- a) Introns
 - b) Exons
 - c) Transposons
 - d) Codons
- 6) The chromosome has a constricted region called _____
- a) Centromere
 - b) Kinetochore
 - c) Primary constriction
 - d) All of these
- 7) The chromosomes which remain condensed during interphase are called _____
- a) Monochromosome
 - b) Heterochromosome
 - c) 'E' chromosome
 - d) Megachromosome
- 8) The histone core of nucleosome consists of the octamer arranged in the form of two flat tetramers of _____
- a) H2a, H2b, H3 and H4
 - b) H1, H2a, H2b and H3
 - c) H1, H2a, H2b and H4
 - d) H1, H2a, H2b, H3 and H4
- 9) _____ chromosomes were first observed by Balbiani (1881) in salivary glands of *chironomous* larva.
- a) Polytene
 - b) Lampbrush
 - c) B
 - d) Loop
- 10) RNA polymerase continues transcription until it meets a _____ sequence.
- a) Promoter
 - b) Terminator
 - c) Antitermination
 - d) Pribnow box
- 11) The promoter defines the sequence DNA needed for _____ for transcription.
- a) Transition reaction
 - b) Termination reaction
 - c) Initiation reaction
 - d) None of these



- 12) Gene conversion does not depend on _____ but is correlated with it.
- a) Crossing over
 - b) Linkage
 - c) Non-cross over
 - d) All of these
- 13) _____ of the following is a chemical mutagen.
- a) EDTA
 - b) Ethyl alcohol
 - c) EMS
 - d) TEMED
- 14) In AIDS virus the genetic material is _____
- a) DNA
 - b) Protein
 - c) RNA
 - d) Lipid
- 15) _____ type of somaclonal variation is transmitted to the next generation and hence important for crop improvement.
- a) Transient
 - b) Epigenetic
 - c) Genetic
 - d) None of these
- 16) In the case of animal protoplast fusion, inactivated _____ is needed to induce fusion.
- a) Fusogen
 - b) Agarose
 - c) Sendai virus
 - d) TMS
- 17) The technique for transferring foreign genes into plant cells and regenerating fertile transgenic plants was established by _____
- a) Kaul and Nirmala (1995)
 - b) Bevan *et al.* (1983) and Fraley *et al.* (1983)
 - c) Chu (1996)
 - d) Goy and Duesing (1995)
- 18) _____ transformation is occurred when foreign DNA is integrated into the plant nuclear or plastid genomes, expression occurs in regenerated plants and inherited in subsequent generation.
- a) Transient
 - b) Stable
 - c) Both transient and stable
 - d) No



19) A bone marrow tumour cell called _____ is used in hybridoma technology which is capable of multiplying indefinitely.

- a) Lymphocyte cell
- b) T cell
- c) Myeloma cell
- d) B cell

20) A technique, by which monoclonal antibodies are produced in specialized cells, is known as _____

- a) Transformation
- b) Hybridoma
- c) Cybridoma
- d) Drug designing

- II. What is genome ? Describe variation in size and structure of virus genome. Add a note on its origin. 20
- III. Describe the structure and organization of gene in bacteria. 20
- IV. What is crossing over ? Describe molecular mechanism of recombination. Add a note on recombination nodules. 20
- V. Describe :
- a) The methods of isolation of protoplasts with their merits and demerits. 10
 - b) Hybridoma technology. 10
- VI. Describe :
- a) Structure of chloroplast genome. 10
 - b) Markers used in molecular mapping. 10
- VII. Write short notes on **any four** of the following : 20
- a) Yeast genome
 - b) Linkage groups
 - c) Transposons
 - d) Role of Rec A, B, C, D enzymes
 - e) Somaclonal variations
 - f) Intellectual variations.
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M.Sc. (Part – II) (Semester – IV) Examination, 2014
BOTANY (Paper – XIII)
Phytogeography and Conservation Biology

Day and Date : Tuesday, 22-4-2014
Time : 3.00 p.m. to 6.00 p.m.

Total Marks : 100

- Instructions :** 1) Question 1 and 7 is **compulsory**.
2) From remaining questions attempt **any three**.
3) Figures to the **right** indicate full marks.
4) **All** questions carry **equal** marks.
5) **Draw** neat labelled diagram **wherever** necessary.

1. Write the correct answer :

20

- 1) _____ is endemic to Maharashtra.
 - a) *Ceropegiaspiralis*
 - b) *Calatropisprocera*
 - c) *Calophylluminophyllum*
 - d) *Argemonemexicana*
- 2) NGO's do _____ type of work.
 - a) Natural resource conservation
 - b) Space resource conservation
 - c) Wild life resource conservation
 - d) All of the above
- 3) Wild life conservation takes place by _____.
 - a) IUCN
 - b) WWF
 - c) IBWL
 - d) CITES
- 4) The dynamics of migration of evolution of plants is called _____.
phytogeography.
 - a) Interpretive
 - b) Descriptive
 - c) Relative
 - d) National
- 5) _____ is an exotic species.
 - a) *Partheniumhysterophorus*
 - b) *Argemonemexicana*
 - c) *Eichhorniacrassipes*
 - d) All of the above



- 6) Conservation by cryopreservation is _____
- a) Insitu conservation b) Exsitu conservation
c) Invivo conservation d) Exvivo conservation
- 7) IUCN is also called as _____
- a) Man and Biosphere program
b) World Conservation Union
c) World Conservation Consortium
d) World Wide Conservation Union
- 8) The head office of National Biodiversity Authority is at _____
- a) Chennai b) Shimla c) Imphal d) Nagpur
- 9) According to IUCN red list, the status of Red Panda (*Ailurusfulgens*) is _____
- a) Critically endangered b) Endangered species
c) Vulnerable species d) Extinct species
- 10) Agroforestry and social forestry both includes _____
- a) Production forestry b) Commercial forestry
c) Deforestation d) Plantation of trees
- 11) Chipko Movement is an example of forest conservation through _____
- a) Tehri-Garhwal district
b) Uttaranchal
c) Public awareness and participation
d) Political issue
- 12) In national park protection is provided to _____
- a) Flora only b) Flora and fauna
c) Fauna only d) Entire ecosystem
- 13) Life supporting zone on earth surface is _____
- a) Lithosphere b) Biosphere
c) Stratosphere d) Ecotone



- 14) Red data book deals with _____
- a) Maintains and publish list of endangered and endemic species
 - b) Maintains and publish list of plants that are extinct
 - c) Maintains and publish list of Animals that are extinct
 - d) Maintains and publish list of dangerous species
- 15) The restricted distribution of species in small area is called as _____
- a) Biome
 - b) Niche
 - c) Endemismd
 - d) Ectosphere
- 16) Which one of the following is an endangered species ?
- a) Cuscuta
 - b) Nepenthes
 - c) Datura
 - d) Buteasps
- 17) Age and area hypothesis was put forth by Willis in _____
- a) 1922
 - b) 1927
 - c) 1930
 - d) 1932
- 18) The genetic diversity is nothing but _____
- a) A species with large number of races and varieties
 - b) A species with similar characters
 - c) A species with unknown characters
 - d) All of the above
- 19) Trans boundary movement of ivory products is banned by _____
- a) Forest Conservation Act
 - b) Environment Protection Act
 - c) Indian Forest Act
 - d) Wildlife Protection Act
- 20) The Forest (Conservation) Act was enacted in the year _____
- a) 1986
 - b) 1974
 - c) 1980
 - d) 1972



2. Describe Phytogeographical regions of India. 20
 3. What is In-situ conservation ? Describe it with special reference to Sanctuaries and Agroforestry. 20
 4. What are hot spots ? Enlist them and add a note on Mangrove vegetation in India. 20
 5. Describe the following : 20
 - a) Seed and gene bank
 - b) Age and area hypothesis.
 6. Write notes on : 20
 - a) Role of NGOS in conservation of biodiversity
 - b) CITES 1927
 7. Write short notes on **any four** of the following : 20
 - a) Principles of Phytogeography
 - b) Wild Life Protection Act
 - c) Western ghat vegetation
 - d) Cryopreservation
 - e) Degeneration of biodiversity
 - f) RET Plants.
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M.Sc. – II (Semester – IV) Examination, 2014
BOTANY (Paper – XIV)
Plant Tissue Culture, Greenhouse Technology and Hydroponics

Day and Date : Thursday, 24-4-2014
Time : 3.00 p.m. to 6.00 p.m.

Max. Marks : 100

- Instructions:** 1) **All questions carry equal marks.**
2) **Q. 1 and Q. 7 are compulsory.**
3) **From remaining questions attempt any three.**
4) **Draw neat and labeled diagrams wherever necessary.**

1. Choose the correct answer.

20

- 1) Development of shoot and root in tissue culture is determined by
 - a) Cytokinin to auxin ratio
 - b) Enzymes
 - c) Plant nutrients
 - d) Temperature
- 2) Who could grow tomato roots successfully and develop the technique of tissue culture for the first time ?
 - a) Hilderbrandt
 - b) F. C. Steward
 - c) P. R. White
 - d) W. M. Muir
- 3) 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
- 4) Controlled release fertilizer "Osmocote" consists of
 - a) Fertilizers and resin
 - b) Fertilizers and gum
 - c) Fertilizers and tannin
 - d) Fertilizers and mucilage
- 5) Who discovered that morphogenesis in tissue culture is controlled by hormones ?
 - a) Muir et. al.
 - b) Vasil and Hilderbrandt
 - c) Skoog and Miller
 - d) Helperin and Wetherell



- 6) Application of embryo culture is
- Clonal propagation
 - Production of alkaloids
 - Overcoming hybridization barrier
 - Haploid production
- 7) In greenhouse, the heat treatment is given to soil to remove weed seeds at the temperature
- 60°C
 - 82.2°C
 - 37.8°C
 - 54.4°C
- 8) Tissue culture technique can produce indefinite number of new plants from a small parental tissue. The economic importance of this technique is in raising
- Variants through picking up somaclonal variation
 - Genetically uniform population of an elite species
 - Homozygous diploid plants
 - Development of new species
- 9) In suspension cultures elicitation can be done by
- Chitin
 - Pectin
 - U. V. light
 - All of these
- 10) Which country has developed advanced hydroponics technology due to its arid climate ?
- Sri Lanka
 - UAE
 - USA
 - Israel
- 11) An androgenic haploid plant can be converted into homozygous diploid plant through the application of
- Colchicine
 - Camphor
 - Morphine
 - All of these
- 12) Cell suspension culture is agitated at rpm of
- 120
 - 50
 - 160
 - 170
- 13) A plant raised from a single pollen grain under cultural conditions would be
- Haploid
 - Dihaploid
 - Diploid
 - None of these
- 14) Protoplast fusion is induced by which of the following treatments ?
- High voltage electric pulse
 - High pH and high Ca²⁺ concentration
 - Polyethylene glycol (PEG)
 - All of these



- 15) Ga3 is known to effect which of the following ?
- a) Suppress callus formation
 - b) Promote somatic embryo conversion
 - c) Promote shoot regeneration in some species
 - d) All of these
- 16) Which of the following hydro gels have been used for encapsulation of hydrated somatic embryos ?
- a) Sodium and potassium alginate
 - b) Carageenan and Gel-Rite
 - c) Sodium pectate and agar
 - d) All of these
- 17) Which of the following enzymes is used for obtaining protoplasts ?
- a) Macerozyme
 - b) Cellulase
 - c) Pectinase
 - d) All of these
- 18) The term hydroponics was first introduced by
- a) W. F. Gericke
 - b) W. A. Setchell
 - c) J. Woodward
 - d) D. R. Hoagland
- 19) 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
- 20) Which of the following are characteristics of an auxin ?
- a) Basipetal translocation
 - b) Delayed abscission
 - c) Involved in differentiation of Xylem
 - d) All of these
2. Give an account of different culture media ingredients and their significance. **20**
3. Explain in detail the steps involved in the production of haploid plants from anther culture. Comment on the factors affecting anther culture. **20**
4. What is clonal propagation ? Describe different steps involved in clonal propagation using shoot tip culture. **20**



5. Describe in brief : 20
- a) Fumigation in green house.
 - b) Applications of synthetic seeds.
6. Write brief notes on : 20
- a) Different growth media used in hydroponics.
 - b) Types of green house.
7. Write short notes on **any four** of the following : 20
- a) Encapsulation of synthetic seeds
 - b) Totipotency
 - c) Factors influencing morphogenesis
 - d) Culture system for secondary metabolite production
 - e) Embryo culture and embryo rescue
 - f) Somatic embryogenesis.
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M.Sc. (Part – II) (Semester – IV) Examination, 2014
BOTANY (Paper – XV)
Environmental Plant Physiology

Day and Date : Saturday, 26-4-2014

Total Marks : 100

Time : 3.00 p.m. to 6.00 p.m.

- Instructions :** 1) **All** questions carry **equal** marks.
2) Question No. **1** and **7** are **compulsory**.
3) Solve **any three** questions from the **remaining** questions.

1. Write the correct answer.

20

- 1) Reclamation of saline soils can be done by
a) CaCl_2 b) $\text{Ca}(\text{NO}_3)_2$ c) CaSO_4 d) MgSO_4
- 2) Secondary Acquired Resistance appears to result due to the production of
a) Methyl salicylate b) Elicitors
c) Phytoalexins d) Phytochelatins
- 3) SOD catalyses the reduction of _____ into H_2O_2 .
a) Superoxide b) Singlet oxygen
c) Ozone d) Molecular oxygen
- 4) _____ is a chill tolerant plant.
a) Coleus b) Dieffenbachia c) Croton d) Arabidopsis
- 5) _____ lower the osmotic potential and also water potential of cells without damaging enzyme functions.
a) Amino acids b) Sugars c) Organic acids d) Compatible solutes
- 6) _____ ions and malic acid regulate the stomatal movements.
a) Na b) K c) Mg d) Ca
- 7) Acid rain is caused by higher concentrations of _____ in the atmosphere.
a) NO_x and SO_2 b) NO_2 and O_3 c) SO_2 and O_3 d) CO_2 and SO_2

P.T.O.



- 8) Ozone depletion results in increased UV _____ in the atmosphere.
a) Filtration b) Penetration c) Absorption d) Reflection
- 9) Heat shock proteins were originally discovered in
a) Fruit fly b) Ferns c) Bryophytes d) Trees
- 10) Proline, glycine betaine and sorbitol accumulate in the cytoplasm of _____ plants.
a) Water stress resistant b) Salt stress resistant
c) Chill tolerant d) Both a and b
- 11) Salt glands are present in halophytes showing _____ phenomena.
a) Salt avoidance b) Salt evasion
c) Salt tolerance d) All of these
- 12) Autotoxicity limits the yield of perennial crops and of annual crops due to continuous
a) Monoculture b) Mixed crop culture
c) Crop rotation d) Crop weed interactions
- 13) Absorption of Fe and Mn is more under _____ pH of the soil.
a) Alkaline b) Acidic c) Highly alkaline d) Neutral
- 14) Water logging injury is caused by
a) CO₂ toxicity b) O₂ toxicity c) O₂ deficit d) CO₂ deficit
- 15) _____ is a halophyte.
a) Suaeda b) Sugarbeet c) Date palm d) Cotton
- 16) There are _____ categories of SODs depending upon the cofactors present.
a) 2 b) 3 c) 4 d) 5
- 17) Phytochelatins are considered to be the indicators of _____ stress.
a) Biotic b) Heavy metals c) Water d) Salt
- 18) There is accumulation of _____ in flood tolerant species.
a) Lactic acid b) Ethyl alcohol c) Malic acid d) Ammonia



- 19) The effect of _____ is DNA damage and anthocyanin production in plants.
- a) Light stress
 - b) UV radiations
 - c) High temperature
 - d) Low temperature
- 20) Elevated CO₂ concentration causes
- a) Increase in photosynthesis
 - b) Decrease in photorespiration
 - c) Increase in WUE
 - d) All of these
2. What is drought ? Discuss the drought resistance mechanism in xerophytes and mesophytes. 20
3. Describe the role of essential heavy metals in plants. Explain effects of their toxicity and the resistance mechanism. 20
4. Write an essay on Heat injury and heat resistance in plants. 20
5. Describe :
- a) Impact of Ozone on plant metabolism. 10
 - b) Free radicals and their scavenging. 10
6. Discuss in brief :
- a) Effect of elevated CO₂ concentration on plant metabolism. 10
 - b) Mechanism of flood tolerance. 10
7. Write short notes on **any four**. 20
- a) Hypersensitive responses
 - b) Allelochemicals
 - c) Saline soils
 - d) Halophytes
 - e) Frost injury in plants
 - f) UV radiations and plants
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M.Sc. (Part – II) (Semester – IV) Examination, 2014
BOTANY (Paper – XVI)
Crop Physiology

Day and Date : Tuesday, 29-4-2014

Total Marks : 100

Time : 3.00 p.m. to 6.00 p.m.

- Instructions :** 1) **All** questions carry **equal** marks.
2) Question No. **1** and **7** are **compulsory**.
3) Solve **any three** questions from the **remaining** questions.

1. Write the correct answer.

20

1) _____ determines the efficiency of leaves in dry matter production.

- a) Leaf Area Index b) Leaf Area Ratio
c) Net Assimilation Rate d) Relative Growth Rate

2) Stomatal closure is induced by

- a) IAA b) Kinetin c) ABA d) Ethylene

3) Leguminous crops give good response to

- a) Ammonium nitrate b) Urea
c) BGA d) Phosphate fertilizers

4) Fruit ripening in mango is found to be promoted by

- a) Ethephon b) ABA c) Polyamines d) Maleic hydrazide

5) ICRISAT is situated in

- a) Maharashtra b) Andhra Pradesh
c) Madhya Pradesh d) Uttar Pradesh

6) Nitrogen fixation in Chickpea is catalysed by

- a) Nitrate reductase b) Nitrite reductase
c) Nitrogenase d) Glutamine synthetase

P.T.O.



- 7) Young grape fruit is sour due to presence of _____ acid.
a) Citric b) Malic c) Tartaric d) Glutamic
- 8) Photoperiodism was discovered by
a) Borthwick and Hendricks b) Garner and Allard
c) Lysenko d) Cajalachan
- 9) The critical photoperiod of *Hyoscyamus* is _____ hours.
a) 11 b) 15.5 c) 13 d) 16
- 10) _____ is a weedicide and also belongs to growth hormone auxins.
a) Paraquat b) Glyphosphate
c) 2, 4 – D d) ABA
- 11) The sink capacity in cereal crops is greatly influenced by
a) Leaf area b) Leaf angle
c) Leaf No. d) No. of spikelets per panicle
- 12) C_4 plants have greater _____ use efficiency than C_3 plants.
a) K b) N c) P d) S
- 13) Source capacity is mainly controlled by
a) Transpiration b) Photosynthesis
c) Water absorption d) Respiration
- 14) Florigen, a bicomplementary complex, is responsible to induce _____ in Plants.
a) Seed germination b) Flowering
c) Fruiting d) All of these
- 15) Paraquat and atrazine affect _____ in weeds.
a) Respiration b) Transpiration
c) Water absorptions d) Photosynthesis
- 16) Vernalisation, this term was coined by
a) T.D. Lysenko b) Lang and Mulcher
c) Cajalachan d) Purvis
- 17) During fruit ripening, in case of grapes and mango, organic acids are converted into
a) Proteins b) Lipids c) Starch d) Sugars



- 18) _____ is not a growth index.
a) RGR b) NAR c) LAI d) WUE
- 19) Biofertilizers mainly improve _____ of the soil.
a) Water holding capacity b) Nutrient status
c) Microflora d) All of these
- 20) Vernalization involves exposure of plants to
a) Low temperature b) High humidity
c) Enough Oxygen d) All of these
2. Explain how flowering in crop plants is influenced by light and low temperature with suitable examples add a note on its significance. **20**
3. Define Fertilizers. Describe their types and modes of applications. **20**
4. Explain the terms – source and sink. Describe how source and sink capacity are influenced by various factors. **20**
5. Give an account of :
a) Any two crop research stations in India. **10**
b) Physiological basis of yield in sugarcane. **10**
6. Describe :
a) Methods of crop growth analysis. **10**
b) Common weedicides and their mode of action. **10**
7. Write short notes on **any four**. **20**
a) Post harvest technology of grapes
b) Water use efficiency of crops
c) Antitranspirants
d) Munch hypothesis
e) Nitrogen fixation in Chickpea
f) Role of Ca, K, Fe in groundnut
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M.Sc. – I (Semester – I) Examination, 2014
BOTANY (Paper – II) (CGPA Pattern)
Biology and Diversity of Algae, Pteridophytes and Bryophytes

Day and Date : Wednesday, 23-4-2014
Time : 11.00 a.m. to 2.00 p.m.

Max. Marks : 70

- Instructions :** i) Attempt totally **five** questions.
ii) Question No. 1 is **compulsory**.
iii) Attempt **any two** questions from Q. 2 to 4.
iv) Attempt **any two** questions from Q. 5 to 7.
v) Figures to the **right** indicate **full** marks.

1. Write the correct answer :

14

- 1) The leaves bearing antheridia in the axil are known as _____
 - a) Perigonial leaves
 - b) Perichaetial leaves
 - c) Paraphysis
 - d) Bracts
- 2) Chlorophyllous vertical plates in T.S. of leaf of *Polytrichum* are known as _____
 - a) Lamellae
 - b) Paraphysis
 - c) Mucilage hair
 - d) Slime papillae
- 3) *Azolla* is _____ fern.
 - a) Aquatic
 - b) Epiphytic
 - c) Terrestrial
 - d) Epilithic
- 4) *Lycopodium* is commonly known as _____
 - a) Clubmoss
 - b) Quillworts
 - c) Ground pine
 - d) Peat moss
- 5) 'Red Tides' are caused by the dense blooms of _____
 - a) Dianoflagellates
 - b) Phaeophytes
 - c) Rhodophytes
 - d) Cyanophytes



- 6) Wonder plasm is located in _____
a) Carpogonium of *Batrachospermum*
b) Young oogonium of *Vaucheria*
c) Oogonium of *Chara*
d) None of the above
- 7) In Jungermanniales, dehiscence of capsule takes place by splitting it into _____ valves.
a) Six b) Two c) Eight d) Four
- 8) Mosses belong to the class _____
a) Hepaticopsida b) Bryopsida
c) Anthocerotopsida d) Lycopsida
- 9) The ferns are mainly classified on the basis of _____
a) Annulus b) Indusium
c) Sori d) Sporangium
- 10) The sorus of *Gleichenia* is _____
a) Simple b) Mixed
c) Gradate d) Acropetal
- 11) The Sea lettuce is _____
a) *Enteromorpha* b) *Ulva*
c) *Spirogyra* d) *Sargassum*
- 12) Chantrelle stage is seen in the life cycle of _____
a) *Caulerpa* b) *Sirogonium*
c) *Dictyota* d) *Batrachospermum*
- 13) Sporophyte of *Buxbaumia* is _____
a) oblique b) horizontal
c) spherical d) elongated
- 14) *Salvinia* is an _____ fern.
a) Terrestrial b) Epiphytic
c) Aquatic d) Epilithic



2. Describe :
 - a) Marine algae 7
 - b) Sexual reproduction in algae. 7
 3. Give an account of :
 - a) Sphagnum as a peat 7
 - b) Phyllogeny of Anthocerotales. 7
 4. Describe :
 - a) Telome concept 7
 - b) Salient features of Psilopsida. 7
 5. Explain :
 - a) Reserved food of algae 5
 - b) Adult prothalli of fern 4
 - c) Thallus organization of Acrogynae. 5
 6. Write in brief :
 - a) Pigments in algae 4
 - b) Stele of *Lycopodium* 5
 - c) Sporophyte of *Buxbaumia*. 5
 7. Write notes on **any three** : 14
 - a) Spike of *Ophioglossum*
 - b) Strobilus of *Selaginella*
 - c) Cultivation of algae
 - d) Sporophyte of *Polytrichum*.
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M.Sc. I (Semester – I) Examination, 2014
BOTANY (Paper – IV) (CGPA Pattern)
Tools and Techniques in Botany

Day and Date : Monday, 28-4-2014

Max. Marks : 70

Time : 11.00 a.m. to 2.00 p.m.

- Instructions :** i) Attempt totally **five** questions.
ii) Question no. **1** is **compulsory**.
iii) Attempt **any two** questions from question No. **2 to 4**.
iv) Attempt **any two** questions from question No. **5 to 7**.
v) Figures to the **right** indicate **full** marks.

1. Write the correct answer.

14

- 1) For visualizing the surface architecture of a specimen _____ is used.
a) TEM b) SEM c) LEM d) CEM
- 2) _____ is used as mobile phase in gas chromatography.
a) Helium b) Oxygen c) Hydrogen d) Carbon dioxide
- 3) Poisoning of herbarium is done with
a) Mercuric chloride b) Cobalt chloride
c) Hydrogen peroxide d) Manganese chloride
- 4) _____ is used as a fixative in cytological preparations.
a) Carnoy's fluid b) FAA
c) Bials fluid d) Luria's fluid
- 5) For microphotography, microscope should have
a) External lamp b) 100 X objective lens
c) Focusing screen d) Pointer eyepiece
- 6) As the concentration of solute in solution increases, its transmittance
a) decreases b) remains constant
c) not affected d) increases

P.T.O.



- 7) In chromatographic technique the R_f value is a physical constant which is always
- a) between zero and one
 - b) above one
 - c) below zero
 - d) none of these
- 8) The standard size of herbarium sheet is
- a) 30 cm × 40 cm
 - b) 29 cm × 42 cm
 - c) 32 cm × 41 cm
 - d) 25 cm × 43 cm
- 9) Bands in Orcein banding technique of the chromosome represent _____ regions.
- a) isochromatin
 - b) heterochromatin
 - c) euchromatin
 - d) polychromatin
- 10) _____ is a measure of acidity or basicity of an aqueous solution.
- a) Weight
 - b) Molarity
 - c) Normality
 - d) pH
- 11) An excitation filter is a high quality glass filter commonly used in
- a) Fluorescence microscopy
 - b) SEM
 - c) TEM
 - d) Light microscopy
- 12) A Geiger counter is a type of particle detector that measures
- a) non-ionizing radiations
 - b) ionizing radiations
 - c) normal photons
 - d) normal hydrogen
- 13) _____ is a technique used for separating different molecules by differences in their isoelectric point.
- a) Ultracentrifugation
 - b) Isoelectric focusing
 - c) Ultraelectric focusing
 - d) Affinity chromatography
- 14) _____ is widely used for prediction and forecasting.
- a) ANOVA
 - b) Regression
 - c) Coefficient of variation
 - d) Probability



2. a) What is coefficient of variation ? Describe simple measures of variation. 7
b) Describe standard units of expression. 7
 3. a) What is cytophotometry and immuno-fluorescence microscopy ? 7
b) Describe principles and applications of SEM and TEM. 7
 4. a) Explain a technique of gel electrophoresis. 7
b) Give an account of HPLC. 7
 5. a) Write a note on flame spectrophotometry. 5
b) Describe the technique of Orcein banding. 5
c) Write a note on ESR spectroscopy. 4
 6. a) Explain effect of radiation on biological systems. 5
b) Define herbarium. Enlist important herbaria in India. 5
c) Write a note on radioisotopes. 4
 7. Write notes on **any three**. 14
 - a) Colorimetry
 - b) Permanent preparation
 - c) Half-life
 - d) Preservation of plant material.
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M.Sc. – I (Semester – II) Examination, 2014
BOTANY (New)
(CGPA Pattern) (Paper No. – V)
Biology and Diversity of Gymnosperms and Palaeobotany

Day and Date : Tuesday, 22-4-2014
Time : 11.00 a.m. to 2.00 p.m.

Max. Marks : 70

- Instructions :** i) Attempt totally **five** questions.
ii) Question No. **1** is **compulsory**.
iii) Attempt **any two** questions from question no. **2** to **4**.
iv) Attempt **any two** questions from question no. **5** to **7**.
v) Figures to the **right** indicate **full** marks.

1. Choose the correct answer from given alternatives :

14

- 1) *Canada balsam* is obtained from _____
 - a) *Cycas circinalis*
 - b) *Abie sbalsamea*
 - c) *Zamia basamea*
 - d) *Balsamina albus*
- 2) Wood of Conifers is _____
 - a) Pycnoxylic
 - b) Monoxylic
 - c) Manoxylic
 - d) Diploxylic
- 3) Incupressoid 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

P.T.O.



- 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 and secondary b) Primary and lateral
c) Young and mature d) Long school and 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 and shows presence of _____ tissue.
- a) Epiblema b) Cuticular c) Transfusion d) Hairy
- 11) Triangular portions in the leaf cushion is _____
- a) Leaf cushion b) Leaf scar
c) Upper pericnos d) Lower pericnos scar
- 12) The first account of Psilophytales was given by
- a) Mackie b) Kidston and Lang
c) Sir William Dawson d) Krausel and Hirmar
- 13) Leaf cushion arrangement of stem of *Sigillaria* appears to be _____
- a) Circular b) Conical
c) Spiral d) Square
- 14) _____ is a stem genus.
- a) Lyginopteris b) Kaloxylon
c) Sphenopteris d) Lagenostoma



2. a) Discuss Applied Aspects of Gymnosperms. 7
b) Give evolutionary trends in megasporophylls. 7
 3. a) Give Spornes classification of Gymnosperms. 7
b) Give a brief account of order Benettitales. 7
 4. a) Salient features of Cycadales. 7
b) Describe the palaeobotanical techniques used in fossil studies. 7
 5. Describe :
 - a) Anatomy of Ginkgo stem 5
 - b) Male flower of Ephedra 5
 - c) Reproductive organs of Taxus. 4
 6. Explain :
 - a) Types of fossils 5
 - b) Anatomy of Lepidodendron 5
 - c) Lower Gondwana fossil flora of India. 4
 7. Write notes on **any three** : 14
 - a) Canada Balsam
 - b) Coralloid roots
 - c) Process of fossilization
 - d) Pycnoxylic wood.
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**M.Sc. – I (Semester – II) Examination, 2014
BOTANY (Paper – VI) (New) (CGPA Pattern)
Taxonomy of Angiosperms**

Day and Date : Thursday, 24-4-2014
Time : 11.00 a.m. to 2.00 p.m.

Max. Marks : 70

- Instructions :** i) Attempt totally **five** questions.
ii) Question no. **1** is **compulsory**.
iii) Attempt **any two** questions from question no. **2** to **4**.
iv) Attempt **any two** questions from question no. **5** to **7**.
v) Figures to the **right** indicate **full** marks.

1. Rewrite the following sentences by choosing correct alternative : **14**
- 1) In Ranunculaceous type of stomata guard cells are surrounded by _____
 - a) Specialized subsidiary cells
 - b) Ordinary epidermal cells
 - c) Specialized epidermal cells
 - d) Ordinary subsidiary cells
 - 2) When pollination is carried out by beetles, it is called as _____
 - a) Anemophily
 - b) Entomophily
 - c) Cantharophily
 - d) Ornithophily
 - 3) Flora of Marathwada is the work of _____
 - a) M. A. Wadood Khan
 - b) V. N. Naik
 - c) P. Lakshminarasimhan
 - d) S. R. Yadav
 - 4) In most of the angiosperms including primitive ones, have _____ type of ovules.
 - a) Orthotropous
 - b) Amphitropous
 - c) Anatropous
 - d) Campylotropous
 - 5) Trinucleate pollen is a characteristic feature of the taxa of _____
 - a) Magnoliales
 - b) Caryophyllales
 - c) Trochodendrales
 - d) Myricales



- 6) Genus *Vallisneria* is classified under family _____
- Lythraceae
 - Onagraceae
 - Hydrocharitaceae
 - Tiliaceae
- 7) An isotype is any duplicate of the _____
- Lectotype
 - Neotype
 - Holotype
 - None of the above
- 8) Presence of moniliform hairs on stamens is feature of family _____
- Orchidaceae
 - Commelinaceae
 - Urticaceae
 - Cyperaceae
- 9) _____ type of germination is supposed to be advanced in flowering plants.
- Hypogeal
 - Epigeal
 - Perigeal
 - Syngeal
- 10) *Piper betel* L. belongs to family _____
- Urticaceae
 - Myrtaceae
 - Commelinaceae
 - None of the above
- 11) Mangroves are growing in _____ ecosystem.
- Riverine
 - Estuarine
 - Grassland
 - None of the above
- 12) Which one of the following is belonging to the sub-class Hamamelidae ?
- Magnoliaceae
 - Geraniaceae
 - Sapotaceae
 - Urticaceae
- 13) '*Evolution and Classification of Flowering Plants*' is written by _____
- A. Cornquist
 - G. Bentham
 - C. V. Linnaeus
 - J. D. Hooker
- 14) Taxonomic group of any rank within the system is termed as _____
- Division
 - Taxon
 - Family
 - Genus



2. a) Write merits and demerits of Cronquist's systems of classification. 7
b) Write in brief the principles of ICBN. 7
 3. a) Give an account of evolutionary trends in inflorescence. 7
b) What is typification ? Describe various nomenclatural types. 7
 4. a) Write vegetative and floral characters of Magnoliaceae along with interrelationship. 7
b) Give an account of Biodiversity hotspots of India. 7
 5. a) Biodiversity hotspots. 5
b) Discuss principles of taxonomy. 5
c) Principle of priority of publication. 4
 6. a) Orchid flower. 5
b) Floristic work in Maharashtra. 5
c) Aims of Taxonomy. 4
 7. Write notes on **any three** : 14
 - a) Evolutionary trends in stomatal apparatus.
 - b) Biological species.
 - c) Salient features of polygonaceae.
 - d) Salient features of commelinaceae.
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M.Sc. I (Semester – II) Examination, 2014
BOTANY (New) (CGPA Pattern)
Paper – VII : Cell and Molecular Biology of Plants

Day and Date : Saturday, 26-4-2014
Time : 11.00 a.m. to 2.00 p.m.

Max. Marks : 70

- Instructions :** i) Attempt totally **five** questions.
ii) Question No. **I** is **compulsory**.
iii) Attempt **any two** questions from Question No. **II** to **IV**.
iv) Attempt **any two** questions from Question No. **V** to **VII**.
v) Figures to the **right** indicate **full** marks.

I. a) Choose the correct answer :

7

- 1) Non-expressed regions of the DNA are called as
a) introns b) exons c) sat-DNA d) r-RNA
- 2) M phase kinase has _____ as a subunit.
a) RNA b) DNA c) Cyclin d) PO₄
- 3) In chloroplast the protons are translocated across the thylakoid membrane and accumulate inside the
a) grana b) thylakoid sac
c) stroma d) intergrana
- 4) Water-loving domains of plasma membrane are known as
a) hydrophobic b) hydrophilic
c) hygroscopic d) lithophilic
- 5) Terminology of introns and exons is given by
a) Chaw *et al* b) Walter Gilbert
c) Berget *et al* d) Sharp and Roberts
- 6) Each type of the cytoskeletal filament is constructed from smaller _____ subunits.
a) Nucleic acid b) Protein c) Lipoprotein d) Sugar

P.T.O.



7) Mitochondrial DNA codes for their own _____

- a) r RNAs
- b) t RNAs
- c) Proteins
- d) r RNAs, t RNAs and proteins

b) Fill in the blanks :

7

1) _____ is a termination codon.

2) Filaments found in cells are of two types viz. microfilaments and _____

3) The damaged part of the DNA strand is removed by an _____ enzyme.

4) The phenomenon of programmed cell death is called as _____

5) Genetic code was deciphered through the experiments of scientist _____

6) The period between two mitotic cycles is called _____

7) _____ are path-like areas of close intercellular contact, consists of several hollow cylindrical particles on each cell membrane.

II. Write in short about :

a) Plasma membrane

7

b) Plasmodesmata.

7

III. Discuss in short about :

a) Chloroplast genome

7

b) Ultrastructure of mitochondrion.

7

IV. Explain briefly :

a) Structure and function of tonoplast.

7

b) Methods of DNA detection.

7



V. Comment upon :

- a) Genetic code. 5
- b) Structure of microtubules. 5
- c) Endoplasmic reticulum. 4

VI. Comment upon :

- a) Cyclins 5
- b) Apoptosis 5
- c) Cell plate formation. 4

VII. Write notes on **any three** of the following : 14

- a) Confocal microscopy
 - b) Enzyme regulation
 - c) Immunotechniques
 - d) GISH.
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**M.Sc. I (Semester – II) Examination, 2014
BOTANY (CGPA Pattern) (Paper – VIII)
Advances in Plant Pathology
(New)**

Day and Date : Tuesday, 29-4-2014
Time : 11.00 a.m. to 2.00 p.m.

Max. Marks : 70

- Instructions :**
- 1) Attempt **five** questions.
 - 2) Question No. **1** is **compulsory**.
 - 3) Attempt **any two** questions from Section **II** and **any two** from Section **III**.
 - 4) Answer to all the **3** Sections should be in the **same** answer book.
 - 5) Figures to the **right** indicate **full** marks.

SECTION – I

I. Select the correct answer :

14

- 1) _____ is the common stain used for fungal preparations.
 - a) Aniline blue
 - b) Methylene blue
 - c) Safranin
 - d) Cotton blue
- 2) Irregular mottling is the symptom associated with
 - a) Non parasitic disease
 - b) Viral disease
 - c) Bacterial disease
 - d) Both b and c
- 3) _____ disease is caused by Xanthomonas citri.
 - a) Citrus Canker
 - b) Die back disease
 - c) Angular leaf spot of cotton
 - d) Blast of Rice
- 4) Red rot of sugarcane is caused by
 - a) Colletotrichum fulcatum
 - b) Colletotrichum Sacchari
 - c) Ustilago Scitaminae
 - d) Albugo bliti

P.T.O.



SECTION – II

- II. a) What are various methods of forecasting ? 7
- b) What are the aims and objectives of seed pathology ? 7
- III. a) Describe the role of moisture and temperature in disease occurrence. 7
- b) Discuss morphological and anatomical adaptations occur in host to prevent entry and movement of pathogens. 7
- IV. a) What are the changes occur in host during penetration and post penetration ? 7
- b) What is meant by crop loss in relation to plant pathology ? 7

SECTION – III

- V. a) What are the symptoms of fungal diseases ? 5
 - b) Describe the club root of crucifers. 5
 - c) Differentiate between primary and secondary inoculum. 4
 - VI. a) Give the structural features of bacteria. 5
 - b) What is epidemiology and explain pandemic and sporadic diseases. 5
 - c) Give preparation and importance of boardeux mixture. 4
 - VII. Write notes on **any three** : 14
 - a) G.S.D.
 - b) Chemical protectants.
 - c) Red rust of tea.
 - d) B.M.V.
-