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M.Sc. – I (Semester – I) Examination, 2016
BOTANY (Paper – III)
Plant Ecology (CBCS New)

Day and Date : Saturday, 2-4-2016

Max. Marks : 70

Time : 10.30 a.m. to 1.00 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. Choose the correct answer from given alternatives : **14**
- 1) Succession require
 - a) some years
 - b) five years
 - c) thousand of years
 - d) couple of year
 - 2) WWF was established in the year
 - a) 1961
 - b) 1971
 - c) 1981
 - d) 1951
 - 3) The last IUCN congress has held on _____ at Bankok.
 - a) 14th October 04
 - b) 14th November
 - c) 14th September
 - d) 14th October 05
 - 4) Man and Biosphere is shortly abbreviated as
 - a) MBS
 - b) MAB
 - c) Mab
 - d) MBI
 - 5) When succession initiates on acidic soil, it is called as
 - a) xerosere
 - b) halosere
 - c) oxalosere
 - d) psamosere
 - 6) In aqueous environment the microscopic organisms are collectively known as
 - a) fauna
 - b) plankton
 - c) herbivores
 - d) a) and c)
 - 7) Polyclimax theory was putforth by
 - a) Tanslyet al
 - b) Clements
 - c) Wittakaret al
 - d) Mishra et al
 - 8) Succession always tends towards the
 - a) xerism
 - b) mesism
 - c) hydrism
 - d) all the above



- 9) The succession occurs under the influence of external factors such as climate, edaphic factor etc. is called as _____ succession.
 a) primary b) autogenic c) allogenic d) sub climax
- 10) The concept of ecological pyramid was proposed by
 a) Odum b) Charles Elton c) Verma d) Misra
- 11) The key attributes of wetlands are
 a) hydric soil b) hydrology c) hydrophytes d) all the above
- 12) Wetland ecosystems are _____ significant.
 a) economically b) ecologically c) sociologically d) all the above
- 13) RESOURCESAT is a _____ satellite.
 a) IRS b) NIR c) IR d) TIRA
- 14) PMT detectors are used in _____ range.
 a) Near IR b) IR c) Thermal IR d) Visible
2. a) What are wetlands ? Give the key attributes of wetlands. 7
 b) Explain the importance of EIA. 7
3. a) Write briefly on phytovolatilization. 7
 b) Give applications of remote sensing techniques. 7
4. a) Explain the causes of ozone depletion. 7
 b) Discuss the importance of environmental toxicology. 7
5. Write briefly on :
 a) Lentic water bodies. 5
 b) Estuarine ecosystem. 5
 c) Soil pollution 4
6. a) Describe various stages of succession with examples. 5
 b) Describe the methods used in monitoring water pollution. 5
 c) Define bioaccumulation. Represent the phenomenon with example. 4
7. Write notes on **any three** : 14
 a) IRS Series
 b) Xenobiotics
 c) Phytoextraction
 d) Rise in temperature.
-



2. a) Explain the diversity of gymnosperms with respect to reproduction. 7
b) Describe Indian fossil flora. 7
 3. a) Give economic importance of Order Cycadales. 7
b) Describe family Osmundaceae. 7
 4. a) Reproductive structure of Welwitschia. 7
b) Family Rhyniaceae. 7
 5. Describe :
a) Male cone of Ginkgo. 5
b) Wood of Conifer. 5
c) Medullosa thompsoni. 4
 6. Explain :
a) Female cone of Araucaria. 4
b) Lepidocarpon. 5
c) Lyginopteris. 5
 7. Write note on **any three** : 14
a) Male cone of Podocarpus
b) Aril
c) Petrification
d) Coal maceration.
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Seat No.	
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M.Sc. I (Semester – II) (NEW CBCS) Examination, 2016
BOTANY (Paper – VI)
Taxonomy of Angiosperms

Day and Date : Friday, 1-4-2016
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

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

SECTION – I

1. Rewrite the following sentences by choosing correct alternative. **14**
- 1) '*Evolution and Classification of Flowering Plants*' is written by _____
a) A. Cornquist b) G. Bentham c) C. V. Linnaeus d) J.D. Hooker
 - 2) Taxonomic group of any rank within the system is termed as _____
a) division b) family c) taxon d) genus
 - 3) Genetic diversity represents the _____ variation within and between populations of organisms.
a) heritable b) endemic c) species d) none of these
 - 4) In Cronquist system of classification _____ in dicotyledons and _____ in monocotyledons are generally regarded as advanced families.
a) Winteraceae, Liliaceae b) Magnoliaceae, Burmanniaceae
c) Primulaceae, Irideae d) Asteraceae, Orchidaceae
 - 5) 'Labellum' petal is present in the family _____
a) Moraceae b) Orchidaceae c) Onagraceae d) Poaceae



- 6) Spot out the statement applicable to Caryophyllaceae _____
a) Zygomorphic flower b) Cincinus inflorescence
c) Inferior ovary d) Winged fruits
- 7) _____ type of germination is supposed to be advanced in flowering plants.
a) Hypogeal b) Epigeal c) Perigeal d) Syngaeal
- 8) Mangroves are growing in _____ ecosystem.
a) Riverine b) Estuarine
c) Grassland d) None of the above
- 9) Name of the sub-family has the suffix _____
a) – oideae b) – aceae c) – eae d) – inae
- 10) In Cornquist system of classification Monocotyledons is replaced by
a) Magnoliopsida b) Lilidae c) Liliopsida d) Dilleniidae
- 11) _____ taxa form important units for identifying and prioritizing protected area.
a) Endangered b) Rare c) Threatened d) Endemic
- 12) Mucilage cells are found both in the pith and cortical regions of the members of family _____
a) Cactaceae b) Malvaceae c) Poaceae d) None of these
- 13) Flora of Solapur is the work of _____
a) S.P. Gaikwad and K.U. Garad b) V.N.Naik and S.R. Yadav
c) P. Lakshminarasimhan d) S.R.Yadav and M.M. Sardesai
- 14) An isotype is any duplicate of the _____
a) Lectotype b) Holotype c) Neotype d) Paratype

SECTION – II

2. a) Write in brief the principles of ICBN. 7
b) Outline of Bessey's system of classification. 7



- | | |
|---|---|
| 3. a) Give an account of evolutionary trends in Androecium. | 7 |
| b) What is typification ? Describe various nomenclatural types. | 7 |
| 4. a) Comment up on account of Biodiversity hotspots of India. | 7 |
| b) General evolutionary trends in fruits. | 7 |

SECTION – III

- | | |
|---|----|
| 5. a) Principle of priority of publication. | 5 |
| b) Functions of taxonomy. | 5 |
| c) Orchid flower. | 4 |
| 6. a) Morphological characters of Sapotaceae. | 5 |
| b) Reproductive characters of Tiliaceae. | 5 |
| c) Systematic position of Polygoniaceae. | 4 |
| 7. Write notes on any three . | 14 |
| a) Omega taxonomy | |
| b) Binomial nomenclature | |
| c) Economic value of Biodiversity | |
| d) Floristic work in Maharashtra. | |
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Seat No.	
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M.Sc. – I (Semester – II) (New CBCS Pattern) Examination, 2016
BOTANY (Paper – VII)
Cell and Molecular Biology of Plants

Day and Date : Monday, 4-4-2016
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

- Instructions :** 1) Question No. 1 is **compulsory**.
2) Solve **any two** questions from Q. 2 to Q. 4 and **any two** from Q. 5 to Q. 7.
3) Figures to the **right** indicate **full** marks.
4) Draw **neat** and labelled diagrams **wherever** necessary.

1. Write the correct answer.

14

- 1) G-actin are the protein building blocks of
 - a) Microtubules
 - b) Microfilaments
 - c) ER
 - d) Golgi bodies
- 2) Retinoblastoma is an hereditary _____ cancer due to deletion in specific region of chromosome 13 from one of the parents.
 - a) eye
 - b) liver
 - c) spleen
 - d) bone
- 3) Cell plate formation is due to
 - a) ER
 - b) Microtubules
 - c) Golgi vesicles
 - d) Microfilaments
- 4) In a solenoid model of nucleosome, _____ nucleosomes are packed together per turn.
 - a) three
 - b) four
 - c) five
 - d) six
- 5) _____ are involved in apoptosis.
 - a) caspases
 - b) proteases
 - c) kinases
 - d) oxidases



- 6) Ribosomes require high levels of _____ for their stability.
a) calcium b) magnesium c) iron d) manganese
- 7) In confocal microscopy, sample image is obtained from
a) focal plane of objective b) photographic film
c) TV camera d) digital image
- 8) Origin and biogenesis of mitochondria by division from mitochondria has been studied in
a) Puccinia b) Uncinula c) Aspergillus d) Neurospora
- 9) Smooth ER plays an important role in the synthesis of
a) proteins b) glycogen
c) lipids d) polysaccharides
- 10) Replicon model for DNA replication was formulated by _____ in 1963.
a) Watson and Crick b) Hargovind Khorana
c) Brenner and Cuzin d) Meselson and Stahl
- 11) _____ is not a function of vacuole.
a) Storage of organic compounds b) Osmoregulation
c) Turgidity of the cell d) ATP synthesis
- 12) Replication of lagging strand generates small polynucleotide sequences called as
a) replicons b) okazaki fragments
c) primers d) primosome
- 13) There are _____ types of caspases.
a) three b) five c) six d) eight
- 14) _____ method can be used to detect different antigens from same sample.
a) Agglutination b) Precipitation
c) Immunofluorescence assay d) RIA



2. Write an essay on-DNA Damage and Repair. 14
 3. Describe the ultrastructure of mitochondrion and add a note on its genome organisation. 14
 4. Give an account of plasma membrane w.r.t. its structure, chemical composition, models and functions. 14
 5. Briefly explain :
 - a) Models of DNA replication. 7
 - b) Cell cycle and its regulation. 7
 6. a) Enumerate the properties of genetic code. 7
b) Give the functions of microtubules and ER. 7
 7. Write short notes on **any three** : 14
 - a) In situ hybridization technique.
 - b) Chromosomal organization.
 - c) Retinoblastoma.
 - d) Plant vacuoles.
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Seat No.	
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M.Sc. – I (Semester – II) Examination, 2016
BOTANY (New CBCS)
Paper – VIII : Advances in Plant Pathology

Day and Date : Wednesday, 6-4-2016

Max.Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

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

1. Select the correct answer :

14

- The literature on the genetics of disease resistance in vegetables has been reviewed by Walker in
a) 1965 b) 1975 c) 1995 d) 1985
- The quarantine laws were first enacted in the _____ in 1912.
a) Australia b) USA c) India d) Zambia
- Powdery mildew of grapevines disease was reported from _____ in 1847.
a) Peru b) Brazil c) England d) Mexico
- Club root of crucifers was first described by Woronin in
a) 1873 b) 1875 c) 1886 d) 1877
- In 1958 _____ in Germany had defined plant disease.
a) Julius Kuhn b) Mulius Kuhn
c) Delius Kuhn d) Belius Kuhn
- Grassy shoot disease was first noticed in India in _____ in Maharashtra State.
a) 1818 b) 1919 c) 1717 d) 1616
- _____ is the example of Phytoplasma disease.
a) MSD b) DSD c) GSD d) OSD
- The host of the major species of root knot of _____ include at least 1700 plants.
a) nematode b) algal c) bacteria d) viral



- 9) Percentage of all produce lost disease, insect and weed are 25 in
 a) Africa b) Europe c) Australia d) Asia
- 10) The effect of environmental factor on plant disease has been reviewed by Colhoun in
 a) 1973 b) 1974 c) 1975 d) 1976
- 11) The example of phanerogamic disease are _____ parasite.
 a) bark b) root c) leaves d) flower
- 12) Citrus canker is the example of _____ disease.
 a) viral b) fungal c) mycoplasma d) bacterial
- 13) The club root is the example of _____ disease.
 a) fungal b) bacterial c) algal d) phanerogamic
- 14) _____ et. al. in 1989 tried to put up a moderately precise definition of disease.
 a) Saxena b) Singh c) Nanir d) Sharma
2. a) Explain the classification of plant disease based on symptoms. 7
 b) What is smut ? Describe the smut disease studied by you. 7
3. a) What is pathogen ? Give the methods of diagnosis of plant diseases. 7
 b) Define virus and explain symptoms, causal organism, disease cycle and control measures of TMV. 7
4. a) Describe the eradication methods of plant disease control. 7
 b) Explain the physiological defense mechanism studied by you. 7
5. a) Explain the symptoms, causal organism and control measures of partial stem parasite disease. 5
 b) Describe the symptoms, causal organism and control measures of downy mildew disease studied by you. 5
 c) Write the uses of organic compound in chemical control of plant diseases. 4
6. a) Explain the systematic acquired resistance studied by you. 5
 b) Give the symptoms, causal organism and control measures of fruit rot disease. 5
 c) Write the identification technique of MLO. 4
7. Write notes on **any three** : 14
 a) Importance of plant diseases b) Rapid epiphytotic
 c) Penetration d) Protection
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M.Sc. – I (Semester – II) (Old CGPA) Examination, 2016
BOTANY (Paper – VI)
Taxonomy of Angiosperms

Day and Date : Friday, 1-4-2016

Max. Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

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

SECTION – I

1. Rewrite the following sentences by choosing correct alternative. **14**
- 1) _____ have defined the species of biosystematists in terms of gene exchange.
- a) Bentham and Hooker b) Valentine and Love
c) Grant and Love d) Meyer and Pristely
- 2) The constant presence of an ochrea (Sheathing stipule) is the most characteristic feature of the family
- a) Caryophyllaceae b) Asteraceae
c) Orchidaceae d) Polygoniaceae
- 3) "Species Plantarum" is written by
- a) A. Cornquist b) G. Bentham c) J.D. Hooker d) C.v. Linnaeus
- 4) Presence of resin and oil secreting sacs in the epidermis and ground tissue are found in members of family
- a) Piperaceae b) Myrtaceae c) Sapotaceae d) Araceae
- 5) When pollination is carried out by wind, it is called as
- a) Anemophily b) Entomophily c) Cantharophily d) Ornithophily



- 6) Spot out the statement which is false for Zingiberaceae
- Usually the roots are thick and fleshy
 - The venation is parallel
 - The bracts are spirally arranged
 - Pollination takes place through the agency of water (Hydrophily)
- 7) *Ficus krishnae* C. DC. is altered to the rank variety as *Ficus benghalensis* L. var. *krishnae* by Corner, what will be the correct citation for such taxon ?
- Ficus krishnae* C. DC. var *benghalensis* (L.) Corner
 - Ficus benghalensis* L. var. *krishnae* (C. DC.) Corner
 - Ficus benghalensis* L. var. *krishnae* (L.) Corner
 - Ficus benghalensis* Corner, var. *krishnae* (L.) C. DC.
- 8) Epiphytic plants are found in the family
- Orchidaceae
 - Araceae
 - Hydrocharitaceae
 - Both a and b
- 9) Majority of the present-day phylogenists consider angiosperms have first developed in
- Temperate
 - Moist tropics
 - Arctic
 - Polar
- 10) _____ family has vessel-less wood, and placed at the beginning of dicotyledons in Cronquist's system of classification.
- Commelina
 - Winteraceae
 - Zingiberaceae
 - None of these
- 11) Fruits of angiosperms are variously classified as
- Simple or Compound
 - Dry or Fleshy
 - Dehiscent or Indehiscent
 - All of these
- 12) _____ is the newly described taxon from Solapur district of Maharashtra, India by Gaikwad *et al.* in 2014.
- Vigna yadavii*
 - Crinum solapurense*
 - Astrea lobata*
 - Dreamea congesta*
- 13) If the specific epithet repeats exactly the generic name then it is
- Homonym
 - Synonym
 - Tautonym
 - Superfluous name
- 14) Trinucleate pollen grain is characteristic of the members of
- Ranales
 - Rosales
 - Malvales
 - None of these



SECTION – II

- 2. a) Outline of Cronquist's system of classification. 7
- b) Discuss evolutionary trends in flower. 7
- 3. a) Explain principle of priority. 7
- b) Write vegetative and floral characters of family Casurinaceae along with interrelationships. 7
- 4. a) Explain various nomenclatural types. 7
- b) Biodiversity hotspots. 7

SECTION – III

- 5. a) Write criteria for effective and valid publication. 5
 - b) Discuss principles of taxonomy. 5
 - c) Floristic work in Maharashtra. 4
 - 6. a) Numerical taxonomy. 5
 - b) Typological species concept. 5
 - c) Orchid flower. 4
 - 7. Write notes on **any three**. 14
 - a) Genetic diversity in plants.
 - b) Salient features of Commelinaceae.
 - c) Aims of taxonomy.
 - d) Salient features of Orchidaceae.
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M.Sc. – I (Semester – II) (Old CGPA) Examination, 2016
BOTANY (Paper – VII)
Cell and Molecular Biology of Plants

Day and Date : Monday, 4-4-2016
Time : 10.30 a.m. to 1.00 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) Every cell has very thin surrounding membrane called as _____, which makes it self contained and to some extent self sufficient.
- a) plasma membrane b) cell membrane
c) cytoplasmic membrane d) cell membrane
- 2) Lipid molecules in plasma membrane share an important property known as _____
- a) Epipathic b) Hypopathic
c) Amphipathic d) Monopathic
- 3) In normal liver cell there are _____ mitochondria.
- a) 500 – 800 b) 1000 – 1600
c) 2000 – 2200 d) 50 – 100
- 4) The unit membrane model was put forward by _____
- a) Robertson (1953)
b) Harvey and Cole (1931)
c) Benson (1966)
d) Linard and Singer (1967)



5) Non-expressed regions of the DNA are called as _____

- a) introns
- b) exons
- c) sat-DNA
- d) r-RNA

6) Mitochondrial DNA codes for their own _____

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

7) The major protein of chloroplasts is _____

- a) RuBPCase
- b) Kinase
- c) Helicase
- d) None of the above

b) Fill in the blanks :

7

1) The cytoplasm of all eukaryotic cells contains hollow fibrillar structures called _____

2) Synthesis of energy rich compounds which provide energy for mitosis and synthesis of proteins, takes place at the end of _____ phase.

3) The period between two mitotic cycles is called _____

4) The microtubules has outer diameter of _____

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

6) The long term of PAGE is _____

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

II. Write in short about :

a) Plasma membrane.

7

b) Role of plasmodesmata.

7

III. Discuss in short about :

a) Genome organization in chloroplast.

7

b) Ultra structure of mitochondria.

7



IV. Explain briefly :

- a) Structure of vacuole and ATPases. 7
- b) Methods of DNA detection. 7

V. Comment upon :

- a) Endoplasmic reticulum. 5
- b) Golgi bodies. 5
- c) Properties of genetic code. 4

VI. Comment upon :

- a) Retinoblastoma. 5
- b) Apoptosis. 5
- c) GISH. 4

VII. Write notes on **any three** :

14

- a) FISH
 - b) Enzyme kinetics
 - c) Immunotechniques
 - d) Cell plate formation.
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Seat No.	
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M.Sc. – II (Semester – III) (CGPA) (Old) Examination, 2016
BOTANY (Paper – XI)
Advances in Plant Metabolism and Biochemistry

Day and Date : Saturday, 2-4-2016

Max. Marks : 70

Time : 2.30 p.m. to 5.00 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. Multiple choice questions :

14

- a) Enzymes of the krebs cycle or TCA cycle are located in the matrix of mitochondria except one which is located in the inner mitochondrial membrane. Name the same enzyme.
- i) Citrate synthase
 - ii) Succinate dehydrogenase
 - iii) Malate dehydrogenase
 - iv) A keta glutarate dehydrogenase
- b) Conversion of pyruvic acid in to ethyl alcohol is facilitated by the following enzymes
- i) Carboxylase
 - ii) Phosphotase
 - iii) Dehydrogenase
 - iv) Carboxylase and Dehydrogenase
- c) Malic acid is a _____
- i) Carboxylic acid
 - ii) Dicarboxylic acid
 - iii) Mono carboxylic acid
 - iv) Tri carboxylic acid
- d) Which of the following is C4 plant ?
- i) Rose
 - ii) Sugarcane
 - iii) Maka
 - iv) China rose
- e) _____ & _____ are the major precursors of oxalic acid in plants.
- i) Glycoxylate and L. ascorbic acid
 - ii) Glycoxylate and pyruvate
 - iii) L. ascorbic acid and malate
 - iv) Pyruvate and malate

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- f) _____ is the sulphur containing amino acid.
- i) Glutathione
 - ii) Alanine
 - iii) Arginine
 - iv) Aspartic acid
- g) _____ is the carbohydrate metabolic pathway.
- i) Shikmic acid pathway
 - ii) Alpha oxidation pathway
 - iii) Glycogenesis
 - iv) None of these
- h) In biological system, an important enzyme involved in regulation of redox reaction is _____
- i) Amylase
 - ii) Methylase
 - iii) Dehydrogenase
 - iv) Acyltransferase
- i) Which of the following is not intermediate of glycolysis ?
- i) Glucose-6-phosphate
 - ii) Fructose 1, 6, biphosphate
 - iii) Fructose-6-phosphate
 - iv) Glycerol-3-phosphate
- j) Ascorbic acid synthesized from _____
- i) Maltose
 - ii) Glucose
 - iii) Guanosine diphosphate-mannose
 - iv) Fructose di phosphate
- k) Succinyl Co.A. is cleaved by _____
- i) Succinate dehydrogenase
 - ii) Succinate thiokinase
 - iii) Succinate lyase
 - iv) Succinate thioesterase
- l) Respiratory enzymes are located in _____
- i) Mitochondrial matrix
 - ii) Cristae
 - iii) Perimitochondrial space
 - iv) Outer membrane
- m) The F₀-F₁ particles are found on _____
- i) Matrix side of inner mitochondrial membrane
 - ii) Inter membrane of inner mitochondrial membrane
 - iii) Inter membrane space side of outer mitochondrial membrane
 - iv) The outer surface of outer mitochondrial membrane
- n) Which of the following is the secondary metabolite ?
- i) Carbohydrates
 - ii) Alkaloids
 - iii) Protein
 - iv) None of these



2. A) Schematically represent and explain ETC. 7
B) Explain in brief biosynthesis of aromatic amino acid. 7
 3. A) Write the schematic representation of cyclic and non cyclic photophosphorylation, show the path of electrons and the sites of ATP generation. 7
B) Describe in brief integration of major metabolic pathways in plants. 7
 4. A) Explain gluconeogenesis and give its significance. 7
B) Define metabolism and explain in brief metabolism and role of oxalic acid. 7
 5. A) What is meant by kranz anatomy ? Explain and mention one example. 5
B) List five differences between C3 and C4 plants. 5
C) Explain pentose phosphate pathway. 4
 6. A) Describe respiratory inhibitors. 5
B) Describe photorespiration and its significance. 5
C) Draw a labeled diagram of ultrastructure of mitochondria. 4
 7. Write notes on **any three** : 14
A) Describe forms of sulphate in soil and plants.
B) Describe biosynthesis of methionine and give its role.
C) Give schematic representation of shikmic acid pathway.
D) Explain the role of pyrophosphate in plant metabolism.
-



- 6) Hunting of wildlife animals are strictly prohibited under the following Act.
- a) Biological Diversity Act
 - b) The Wildlife Protection Act
 - c) Forest Conservation Act
 - d) CITES
- 7) 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
- 8) _____ is declared as the International year of biodiversity.
- a) 2010
 - b) 2020
 - c) 2015
 - d) 2025
- 9) All the different kinds of living things found in a convinced habitat is called as _____
- a) Genetic diversity
 - b) Population diversity
 - c) Species diversity
 - d) Ecological diversity
- 10) Threatened species are documented in _____
- a) Rare plants of India
 - b) Endemic flowering plants of Maharashtra
 - c) Ethnobiology of India
 - d) Red Data Book
- 11) 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
- 12) The species conserve within its natural habitat means _____ conservation.
- a) Ex-situ
 - b) In-situ
 - c) In-vivo
 - d) In-vitro
- 13) _____ is the endemic plant species on Kas plateau.
- a) *Rotala serpyllifolia*
 - b) *Anagallis pumila*
 - c) *Crypsis aculeata*
 - d) *Rotala sahyadrica*



- 14) 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

SECTION – II

- 2. Biodiversity hotspots of India. 14
- 3. Western Ghat's vegetations. 14
- 4. Mangroves vegetations of India. 14

SECTION – III

- 5. a) Comment up on endemism. 7
b) Seed banks. 7
 - 6. a) Role of biotechnology in conservation of biodiversity. 7
b) Biosphere reserves. 7
 - 7. Write notes on **any three** : 14
 - a) Forest Conservation Act
 - b) Sacred grooves
 - c) Threatened plant species
 - d) National parks.
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Seat No.	
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M.Sc. (Part – II) (Semester – IV) Examination, 2016
BOTANY (Paper – XIV) (CGPA) (New)
Plant Tissue Culture and Green House Technology and Hydroponics

Day and Date : Friday, 1-4-2016

Max. Marks : 70

Time : 2.30 p.m. to 5.00 p.m.

- Instructions:** i) Attempt **total five** questions.
ii) Q. 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 correct answer from given alternatives (MCQ) : **14**
- 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



2. Give an account of different culture media ingredients and their significance. **14**
 3. A) Explain in detail the steps involved in the production of haploid plants from anther culture. **7**
B) Comment on the factors affecting anther culture. **7**
 4. A) What is clonal propagation ? Describe different steps involved in clonal propagation using shoot tip culture. **7**
B) Heating in green house. **7**
 5. Describe in brief :
A) Fumigation in green house. **7**
B) Applications of synthetic seeds. **7**
 6. Write brief notes on :
A) Different growth media used in hydroponics. **7**
B) Types of green house. **7**
 7. Write short notes on **any three** of the following : **14**
A) Encapsulation of synthetic seeds.
B) Totipotency.
C) Factors influencing morphogenesis.
D) Culture system for secondary metabolite production.
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**M.Sc. (Part – II) (Semester – IV) (New CGPA Pattern) Examination, 2016
BOTANY (Paper No. – XV)
Environmental Plant Physiology**

Day and Date : Monday, 4-4-2016

Max. Marks : 70

Time : 2.30 p.m. to 5.00 p.m.

- Instructions:** 1) *Q. 1 is compulsory.*
2) *Solve any two from Q. 2 to Q. 4 and two from Q. 5 to Q. 7.*
3) *All questions carry equal marks.*
4) *Draw neat and labelled diagrams wherever necessary.*

1. Write the correct answer.

14

- 1) Cell membranes of plants resistant to chilling injury contain _____ fatty acids in their lipid bilayer.
a) saturated b) unsaturated c) long chain d) short chain
- 2) Bryophyllum belongs to
a) drought escapers b) water spenders
c) water collectors d) water savers
- 3) SOD catalyzes the reduction of _____ into hydrogen peroxide.
a) molecular oxygen b) singlet oxygen
c) ozone d) superoxide
- 4) Acid rain is caused by higher concentrations of _____ in the atmosphere.
a) NO_x and SO₂ b) NO₂ and O₃ c) SO₂ and O₃ d) CO₂ and SO₂
- 5) _____ is a halophyte.
a) Suaeda b) Sugarbeet c) Datepalm d) Cotton
- 6) In frost injury, ice formation begins at
a) freezing point
b) several degrees below freezing point
c) slightly above the freezing point
d) 10° C

P.T.O.



- 7) Disease occurs in the plants when the pathogen lacks
- a) R genes
 - b) avr genes
 - c) DIR1 genes
 - d) None of these
- 8) Salt glands are present in halophytes showing _____ phenomenon.
- a) Salt avoidance
 - b) Salt evasion
 - c) Salt tolerant
 - d) Salt insensitive
- 9) _____ acts as an osmoticum under water stress condition.
- a) Glycine-betaine
 - b) Proline
 - c) Sorbitol
 - d) All of these
- 10) _____ are considered to be the indicators of heavy metal stress.
- a) Compatible solutes
 - b) Phytochelatins
 - c) LEA proteins
 - d) HSPs
- 11) Elevated CO₂, concentration causes
- a) increase in photosynthesis
 - b) decrease in photorespiration
 - c) increase in WUE
 - d) All of these
- 12) _____ lower the osmotic potential and also water potential of cells without damaging enzyme functions.
- a) amino acids
 - b) organic acids
 - c) sugars
 - d) compatible solutes
- 13) In cotton plant, _____ toxicity develops brown necrotic lesions, leading to crinkle leaf of cotton.
- a) copper
 - b) zinc
 - c) iron
 - d) manganese
- 14) _____ filters out harmful UV radiations.
- a) Ozone
 - b) CFCs
 - c) NO_x
 - d) SO₂



2. Explain the effects of visible and UV radiations on plants. Add a note on the mechanism of UV tolerance. 14
 3. Describe in detail the effects of air pollutants on plant metabolism. 14
 4. Define salinity. Give an account of effect of salt stress on plant metabolism and add a note on salt tolerance in higher plants. 14
 5. Explain in brief
 - a) Mechanism of heavy metal stress tolerance in plants. 7
 - b) Adaptations in plants growing in dry arid region. 7
 6. Write critically about
 - a) Role of jasmonate and salicylic acid. 7
 - b) Plant – plant interaction. 7
 7. Write short notes on (**any three**) : 14
 - a) Osmolytes.
 - b) Effect of elevated CO₂ concentration on plant metabolism.
 - c) Classification of xerophytes.
 - d) Antioxidants.
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M.Sc. – II (Semester – IV) Examination, 2016
BOTANY (CGPA) (New)
Paper – XVI : Crop Physiology

Day and Date : Wednesday, 6-4-2016

Max. Marks : 70

Time : 2.30 p.m. to 5.00 p.m.

- Instructions :**
- i) Attempt total **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) Gibberellins are _____
 - a) Plant hormone that promote stem elongation
 - b) Animal hormone that promote stem elongation
 - c) Promote fruit development
 - d) a) and c)
- 2) Plants marks the season by measuring _____
 - a) Photoperiod
 - b) Gravitropism
 - c) Thigmotropism
 - d) Antioxidants
- 3) Which one of the following is a synthetic auxin ?
 - a) IAA
 - b) NAA
 - c) GA
 - d) None of the above
- 4) Seed dormancy is due to _____
 - a) Ethylene
 - b) Abscisic acid
 - c) IAA
 - d) Starch
- 5) Growth is a _____
 - a) Irreversible increase in size
 - b) Reversible increase in size
 - c) Reversible increase in shape
 - d) Increase in volume



- 6) Manure placed on crop fields will _____
- a) Improve soil structure
 - b) Not loosen soil as much as adding sand
 - c) Compact the soil but provide plant food
 - d) Lower earthworm population
- 7) Which one of the following can be assessed by using the following equation
_____ $A = \text{Economic production} / \text{Biomass production}$.
- a) Panicle emergence rate
 - b) Rate of flowering
 - c) Harvest index
 - d) Leaf production rate
- 8) Which type of irrigation system usually achieves the greatest “field water efficiency” ?
- a) Level basin irrigation
 - b) Furrow irrigation
 - c) Centre pivot automated sprinkler irrigation
 - d) Micro or drop irrigation
- 9) Delay in senescence is caused by the spray of _____
- a) IBA
 - b) GA
 - c) ABA
 - d) Cytokinin
- 10) Which of the following substances can be defined as a chemical substance designed to control weeds ?
- a) Pesticide
 - b) Herbicide
 - c) Insecticide
 - d) Fungicide
- 11) Transport of food material in higher plants takes place through _____
- a) Tracheids
 - b) Transfusion tissue
 - c) Parenchyma
 - d) Sieve elements (Phloem)
- 12) _____ is physiological station in Lucknow.
- a) CIMAP
 - b) CAZRI
 - c) BARC
 - d) UAS
- 13) Which of the following plant help in nitrogen fixation ?
- a) Chickpea
 - b) Mango
 - c) Lemon
 - d) Grape
- 14) Role of Mg in groundnut _____
- a) Chlorophyll binder
 - b) Chlorosis
 - c) Osmosis
 - d) None of above



2. Describe :
 - a) Crop growth analysis and its applications. 7
 - b) Photoperiodism. 7
 3. Give an account of :
 - a) Plant growth regulators in agriculture. 7
 - b) Organic farming and its importance. 7
 4. Describe :
 - a) Physiological basis of yield in cotton. 7
 - b) Source - sink relationship. 7
 5. Explain :
 - a) Mineral nutrition of groundnut. 5
 - b) Nitrogen fixation in chickpea. 4
 - c) Post harvest technology of grapes. 5
 6. Write in brief :
 - a) Crop physiological stations in India. 5
 - b) Vernalization with suitable examples. 4
 - c) Define fertilizers and give its types. 5
 7. Write note on **any three** : 14
 - a) Factors affecting source - sink relations.
 - b) Fruit physiology of grapes.
 - c) Water use efficiency of crops.
 - d) Define weedicides and enlist common weedicides.
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