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M.Sc. I (Semester – I) Examination, 2015

BOTANY (Paper – II) (New)

Biology and Diversity of Algae, Bryophytes and Pteridophytes

Day and Date : Friday, 17-4-2015

Max. Marks : 70

Time : 11.00 a.m. to 2.00 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) The leaves bearing antheridia in the axil are known as
 - a) Perigonial leaves
 - b) Perichaetial leaves
 - c) Paraphysis
 - d) Bracts
- 2) Hygroscopic teeth present at the mouth of the capsule are known as
 - a) Elaters
 - b) Peristome
 - c) Paraphyses
 - d) Elaterophore
- 3) *Azolla* is _____ fern.
 - a) Epiphytic
 - b) Terrestrial
 - c) Aquatic
 - d) Epilithic
- 4) *Lycopodium* is commonly known as
 - a) Quill worth
 - b) Ground pine
 - c) Peat moss
 - d) Club moss
- 5) Sporangia dehisce along a line of
 - a) Stomium
 - b) Ostiole
 - c) Strobilus
 - d) Tapetum
- 6) Wonder plasmis located in
 - a) Carpogonium of *Batrachospermum*
 - b) Young Oogonium of *Vaucheria*
 - c) Oogonium of *Chara*
 - d) None of the above



4. Describe
 - a) Salient features of Sphenopsida 7
 - b) Modern trends in classification of Pteridophytes. 7

 5. Explain
 - a) *Sphagnum* as a peat 5
 - b) Telome concept 4
 - c) Reserved food of algae. 5

 6. Write in brief
 - a) Sporocarp of *Salvinia* 4
 - b) Thallus organization of Acrogynae 5
 - c) Shapes of chloroplast in algae. 5

 7. Write notes on **any three** : 14
 - a) Cultivation of algae
 - b) Strobilus of *Selaginella*
 - c) Sporangium of *Psilotum*
 - d) Peristome.
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M.Sc. – II (Semester – III) Examination, 2015
BOTANY
PAPER – XII : Physiology of Plant Growth and Development

Day and Date : Wednesday, 22-4-2015

Max. Marks : 70

Time : 3.00 p.m. to 6.00 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 alternative and rewrite the sentences :

14

- 1) Polyamines are synthesized from amino acids _____ and _____
a) lysine and arginine b) glycine and serine
c) alanine and aspartate d) other than these
- 2) _____ is a climacteric fruit.
a) banana b) apple c) mango d) all of these
- 3) _____ is a long day plant.
a) Cocklebur
b) Biloxi variety of soyabean
c) Maryland mammoth variety of tobacco
d) Black henbane
- 4) Brassinosteroids were first isolated from the bee-collected pollen grains of
a) *B. campestris* b) *B. napus*
c) *B. oleracea* d) *B. species*



- 5) _____ is an example of PCD.
- a) Formation of necrotic lesions after pathogenic infection
 - b) Development of aerenchyma in aquatic plants
 - c) Disappearance of protoplast in nature vessels and tracheids
 - d) All of these
- 6) Antigibberellins such as CCC find extensive use in
- a) food industry
 - b) breweries
 - c) floriculture industry
 - d) tissue culture
- 7) _____ has become an important research tool for plant molecular biologists in recent years.
- a) *Arabidopsis thaliana*
 - b) *Brassica napus*
 - c) *Solanum tuberosum*
 - d) *Xanthium species*
- 8) In plants, the richest source of phytochrome is
- a) leaves
 - b) stem
 - c) light grown seedling
 - d) etiolated seedling
- 9) _____ a plant growth regulator is also employed as human medicine.
- a) Batassins
 - b) Maleic hydrazide
 - c) Salicylic acid
 - d) Brassinosteroids
- 10) Garner and Allard worked on _____ and discovered photoperiodism.
- a) Maryland mammoth variety of tobacco
 - b) Biloxy variety of soyabean
 - c) Both a and b
 - d) *Hyoscyamus niger*
- 11) Monocarpic senescence is seen in _____
- a) mango
 - b) coconut
 - c) pomegranate
 - d) bamboo
- 12) _____ is not a secondary messenger.
- a) Ca^{++}
 - b) c AMP
 - c) c GMP
 - d) ABA



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M.Sc. II (Semester – IV) Examination, 2015
BOTANY (Paper – XIII)
Phytogeography and Conservation Biology

Day and Date : Thursday, 16-4-2015
Time : 3.00 p.m. to 6.00 p.m.

Max. Marks : 70

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

1. Write the correct answer from given alternatives. **14**
- 1) The term _____ means 's particular taxon has very restricted distribution'.
a) Endemic
b) Low risk
c) Threatened
d) Critically Endangered
 - 2) In _____ technique the plant material preserved in liquid nitrogen.
a) Ediacaran
b) Skeletonizing
c) Cryopreservation
d) Biotechnology
 - 3) The term age and area hypothesis was coined by _____.
a) Alfred Wagner
b) John Willis
c) Charles Smith
d) William Roxburgh
 - 4) Biodiversity is conserves outside the natural habitat means _____ conservation
a) In-situ
b) In-vivo
c) Ex-vivo
d) Ex-situ
 - 5) Wildlife protection act was established on _____.
a) 1972
b) 2010
c) 1980
d) 2002



- 6) National forest policy aims at bringing _____ of geographical area under forest cover
a) 15% b) 33% c) 75% d) 90%
- 7) Padua Botanical garden is located at _____
a) Washington b) Netherlands c) England d) Italy
- 8) The concept _____ is being evolved for sustainable agriculture.
a) Agro-forestry b) Polyhouse
c) Community seed bank d) Afforestation
- 9) _____ is the endemic tree genera for India.
a) Acacia b) Hardwickia c) Azadirachta d) Magnolia
- 10) _____ is chiefly a matter of quality while _____ is matter of quantity.
a) Flora, Vegetation b) Vegetation, Flora
c) Flora, Fauna d) Fauna, Flora
- 11) One of the most important biotic region of world is _____
a) The tundra b) Northern coniferous forest
c) Temperate grassland d) Temperate deciduous forests
- 12) The Biological Diversity Act is established in _____
a) 2002 b) 2004 c) 2008 d) 1996
- 13) For the successful polyhouse _____ is one of the most important component
a) CO₂ enrichment b) Heating c) Mulching d) Ventilation
- 14) 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
2. Write an essay on vegetation on Western Ghats. 14
3. What is ex-situ conservation ? Describe various methods of ex-situ conservation. 14



- | | |
|--|----|
| 4. Discuss on Phytogeographical zones of India. | 14 |
| 5. Describe in briefly. | |
| a) Wildlife Protection Act. | 7 |
| b) Role of NGO's in Conservation. | 7 |
| 6. Write on : | |
| a) RET Plants | 7 |
| b) Role of Bio-technology in conservation. | 7 |
| 7. Write short notes on any three of the following. | 14 |
| a) Vicariance | |
| b) Mangroves | |
| c) Sacred Groves | |
| d) Centres of speciation. | |
-



- vi) The concept of cellular totipotency was given by
- a) Carlson et.al.
 - b) Steward
 - c) Barski et. al.
 - d) Vasil and Hilderbrandt
- vii) Development of shoot and root in tissue culture is determined by
- a) Cytokinin to auxin ratio
 - b) Enzymes
 - c) Plant nutrients
 - d) Temperature
- viii) 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
- ix) Which one of the following is cytokinin ?
- a) Indole-3-acetic acid
 - b) Thidiazuron
 - c) Dicamba
 - d) Brassinosteroids
- x) Explant is required to be disinfected before placing in culture. This is done by
- a) Sodium hypochloride
 - b) Mercuric chloride
 - c) Calcium hypochloride
 - d) All of these
- xi) Protoplast fusion is induced by which of the following treatments ?
- a) High voltage electric pulse
 - b) High pH and High Ca^{2+} concentration
 - c) Polyethylene glycol (PEG)
 - d) All of these
- xii) Cryopreservation is based on which of the following ?
- a) Liquid CO_2
 - b) Liquid helium
 - c) Liquid nitrogen
 - d) All of these
- xiii) Which of the following is thermo stable ?
- a) Zeatin
 - b) Pectinase
 - c) ABA
 - d) All of these
- xiv) Application of embryo culture is
- a) Clonal propagation
 - b) Production of alkaloids
 - c) Overcoming hybridization barrier
 - d) Haploid production



2. Describe :
 - a) What is greenhouse ? Describe different types of greenhouses. 7
 - b) Write an essay on embryo culture. 7
 3. Give an account of
 - a) Detailed methodology for synthetic seed production. 7
 - b) Explain in detail the steps involved in the production of homozygous lines from anther culture. 7
 4. Describe the following :
 - a) Factors affecting anther culture. 7
 - b) Construction of green house. 7
 5. Explain :
 - a) Different growth media used in hydroponics. 5
 - b) Systems for production of secondary metabolites. 5
 - c) Laboratory design in PTC. 4
 6. Write in brief
 - a) Different types of culture and their applications. 5
 - b) Elicitors used in secondary metabolite production. 5
 - c) Sequential steps for Somatic embryogenesis. 4
 7. Write notes on **any three** : 14
 - a) Applications of synthetic seeds.
 - b) Applications of hydroponics.
 - c) Fumigation in green house.
 - d) Macronutrients.
-



14) As a result of Green House effect, there will be _____

- a) increase in atm. humidity
- b) increase in temperature
- c) decrease in CO₂ concentration
- d) increase in SO₂ concentration

- II. Explain biotic stress tolerance mechanism in plants with reference to HR and SAR. 14
 - III. Give an account of effect of air pollutants on plant metabolism studied by you. 14
 - IV. Write an essay on Allelopathy and Plants. 14
 - V. Describe in brief :
 - a) Effects of water stress on plant metabolism. 7
 - b) Structural adaptations in xerophytes in response to water stress. 7
 - VI. Give an account of :
 - a) Reactive oxygen species in plants and their origin. 7
 - b) Antioxidants in plants and their role. 7
 - VII. Write short notes on **any three** : 14
 - a) Effects of UV radiations on plants
 - b) Types of salinity and reclamation of saline soils
 - c) Effects of flood and tolerance mechanism in plants
 - d) Impact of elevated CO₂ concentration on plants.
-



- 6) Weed is nothing but
- a) Plant at wrong places b) Unwanted plants
c) Both (a) and (b) d) None of these
- 7) Optimum growth occurs in
- a) Blue light b) Red light c) White light d) Green light
- 8) The hormone which has positive effect on apical dominance
- a) Auxin b) Cytokinin c) GA d) All of these
- 9) The rate of dry matter production or increase in dry weight of plant per unit leaf area per unit time is known as
- a) LAR b) NAR c) Harvest index d) None of these
- 10) Mainly BGA is used in the field of
- a) Jowar b) Bajara c) Rice d) Maize
- 11) Optimum temperature required for plant growth is
- a) 15 to 30°C b) 10 to 15°C c) 35 to 40°C d) 20 to 30°C
- 12) Which of the following is not DNP ?
- a) Radish b) Cotton c) Cucumber d) Potato
- 13) Most frequently occurring organic acid in fruit cells are
- a) Tartaric Acid b) Citric Acid c) Malic Acid d) Both (b) and (c)
- 14) Hormone used to reduce stomatal aperture size is
- a) ABA b) Ethylene c) GA d) Auxin
2. a) Define the term weedicide and explain about common weedicides and their mode of action. 7
- b) Give an account of physiological basis of yield in cotton. 7
3. a) What is manure ? Discuss various types of manures and its role in fertility of soil. 7
- b) What is Photoperiodism ? Give an account of classification of plants based on Photoperiodism. 7



4. a) What is translocation of solute ? Explain source and sink concept of translocation of solute and add note on factors affecting on it. **7**
- b) Write the contribution of research stations in Indian agriculture. **7**
5. Describe briefly :
- a) Common weedicides and their mode of action. **5**
- b) Nitrogen fixation in chick pea. **5**
- c) Formulate of growth measurement and its analysis. **4**
6. Write on :
- a) Vernalization. **5**
- b) Brief idea of physiological basis of yield of cotton. **5**
- c) Antitranspirants. **4**
7. Write short notes on **any three** of the following : **14**
- a) BARC, Bombay
- b) Role of florigen
- c) Rhizobium as a fertilizer
- d) Physiological basis of yield of wheat.
-



- 6) For isolation of enzyme, buffers are used because they prevent change in _
- a) Enzyme concentration b) Substrate concentration
c) Enzyme structure d) pH
- 7) The concentration of H^+ in pure water at $25^\circ C$ is
- a) $1 \times 10^{-14}M$ b) $1 \times 10^{-7}M$
c) $7 \times 10^{-7}M$ d) $7 \times 10^{-14}M$
- 8) _____ permits to understand variation due to different factors which affect the values in the given data.
- a) Standard deviation b) Mean deviation
c) ANOVA d) Coefficient of variation
- 9) The standard units of radioactivity measurement is/are
- a) becquerel b) millicurie
c) microcurie d) both b) and c)
- 10) The solubilizers used in gel electrophoresis are
- a) SDS b) CTAB
c) B-mercaptoethanol d) All of these
- 11) H. Svensson in Sweden developed a technique _____ for the better resolution of proteins.
- a) electrophoresis b) gel electrophoresis
c) isoelectric focussing d) fast protein liquid chromatography
- 12) For isopycnic centrifugation, _____ is used.
- a) sucrose b) cesium chloride
c) sephadex d) starch
- 13) Liquid scintillation counter is extremely useful for quantifying
- a) alpha emitters b) gamma emitters
c) soft beta emitters d) all of these
- 14) 100 ppm GA solution contains _____ mg in 100 ml.
- a) 1000 b) 100
c) 10 d) 1



2. a) Give the information about computer software's used in Biology. 7
b) Explain the use of radioisotopes in Botany with suitable examples. 7
 3. a) Discuss the principles of any five types of spectrophotometry studied by you. 7
b) Enlist the applications of UV-VIS and fluorescence spectrophotometry. 7
 4. a) Explain the technique of column chromatography in brief. 7
b) Sketch a diagram of fluorescence microscope showing its construction. 7
 5. a) Give an account of permanent slide preparation in Botany. 5
b) Describe various stains used in cytological preparations. 5
c) Which are the important herbaria in India ? 4
 6. a) Define ultracentrifugation. Explain how it has been useful in molecular biology. 5
b) Describe any one radioactivity counting system. 5
c) Give an account of stationary and moving phases in any two types of chromatography. 4
 7. Write notes on **any three** : 14
 - a) Banding technique
 - b) Standard units of expression
 - c) Radioactive emissions
 - d) Chi-square test.
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M.Sc. – I (Semester – II) Examination, 2015
BOTANY (New)
(Paper No. – V)
Biology and Diversity of Gymnosperms and Palaeobotany

Day and Date : Thursday, 16-4-2015
Time : 11.00 a.m. to 2.00 p.m.

Total 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) The gymnosperm having fan shaped leaf is
a) *Ephedra* b) *Ginkgo* c) *Zamia* d) *Cupressus*
- 2) Tertiary spiral thickening in the tracheids is observed in
a) *Ephedra* b) *Taxus* c) *Cycas* d) *Cupressus*
- 3) The stem and seed of _____ yield a starch known as 'sago'
a) *Ginkgo* b) *Ephedra* c) *Cycas* d) *Zamia*
- 4) Exactly circular bordered pits are observed in
a) *Araucaria* b) *Cupressus* c) *Ephedra* d) *Podocarpus*
- 5) Long form of R.L.S. is
a) Radial Longitudinal Section b) Reverse Longitudinal Section
c) Regional Lengthwise Section d) Radius Length Section



2. a) Reproductive organs of <i>Ephedra</i> .	7
b) Economic importance of Conifers.	7
3. a) Salient features of Taxales.	7
b) Write briefly about the Paleaobotanical technique.	7
4. a) Shoot dimorphism of <i>Ginkgo</i> .	7
b) Morphology and anatomy of <i>Rhynia major</i> .	7
5. Describe :	
a) Male cone of <i>Zamia</i> .	5
b) Female cone of <i>Araucaria</i> .	5
c) Microsporophyll of <i>Ginkgo</i> .	4
6. Explain :	
a) Stellar patterns in the genus <i>Medullosa</i> .	5
b) Give important features of Psilophytales.	5
c) <i>Glossopteris</i> flora.	4
7. Write notes on any three :	14
a) Ephidrine	
b) Pycnoxylic wood	
c) <i>Calamostyichys</i>	
d) Megasporophyll of <i>Zamia</i> .	



SECTION – II

- | | |
|---|---|
| 2. a) Give an account of evolutionary trends in inflorescence. | 7 |
| b) Write in brief principles of ICBN. | 7 |
| 3. a) What is typification ? Describe various nomenclatural types. | 7 |
| b) Discuss evolutionary trends in 'Habitat and Growth habit'. | 7 |
| 4. a) Merits of Cronquist's system of classification. | 7 |
| b) Discuss salient features and morphological diversity of family Sapotaceae. | 7 |

SECTION – III

- | | |
|--|----|
| 5. a) Evolutionary trends in stomatal apparatus. | 5 |
| b) Omega taxonomy. | 5 |
| c) Citations of Author's name. | 4 |
| 6. a) Effective and valid publication. | 5 |
| b) Evolutionary trends in seed. | 5 |
| c) Systematic position of Magnoliaceae. | 4 |
| 7. Write notes on any three : | 14 |
| a) Salient features of Polygoniaceae. | |
| b) Salient features of Tiliaceae. | |
| c) Salient features of Myrtaceae. | |
| d) Functions of taxonomy. | |
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**M.Sc. – I (Semester – II) Examination, 2015
BOTANY (New) (Paper – VII)
Cell and Molecular Biology of Plants**

Day and Date: Tuesday, 21-4-2015
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) Membrane phospholipids include _____
 - a) Cholesterol
 - b) Plasmalogens
 - c) Sphingolipids
 - d) Triglycerides
- 2) In agarose gel electrophoresis DNA moves from _____ electrode.
 - a) – ve to + ve
 - b) – ve to – ve
 - c) + ve to – ve
 - d) + ve to higher + ve
- 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) Maintenance of cell turgor is an important function of _____
 - a) Cell wall
 - b) Vacuole
 - c) ER
 - d) Nucleus



5) Each type of the cytoskeletal filament is constructed from smaller _____ subunits.

- a) Nucleic acid b) Protein c) Lipoprotein d) Sugar

6) Terminology of introns and exons is given by _____.

- a) Chaw et al b) Walter Gilbert
c) Bergetet al d) Sharp and Roberts

7) Extremely large DNA molecules are resolved by _____.

- a) PAGE b) Agarose gel electrophoresis
c) PFGE d) None of the above

b) Fill in blanks.

7

1) _____ are small granular or filamentous bodies which are called the powerhouse of the cell.

2) Genetic code was deciphered through the experiments of scientist _____.

3) _____ facilitates rapid transport of water across the plasma membrane.

4) Transport of metabolites across the membrane along the concentration gradient and without the use of a carrier molecule is called _____.

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

6) The phenomenon of programmed cell death is called as _____.

7) _____ is an initiation codon.

II. Write in short about :

a) Ultra structure of plasma membrane.

7

b) Plasmodesmata.

7



III. Discuss in short about :

- a) Ultra structure of chloroplast. 7
- b) Biogenesis of mitochondria. 7

IV. Explain briefly :

- a) Structure and function of tonoplast. 7
- b) Satellite DNA. 7

V. Comment upon :

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

VI. Comment upon :

- a) FISH 5
- b) Cyclins 5
- c) Cell plate formation and cytokinesis. 4

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

- a) Confocal microscopy.
 - b) Enzyme regulation.
 - c) GISH
 - d) Kinetics.
-



5) Each type of the cytoskeletal filament is constructed from smaller _____ subunits.

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- a) PAGE b) Agarose gel electrophoresis
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b) Fill in blanks.

7

1) _____ are small granular or filamentous bodies which are called the powerhouse of the cell.

2) Genetic code was deciphered through the experiments of scientist _____.

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7) _____ is an initiation codon.

II. Write in short about :

a) Ultra structure of plasma membrane.

7

b) Plasmodesmata.

7



III. Discuss in short about :

- a) Ultra structure of chloroplast. 7
- b) Biogenesis of mitochondria. 7

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- b) Satellite DNA. 7

V. Comment upon :

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

VI. Comment upon :

- a) FISH 5
- b) Cyclins 5
- c) Cell plate formation and cytokinesis. 4

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

- a) Confocal microscopy.
 - b) Enzyme regulation.
 - c) GISH
 - d) Kinetics.
-



- 4. a) Describe the mechanism of infection by pathogen. 7
 - b) Explain the morphological defense mechanism of host plant against pathogens. 7
 - 5. a) Write the symptoms and control measures of little leaf of Brinjal. 5
 - b) Add a note on symptoms and control of rust disease. 5
 - c) Control of seed borne pathogens. 4
 - 6. a) Write the symptoms, cause and control measures of downy mildew of grape. 5
 - b) Add a note on the host range and symptoms of smut diseases. 5
 - c) BMV-disease-symptoms and control. 4
 - 7. Write short notes on **any three** of the followings. 14
 - a) Chemical control of plant disease.
 - b) Plant disease forecasting
 - c) Powdery mildew disease-symptoms and control measures.
 - d) Control measures of root parasites.
-

