

2021

BOTANY

(Honours)

Paper-CC-BOT-XI

(*Reproductive Biology of angiosperm*)

Full Marks : 60

Time : 3 hours

Answer all questions.

The figures in the right-hand margin indicate marks.

PART—I

1. Answer all the questions : 1 × 8

(a) The process of formation of male gametes
is _____.

(b) Study of pollen is known as _____.

(2)

- (c) The opening of integumentary sheath of the ovule is called as _____.
- (d) The third integument present in same ovule is called _____.
- (e) Pollination by bird is called as _____.
- (f) When anther mature before stigma, the condition is called _____.
- (g) The ploidy of endosperm is _____.
- (h) Development of female gamete into new individual without fertilization is called _____.

PART—II

2. Answer any *eight* questions within 2 to 3 sentences : 1.5×8

- (a) Tapetum
- (b) Pollinia

(3)

- (c) Hypostase
- (d) Embryosac
- (e) Autogamy
- (f) Pollenkit
- (g) Double fertilization
- (h) Chalazogamy
- (i) Emasculation
- (j) Endothelium

PART—III

3. Answer any *eight* questions within 75 words : 8×2

- (a) MGU
- (b) Massulae
- (c) Structure and function of anther

(4)

- (d) Structure of Ovule
- (e) Megasporogenesis
- (f) Self-pollination
- (g) Development of Endosperm
- (h) Two differences between Dicot and Monocot embryo
- (i) Apomixis
- (j) NPC system

PART—IV

Answer the following questions within

500 words :

4. Describe the microsporogenesis process in detail. 6

Or

Describe pollen viability, storage and germination.

(5)

5. Describe megagametogenesis in detail. 6

Or

Describe the developmental pattern of bi and tetrasporic embryo sac.

6. What is pollination ? Describe the types and significance. 6

Or

What is self incompatibility ? Describe methods to overcome self incompatibility.

7. Describe the structure and dispersal mechanism of seed. 6

Or

What is polyembryony ? Describe the causes and applications of polyembryony.

2021

BOTANY

(Honours)

Paper-CC-BOT-XII

(Plant Physiology)

Full Marks : 60

Time : 3 hours

Answer all questions.

The figures in the right-hand margin indicate marks.

PART—I

1. Answer all the questions : 1 × 8

(a) The nonliving pathway of water is called _____.

(b) The water potential of pure water is _____.

(c) Magnesium is a _____ element.

(Turn Over)

(2)

- (d) Soil less culture is known as ———.
- (e) The hormone involved in stomatal movement is ———.
- (f) The hormone extracted from the fungus Gibberella is ———.
- (g) The pigment responsible for photo-periodism ———.
- (h) The hormone responsible for flowering is ———.

PART—II

2. Answer any *eight* questions within 2 to 3 sentences : 1.5×8

- (a) Apoplast ✓
- (b) Aquaporins ✓
- (c) Plasmolysis ✓
- (d) Deficiency symptoms of Nitrogen

(3)

- (e) Write two criteria for essentiality
- (f) Structure of cytokinins
- (g) Jasmonic acid
- (h) Senescence ✓
- (i) LER ✓
- (j) Hydathodes ✓

PART—III

3. Answer *eight* questions within 75 words : 2×8

- (a) Transmembrane pathway
- (b) Cohesion-tension theory
- (c) Water potential
- (d) Chelating agents
- (e) Carrier system

(4)

- (f) Brassinosteroids
- (g) Bioassay of ABA (Abscissic Acid)
- (h) Seed dormancy
- (i) Vernalization
- (j) HIR

PART—IV

Write the answers within 500 words :

4. What is transpiration ? Describe the mechanism of stomatal movement. 6

Or

Describe translocation in the phloem explaining pressure-flow model.

5. What is mineral nutrition ? Describe the deficiency symptoms of any three macro elements. 6

(5)

Or

Describe the active absorption of ions.

6. Describe the bioassay and physiological role of Auxin. 6

Or

Describe the discovery and physiological role of Gibberellins.

7. What is photoperiodism ? Describe the role of Florigen in flowering. 6

Or

Describe the role of phytochrome in photomorphogenesis.

2021

BOTANY

(DSE)

Paper-DSE-BOT-1

(*Analytical Techniques in Plant Science*)

Full Marks : 60

Time : 3 hours

Answer all questions.

The figures in the right-hand margin indicate marks.

PART—I

1. Answer all the questions : 1 × 8

(a) The resolving power of unaided eye is _____.

(b) The technique used to count cells in heterogenous fluid mixture is _____.

(2)

- (c) ——— process is used to fractionate subcellular organelles.
- (d) The isotopes having unstable nucleus and emit radiations are called ———.
- (e) The sedimentation coefficient is expressed in ——— unit.
- (f) Full form of AGE.
- (g) ——— represent the whole population.
- (h) Mean deviation is the measure of ———.

PART—II

2. Answer any *eight* questions within 2 to 3 sentences : 1.5×8

- (a) Microscopy
- (b) Magnifying power of microscope
- (c) Ultracentrifuge
- (d) Homogenization

(3)

- (e) Optical density
- (f) Retardation factor
- (g) Mobile phase of chromatography
- (h) Agarose
- (i) Types of Data
- (j) Range

PART—III

3. Answer any *eight* questions within 75 words : 2×8

- (a) Principles of microscopy
- (b) Shadow casting
- (c) Ultracentrifugation
- (d) Auto-radiography
- (e) Paper-chromatography
- (f) X-ray diffraction

(4)

(g) Correlation

(h) Test of significance

(i) Principles of chromatography

(j) Freeze etching

PART—IV

Answer the questions within 500 words : 6×4

4. Describe the principle and applications of fluorescence microscope.

Or

Give an account of Transmission electron microscope.

5. Give an account of density gradient centrifugation and its application.

Or

(5)

Describe the principles and applications of spectrophotometry.

6. What is chromatography ? Describe any two types of chromatography.

Or

What is electrophoresis ? Describe any two types of electrophoresis.

7. What is dispersion ? Describe standard deviation and variance.

Or

What is chi-square test ? Describe the use of chi-square test for goodness of fit.

2021

BOTANY

(Discipline Specific Elective)

Paper-DSE-BOT-II

(Natural Resource Management)

Full Marks : 60

Time : 3 hours

Answer all questions.

The figures in the right-hand margin indicate marks.

PART—I

1. Answer all the questions : 1 × 8

**(a) Water is which type of natural resource.
(renewable/nonrenewable)**

(b) _____ is the main source of Energy.

(c) Write the full form of CBD.

(Turn Over)

(2)

(d)—— is the major forest product.

(e) Write the full form of GIS.

(f) The type of energy obtained from hot spring.

(g)—— is the disposal method in which solid waste subjected to combustion.

(h) The process used to convert domestic waste into recovered fuel.

PART—II

2. Answer any *eight* questions within 2 to 3 sentences : 1.5×8

✓ (a) Define natural resource.

✓ (b) Write any two fresh water bodies.

✓ (c) Define IPR.

(d) What is National Biodiversity plan ?

(3)

✓ (e) Write two minor forest products.

(f) Carbon footprint

✓ (g) Tidal Energy

(h) Natural resource accounting

✓ (i) Ground water

✓ (j) Siviculture

PART—III

3. Answer any *eight* questions within 75 words : 2×8

✓ (a) Types of Biodiversity

✓ (b) Water harvesting technology

(c) Bioprospecting

(d) Write two forest cover in reference to India.

✓ (e) Bioenergy resources

(4)

- (f) Explain Resource appraisal.
- ✓ (g) Types of Natural resources with examples
- (h) Landfill
- ✓ (i) Horticultural land utilization
- ✓ (j) Causes of soil degradation

PART—IV

Answer the questions within 500 words : 6×4

4. Describe the concept and approaches of sustainable utilization.

Or

Give a brief account of rain water storage and utilization techniques.

5. Describe the threat and management strategies of Biodiversity.

(5)

Or

Describe the causes of depletion of forest and its management strategies.

6. What is Energy ? Describe the various sources of Energy.

Or

Give an account of Ecological footprint.

7. Describe briefly on various waste management systems.

Or

Describe the national efforts for natural resource management.

2022

BOTANY

(*Reproductive Biology of Angiosperms*)

[Honours]

Paper — CC-BOT-XI

Full Marks : 60

Time : 3 hours

Answer all questions

The figures in the right-hand margin indicate marks

PART — I

1. Answer *all* the questions : 1 × 8

(a) The preservation of pollen grain during fossilization is due to presence of _____ in exine.

(b) _____ cell in the pollen grain form male gametes.

(Turn Over)

(2)

- (c) The ovule in which funicle forms a circle around the body of the ovule is called _____.
- (d) The basal stalk of ovule by which it is attached to placenta is called _____.
- (e) The bisexual flower where stamen and stigma matures at different times is called _____.
- (f) When pollen tube enter into the ovule through micropyle the condition is called _____.
- (g) The residual persistent nucellus tissue present in the seed is known as _____.
- (h) The phenomenon of substitution of sexual process by asexual method is known as _____.

PART - II

2. Answer any *eight* questions within *two to three* sentences :

$1\frac{1}{2} \times 8$

(a) *Pseudomonas*

(3)

- (b) Palynology
- (c) Malegametophyte
- (d) Caruncle
- (e) Anatropous ovule
- (f) Nucellus
- (g) Cleistogamy
- (h) Mixed pollination
- (i) Liquid Endosperm
- (j) Suspensor.

PART - III

3. Answer any *eight* questions within 75 words : 2×8

- (a) Pollinia
- (b) Microsporogenesis
- (c) Pollen germination

(4)

(d) Megagametogenesis

(e) Embryosac

(f) Ornithophilly

(g) Geitonogamy

(h) Pollen wall proteins

(i) Structure of seed

(j) Polyembryomy.

PART - IV

Answer the following questions within

500 words :

6 × 4

4. Describe microgametogenesis in detail.

6

Or

Describe the structure and function of
anther wall.

6

5. Describe the structure and types of ovule found
in plants.

6

(5)

Or

Describe the types of embryosac and the
ultrastructure of polygonum type of embryosac.

6

6. Describe the process of double fertilization in
plants.

6

Or

Write notes on :

3 × 2

(i) Intra ovarian pollination

(ii) Bud pollination.

7. What is Embryogeny ? Describe the development
of dicot embryo.

6

Or

Describe the types and significance of
apomixis.

6

2022

BOTANY

(*Plant Physiology*)

[Honours]

Paper — CC-BOT-XII

Full Marks : 60

Time : 3 hours

Answer all questions

The figures in the right-hand margin indicate marks

PART — I

1. Answer all questions :

1 × 8

- (a) The cohesion tension theory was proposed by _____.
- (b) The integral membrane protein form water specific pores in the membrane called _____.

(Turn Over)

(2)

- (c) The agents used to remove metals from the body is called _____.
- (d) The transport of more than one molecule through plasmamembrane at the same time and same direction is called _____.
- (e) _____ hormone is able to overcome genetic dwarfism.
- (f) Ethylene is a _____ hormone.
- (g) The response of light with regard to flowering is called _____.
- (h) Low temperature treatment to seeds to break dormancy is called _____.

PART - II

2. Answer any *eight* questions within *two to three* sentences : $1\frac{1}{2} \times 8$
- (a) Transmembrane system

(3)

- (b) Imbibition
- (c) Hydathodes
- (d) Antitranspirants
- (e) Micronutrients
- (f) Chelating agents
- (g) Apical dominance
- (h) Chlorosis
- (i) Long day plants
- (j) Structure of phytochrome.

PART - III

3. Write *eight* questions within 75 words : 2×8
- (a) Components of water potential
 - (b) Symplast
 - (c) Transpiration

(4)

- (d) Essential elements
- (e) Facilitated diffusion
- (f) Co-transport
- (g) Natural and synthetic auxins
- (h) Jasmonic acid
- (i) Devernalization
- (j) Photomorphogenesis.

PART - IV

Answer all the questions within 500 words : 6 × 4

4. What is ascent of sap ? Describe cohesion-tension theory.

Or

Give an account of phloem loading and unloading.

(5)

5. Describe the methods of study and use of nutrient solution.

Or

Describe Proton ATPase pump in plants.

6. Describe the discovery and physiological effects of cytokinin.

Or

Describe the bioassay and physiological effects of ethylene.

7. Give an account of vernalization.

Or

What is senescence ? Describe the types and causes of senescence.

2022

BOTANY

(Analytical Techniques in Plant Science)

Paper — DSE-BOT-I

Full Marks : 60

Time : 3 hours

Answer all questions

The figures in the right-hand margin indicate marks

PART — I

1. Answer *all* the questions : 1 × 8

(a) The fluorescent molecules are called _____.

(b) _____ is used as electron source in Electron microscope.

(c) Sedimentation is a process of settlement of particles is due to _____.

(Turn Over)

- (d) Mobile phase of column chromatography is called as _____.
- (e) The bioanalytical technique used to visualize the distribution of radioactive labelled substance in biological sample is called _____.
- (f) The technique that enables separation and analysis of charged molecule in an electric field is called _____.
- (g) The process of taking samples from population is called _____.
- (h) The quantitative assessment that measures the strength of the relationship of variables is called _____.

PART - II

2. Answer any *eight* questions out of the following within 2 to 3 sentences : $1\frac{1}{2} \times 8$

- (a) Resolution power of microscopy.
- (b) Cryofixation.

- (c) Svedberg unit.
- (d) Pulse-Chase experiment.
- (e) What is rotor in Centrifugation ?
- (f) Define stationary phase.
- (g) What is mass spectrum ?
- (h) Role of SDS in SDS-PAGE.
- (i) Define variables in Biostatistics.
- (j) Define Range. 4×5

PART - III

3. Answer any *eight* questions of the following within 75 words : 2×8

- (a) Applications of fluorescent microscope.
- (b) Radio isotopes.
- (c) What is centrifugation ?

(4)

- ~~(a)~~ Define TLC.
- ~~(e)~~ What is negative staining.
- ~~(f)~~ X-ray diffraction.
- ~~(g)~~ Applications of PAGE.
- ~~(h)~~ Spectrophotometry.
- ~~(i)~~ Standard deviation.
- ~~(j)~~ Null hypothesis.

PART – IV

Answer the questions within 500 words : 6×4

4. Describe the principles of microscopy.

Or

Give an account of scanning electron microscope.

5. Give an account of differential centrifugation and its application.

V-DSE – Bot-I

(Continued)

(5)

Or
Describe the role of radioisotopes in biological research.

6. Describe the technique, application and advantages of HPLC.

Or

Describe Agarose gel electrophoresis (AGE).

7. What is data in Biostatistics ? Describe the methods of representation of data.

Or

What is central tendency ? Describe any two methods of measures of central tendency.

V-DSE – Bot-I

NA-1,200

2022

BOTANY

(*Natural Resource Management*)

Paper — DSE-BOT-II

Full Marks : 60

Time : 3 hours

Answer all questions

The figures in the right-hand margin indicate marks

PART — I

1. Answer *all* the questions :

1 × 8

(a) The science of growing fruits, vegetables herbs, and ornamental plants is called _____.

(b) Fossil fuel is a _____ resource.

(c) The diversity found within the community is called _____.

(*on Over*)

(2)

- (d) _____ type of forest occupies the highest area in India.
- (e) The radioactive material _____ is the common fission fuel.
- (f) _____ is the energy generated from biomass.
- (g) The site for disposal of waste material by burial is called _____.
- (h) The machine used for exploitation of wave power is called _____.

PART – II

2. Answer any *eight* questions within *two to three* sentences : $1\frac{1}{2} \times 8$

(a) Abiotic resources

(b) What is Siviculture ?

(c) Groundwater

(3)

(a) What is biodiversity ?

(e) Define forest cover.

(f) What is CBD ?

(g) Renewable source of energy.

(h) Define EIA.

(i) Pyrolysis

(j) What is waste management ?

PART – III

3. Answer any *eight* questions within 75 words : 2×8

(a) Define GIS.

(b) What is sustainability ?

(c) Rainwater storage.

(d) Wind Energy.

(e) Major products of forest.

(4)

(f) Forest depletion.

(g) Advantages of Solar Energy.

(h) Ecological Footprint.

(i) Waste handling process.

(j) Define Incarnation.

PART – IV

Answer the questions within 500 words : 6 × 4

4. Define natural resources. Narrate various types of Natural Resources.

Or

What is soil degradation ? Describe methods of soil degradation management.

5. Narrate various aspects of Bioprospecting.

Or

Describe the types and conservation of biodiversity.

(5)

6. Give an account of contemporary practices to resource management.

Or

What is carbon footprint ? How the carbon footprint can be reduced ?

7. Describe briefly on natural resource accounting.

Or

Describe International effort on natural resource management.

2023

BOTANY

Paper- CC -XI

Full Marks : 60

Time : 3 hours

Answer from *all* the Parts as directed.

*The figures in the right-hand margin
indicate marks.*

*Candidates are required to give their answers
in their own words as far as practicable.*

PART—I

1. Answer *all* the questions.

1 × 8

**(a) Pollinia are generally found in _____
family.**

(Turn Over)

(2)

- (b) The sticky nature of the pollen grain is due to the presence of _____.
- (c) Integumentary tapetum is alternatively called _____.
- (d) _____ helps in the movement of pollen tube towards the embryo sac.
- (e) Production of flowers which never opens is known as _____.
- (f) The removal of another from bisexual flower to prevent self pollination is called _____.
- (g) The structure of seed which helps to float it in air by mechanism called _____.
- (h) The embryo of monocotyledons has a terminal cotyledon known as _____.

(Continued)

(3)

PART—II

2. Answer any *eight* questions within 2 to 3 sentences. 1.5 × 8

- (a) Massulae
- (b) Tapetum
- (c) Sporopollenin
- (d) Obturator
- (e) Campylotropous ovule
- (f) Hydrophily
- (g) Mesogamy
- (h) Endospermic seed
- (i) Zoochory
- (j) Adventive Embryo

(4)

PART—III

3. Answer any *eight* questions within 75 words. 2×8

(a) MGU

(b) Polyads

(c) Microgametogenesis

(d) Hypostase

(e) Circinotropous ovule

(f) Double fertilization

(g) Bud pollination

(h) Apomixis

(i) Endosperm

(j) Embryogeny

(5)

PART—IV

Answer the following questions within 500 words. 6×4

4. Describe the process of microsporo-genesis.

Or

What is palynology? Describe the scope of palynology.

5. Describe the process of mega-gameto-genesis.

Or

Describe the process of development of mono and bi sporic embryosac.

6. What is pollination? Describe the types of pollination found in plants.

Or

2023

BOTANY

Paper- CC -XII

(*Plant Physiology*)

Full Marks : 60

Time : 3 hours

Answer from all the Parts as directed.

***The figures in the right-hand margin
indicate marks.***

***Candidates are required to give their answers
in their own words as far as practicable.***

PART—I

1. Answer *all* the questions.

1 × 8

**(a) The most accepted theory of stomatal
opening and closing is _____.**

(Turn Over)

(2)

(b) The water potential of pure water is _____.

(c) Mn is a _____ nutrient.

(d) Facilitated diffusion is the process of _____ transport of molecules.

(e) Auxin was discovered by _____.

(f) _____ is a climacteric fruit.

(g) _____ is the light absorbing component of phytochrome.

(h) The process of removal of hard seed coat of seed is called _____.

PART—II

2. Answer any *eight* questions within 2 to 3 sentences. 1.5 × 8

(a) Apoplast

(b) Guttation

(3)

(c) Solute potential

(d) Macronutrients

(e) Parthenocarpy

(f) Structure of cytokinin

(g) Growth retarding hormones

(h) Vernalin

(i) HIR

(j) Uniport

PART—III

3. Answer any *eight* questions within 75 words. 2 × 8

(a) Plasmolysis

(b) Aquaporine

(c) Structure of stomata

(4)

(d) Pressure flow model

(e) Chelating agents

(f) Antiport

(g) Avena coleoptile test

(h) Senescence

(i) LER

(j) Seed dormancy

PART—IV

Answer the following questions within 500 words. 6×4

4. Describe the process of water absorption by roots.

Or

Describe the mechanism of stomatal opening and closing.

(5)

5. Describe the criteria of essentiality and the role of essential elements.

Or

Describe the passive absorption of ions across the membrane.

6. Describe the discovery, structure and bioassay of Gibberellins.

Or

Describe Brassinosteroids as growth hormone.

7. What is photoperiodism ? Describe the role of photoperiodism in flowering.

Or

Describe the structure and role of phytochrome in photomorphogenesis.

2023

BOTANY

Paper- DSE-I

Full Marks : 60

Time : 3 hours

Answer from **all** the Parts as directed.

*The figures in the right-hand margin
indicate marks.*

*Candidates are required to give their answers
in their own words as far as practicable.*

PART—I

1. Answer *all* the questions.

1 × 8

(a) The first electron microscope was
discovered by _____.

(Turn Over)

(2)

- (b) The technique of metal coating on the specimen so as to increase the visibility in electron microscope is called _____.
- (c) The process of disruption of suspended cells is known as _____.
- (d) In a spectrophotometer the desired wavelength of light is selected by a component called _____.
- (e) The substance fixed in place for the chromatography procedure is called _____.
- (f) _____ is an anionic detergent used in electrophoresis.
- (g) The positional measure of central tendency is called _____.
- (h) The standard deviation of the sampling distribution of the mean is called _____.

(3)

PART—II

2. Answer any *eight* questions within 2 to 3 sentences. 1.5 × 8
- (a) Magnification
- (b) Freeze etching
- (c) Autoradiography
- (d) Monochromater
- (e) Centrifuge Machine
- (f) Agarose
- (g) Chromatogram
- (h) TLC
- (i) Population
- (j) Range

(4)

PART—III

3. Answer any *eight* questions within 75 words. 2×8

(a) Sample preparation for electron microscope.

(b) Two principles of microscopy

(c) Cryafixation

(d) Ultracentrifugation

(e) Radioisotopes

(f) Paper chromatography

(g) SDS-PAGE

(h) Arithmetic mean

(i) Dispersion

(j) Representation of Data

(5)

PART—IV

Answer the following questions within 500 words. 6×4

4. Describe the fluorescence microscopy.

Or

Give an account of Transmission electron microscope.

5. Describe pulse-chase experiment.

Or

Describe the principles and applications of spectrophotometry.

6. Describe ion-exchange chromatography.

Or

Describe the polyacryl amide gel electrophoresis. (PAGE).

(6)

7. Describe two measures of dispersion.

Or

Describe chi-square test as a test of goodness of fit.

2023

BOTANY

(Paper- Natural Resoruce Management)

Full Marks : 60

Time : 3 hours

Answer from **all** the Parts as directed.

*The figures in the right-hand margin
indicate marks.*

*Candidates are required to give their answers
in their own words as far as practicable.*

PART—I

1. Answer *all* the questions.

1 × 8

(a) The science of growing and cultivating
forest is called _____.

(Turn Over)

(2)

- (b) _____ is a man made resource.
- (c) Delta diversity refers to diversity found in _____.
- (d) _____ is a minor forest product.
- (e) The type of energy obtained from hot spring is _____.
- (f) GIS provide the ability to capture and analyse _____ data.
- (g) The full form of UNEP is _____.
- (h) The waste treatment process described as thermal treatment is called _____.

PART—II

2. Answer any *eight* questions within 2 to 3 sentences. 1.5 × 8

- (a) Define natural resources.
- (b) Define horticulture

(3)

- (c) Lakes
- (d) Define IRR
- (e) What are forests ?
- (f) Geothermal Energy
- (g) Define MSW.
- (h) Solar Energy
- (i) What is waste hierarchy ?
- (j) What is resource accounting ?

PART—III

3. Answer any *eight* questions within 75 words: 2 × 8

- (a) Abiotic resources.
- (b) Soil degradation.
- (c) Bioprospecting

(4)

- (d) Various forest products.
- (e) Define CBD.
- (f) Carbon Footprint
- (g) Bio energy resources
- (h) Agricultural land utilization
- (i) Land fill
- (j) Pyrolysis

PART—IV

Answer the following questions within 500 words.

4. What is sustainable utilization ? Describe the approaches to sustainable utilization. 6

Or

✓ Describe water harvesting technology explaining rain water storage.

(5)

5. What is Biodiversity ? Describe the threats and National Biodiversity Action plan. 6

Or

✓ What are Forests ? Describe the cause of depletion of forest and its management.

6. Describe any four types of energy resources found in nature with examples. 6

Or

Describe the contemporary practices in resource management.

7. Describe the process of waste management. 6

Or

Describe the national efforts in resource management and conservation.