

2022

BOTANY

(Honours)

Paper-CC-BOT-XIII

(*Plant Metabolism*)

Full Marks : 60

Time : 3 hours

Answer all questions.

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

1. Answer *all* the questions : 1 × 8

(a) Glycolysis is a ——— reaction.

(b) Multiple forms of enzyme is called
——— .

(Turn Over)

(2)

- (c) The reaction centre of PS-I is ———.
- (d) ——— is the site of dark reaction of photosynthesis.
- (e) Chemiosmotic theory was proposed by ———.
- (f) ——— step is common in all types of respiration.
- (g) The process of conversion of organic Nitrogen to Ammonia is called ———.
- (h) ——— protects Nitrogenase from oxygen.

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

(3)

- (a) Anabolism
- (b) Allosteric Enzyme
- (c) Antenna molecules
- (d) PS-II
- (e) Q-cycle
- (f) Fermentation
- (g) NADH shuttle
- (h) ATP synthase
- (i) Racker's experiment
- (j) α -oxidation

(4)

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

- (a) Write differences between anabolic and catabolic pathways.
- (b) Covalent modulation.
- (c) Emerson's effect
- (d) Photorespiration
- (e) Kranz Anatomy
- (f) Anaerobic respiration
- (g) Role of Uncouplers
- (h) Difference between oxidative and photophosphorylation

(5)

(i) Glyoxylate cycle

(j) Transamination

Answer the questions within 500 words :

4. What is metabolism ? Describe the regulation of metabolism giving examples. 6

Or

Describe the signal transduction mechanism in Plants.

5. Describe CO_2 assimilation in C_4 plants. 6

Or

Describe Crassulacean Acid Metabolism of CO_2 fixation.

6. Describe TCA cycle. 6

(6)

Or

Describe mitochondrial electron transport.

7. What are lipids ? Describe the process of synthesis of triglycerides.

6

Or

What is Nitrogen fixation ? Describe the mechanism of biological Nitrogen fixation.

2022

BOTANY

(Honours)

Paper-CC-BOT-XIV

(*Plant Biotechnology*)

Full Marks : 60

Time : 3 hours

Answer all questions.

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

1. Answer *all* the questions : 1 × 8

(a) The sum total of genes and its alleles present in crops and its related species is called ——— .

(*Turn Over*)

(2)

- (b) The development of haploid plantlets from pollen grain is termed as _____.
- (c) The enzyme that cleaves DNA at specific base sequence is called _____.
- (d) The enzyme joins together two DNA molecules during recombinant DNA production is _____.
- (e) Complementary DNA is produced using _____ as a template.
- (f) Introduction of DNA into cells by using high voltage electrical pulse is called _____.
- (g) The golden rice contain good quantities of _____.

(Continued)

(3)

- (h) The biological treatment to destroy the hazardous waste is called _____.
2. Answer any *eight* questions within 2 to 3 sentences : 1.5 × 8
- (a) Totipotency
 - (b) Composition of culture medium
 - (c) Cloning vectors
 - (d) Recombinant DNA
 - (e) Genomic libraries
 - (f) Luciferase
 - (g) Complementation

VI-CC-Bot-XIV

(Turn Over)

(4)

(h) Cryopreservation

(i) Edible vaccine

(j) Protease

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

(a) Embryogenesis

(b) Germplasm conservation

(c) Cosmid

(d) YAC

(e) Colony hybridization

(f) Reporter genes

(5)

(g) Microinjection

(h) Humulin

(i) Moondust carnations

(j) Flavr Savr Tomato

Answer *all* the questions within 500 words :

4. What is plant tissue culture ? Describe various aseptic tissue culture techniques. 6

Or

Describe briefly about the protoplast isolation and fusion.

5. Describe the types, biological role and application of Restriction Endonuclease. 6

(6)

Or

What is gene cloning ? Describe PCR mediated gene cloning.

6. What is CDNA library ? Describe the construction and screening of C-DNA libraries.

6

Or

Describe agrobacterium mediated gene transfer.

7. Describe the application of biotechnology in production of pest resistant plant with example.

6

Or

(7)

Describe the role of superbug in Bioremediation.

Total Pages : 5

VI-DSE-Bot-3

2022

BOTANY

Paper-DSE-BOT-III

*(Horticultural Practices and Post-Harvest
Technology)*

Full Marks : 60

Time : 3 hours

Answer all questions.

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

1. Answer *all* the questions :

1 × 8

(a) The study of the production and marketing of fruits is called _____.

(b) The aerial roots of orchid contain multiseriate epidermis of dead cells called _____.

(Turn Over)

(2)

- (c) ——— algae act as biofertilizer.
- (d) Soil less culture is called ———.
- (e) ——— ray is used to preserve fruits and vegetables.
- (f) Full form of IPM is ———.
- (g) Conservation of germplasm in natural habitat is called ———.
- (h) The piece of plant material used in tissue culture is called ———.

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

- (a) Ecotourism
- (b) Define Horticulture.
- (c) Xerophytic characters of Opuntia.
- (d) Biopesticides

(3)

- (e) Cutting method in asexual propagation.
- (f) NPK fertilizers
- (g) Waxing of fruits and vegetables.
- (h) What are predators ?
- (i) Orthodox seed
- (j) Define patents.

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

- (a) Urban horticulture
- (b) Floral characters of Marigold
- (c) Types of Irrigation method
- (d) Grafting method
- (e) Mughal Garden

(4)

- (f) Important features of parks
- (g) Crop sanitation
- (h) The causes of post harvest loss
- (i) Cryopreservation
- (j) Documentation

Long answer questions within 500 words :

4. Describe the scope and importance of Horticulture. 6

Or

What are ornamental plants ? Describe the types and classification of ornamental plants.

5. Describe the sexual reproduction by seed propagation method. 6

Or

(5)

What is urban forestry ? Describe policies and practices.

6. Describe the methods of minimizing losses during storage and transportation of fruits and vegetables. 6

Or

Describe IPM strategies.

7. Describe the role of micropropagation and tissue culture in Horticulture. 6

Or

What is germplasm ? Describe various methods of conservation of germplasm.

Total Number of Pages—5

VI-CC—Bot-XIII

2023

BOTANY

(Plant Metabolism)

Paper — CC-BOT-XIII

Full Marks : 60

Time : 3 hours

Answer all questions

The figures in the right-hand margin indicate marks

SECTION — A

1. Answer *all* the questions :

1 × 8

(a) Phosphorylation is _____ type of enzyme regulation.

(b) When the enzyme is inhibited by the end product of the reaction is called _____

(c) The Q cycle was proposed by _____

(Turn Over)

(2)

(d) Photochemical reaction occurs in _____ part of chloroplast.

(e) _____ cycle has amphibolic role in Respiration.

(f) Substrate level phosphorylation occurs in _____ of cells in Glycolysis.

(g) _____ is a non-symbiotic aerobic bacteria which fix atm. N_2 .

(h) The process of transfer of amino group to a keto acid to form new amino acid is called _____

SECTION - B

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

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

(a) Isozymes.

(b) Second messenger in signal transduction.

(c) Chlorophyll pigments.

(3)

(d) Photolysis of water.

(e) Photophosphorylation.

(f) Anaplerotic reaction.

(g) Boyer's conformation model.

(h) Leguminous plant.

(i) Structure of Triglycerides.

(j) Nitrification.

SECTION - C

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

(a) Catabolism.

(b) Receptors.

(c) Red-drop effect.

(d) Z-scheme of photosynthesis.

(e) Significance of CAM pathway.

(4)

- (f) Pyruvate dehydrogenase complex.
- (g) Cyanide resistant respiration.
- (h) Chemiosmotic hypothesis.
- (i) Gluconeogenesis.
- (j) Ammonification.

SECTION – D

Long answer questions within 500 words: 6 × 4

4. What is signal transduction ? Describe the calcium signalling in plants.

Or

What are the concepts of Metabolism ? Describe various anabolic pathways.

5. Describe the C_3 cycle of photosynthesis.

Or

Describe the process of photorespiration.

(5)

6. Describe the process of glycolysis along with its regulation.

Or

Give an account of Pentose phosphate pathway.

7. Describe α -oxidation of lipid in plants.

Or

Describe the process of symbiotic N_2 fixation in plants.

2023

BOTANY

(*Plant Biotechnology*)

[Honours]

Paper — CC-BOT-XIV

Full Marks : 60

Time : 3 hours

Answer all questions

The figures in the right-hand margin indicate marks

GROUP — A

1. Answer *all* the questions : 1 × 8

(a) PEG is used as _____ in protoplast culture method.

(b) High concentration of Auxin promote _____ in organogenesis.

(*Turn Over*)

(2)

- (c) The recombinant DNA that carry DNA from different sources called _____.
- (d) A vector that can replicate in more than one host organism is called _____.
- (e) The probe isolated from one species and used for another species is called _____.
- (f) Luciferase is a _____ gene.
- (g) Bt Cotton is resistant to _____ insect.
- (h) The first genetically modified flower is _____.

GROUP – B

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

(3)

- (c) ~~Cytokinin~~ role in tissue culture
- (d) ~~Restriction~~ Endonuclease
- (e) Phagemids
- (f) ~~Recombinant~~ DNA
- (g) Probes
- (h) ~~Bioremediation~~
- (i) ~~Transgenic~~ crop
- (j) MAC.

GROUP – C

3. Answer any *eight* questions within 75 words : 2×8
- (a) ~~Define~~ sterilization.
 - (b) ~~Secondary~~ metabolite production in tissue culture.

(4)

- (c) Cryopreservation.
- (d) Gene cloning.
- (e) C-DNA libraries.
- (f) Electroporation.
- (g) Marker gene.
- (h) Asperigillase.
- (i) Genetically engineered human growth hormone.
- (j) Micropropagation.

GROUP – D

Long answer questions within 500 words : 6 × 4

4. Describe the composition of tissue culture media explaining nutrient and hormone requirement. 6

(5)

Or

Describe two applications of tissue culture. 6

5. What is cloning vector ? Describe any two types of prokaryotic vector. 6

Or

Write notes on : 3 × 2

- (i) Bacterial transformation
- (ii) Eukaryotic vectors.

6. Describe direct gene transfer in Recombinant DNA technology method. 6

Or

Write short notes on : 3 × 2

- (i) Colony hybridization
- (ii) GUS.

7. Describe the role of biotechnology in production of transgenic crop with improved quality traits. ₆

OR

write notes on :

3x2

- (i) Herbicide resistant plant
- (ii) Edible vaccine

2023

BOTANY

Paper-DSE-III

Full Marks : 60

Time : 3 hours

Answer all questions.

The figures in the right-hand margin indicate marks.

1. Answer *all* the questions : 1 × 8

(a) The study and marketing of floral crop is known as ———.

(b) A flowering plant dies after flowering once is called ———.

(c) The unwanted plant present in creep field is ———.

(2)

(d) The process of breaking seed coat to promote germination is called _____.

(e) Blanching is a method of _____ of food.

(f) The yellowish and lack of chlorophyll in plant tissue is called _____.

(g) The preservation of germplasm at -196°C in liquid Nitrogen is called _____.

(h) The rapid clonal propagation of plant is called _____.

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

(a) Olericulture

(3)

(b) Climbers

(c) Biofertilizers

(d) Park

(e) Name two fruit crops

(f) Budding

(g) Stratification

(h) Uses of cut flowers

(i) Germplasm

(j) Define IPM.

(4)

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

(a) Two importance of Horticulture

(b) Perennials

(c) Features of succulents

(d) Avenues

(e) Urban forestry

(f) Biopesticides

(g) Principles of preservation of food

(h) Chemical methods of pest control

(5)

(i) Japanese Garden

(j) Post harvest diseases

Long answer questions within 500 words :

4. Describe the role of Horticulture in rural economy and employment generation. 6

Or

Describe salient features of any two : 3×2

(a) Rose

(b) Orchid

(c) Opuntia

(6)

5. Describe any two types of Irrigation methods.

6

Or

Describe the various methods of asexual propagation methods.

6. What is post harvest technology ? Describe the methods of preservation and processing of vegetables and fruits.

6

Or

Describe briefly about the plant quarantine methods.

7. Describe the tissue culture techniques in brief.

6

(7)

Or

What is IPR ? Describe the role of international societies on horticulture.

2024

BOTANY

(*Plant Metabolism*)

Paper — CC-BOT-13

Full Marks : 60

Time : 3 hours

Answer **all** questions

The figures in the right-hand margin indicate marks

SECTION — A

1. Answer *all* the questions : 1 × 8

(a) Synthesis of starch is a _____ pathway.

(b) _____ plants show Kranz anatomy.

(*Turn Over*)

(2)

- (c) Amino acids join together by _____ bonds.
- (d) Emerson carried out experiment in green algae _____.
- (e) Reaction centre of PS-I is _____.
- (f) Photorespiration is a _____ process.
- (g) β -oxidation was discovered by _____.
- (h) CGMP is involved in _____ signaling.

SECTION – B

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

- ☒ (a) Nodule formation
- (b) Cytochromes

(3)

- (c) ATP synthase
- ☒ (d) CAM plants
- ☒ (e) Synthesis of glycerol
- ☒ (f) Nitrate assimilation
- ☒ (g) Carotenoids
- (h) Amphibolic role
- ☒ (i) Red drop
- ☒ (j) Isoenzyme.

SECTION – C

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

- ☒ (a) Allosteric enzyme
- (b) Q-cycle (diagram only)

(4)

- (c) Photolysis of water
- (d) Structure of chlorophyll
- (e) α -oxidation
- (f) Racker's experiment
- (g) Regulation of PDH
- (h) Ammonia assimilation
- (i) Non-leguminous N_2 -fixation
- (j) Regulation of glycolysis.

SECTION – D

Answer long questions within 550 words : 6×4

4. Describe the role of regulatory enzymes.

(5)

Or

Describe catabolic pathways with suitable examples.

5. Describe C-4 pathway and mention differences between C_3 and C_4 pathways.

Or

Give an account of factors affecting CO_2 reduction.

6. Give an account of TCA cycle and mention energy calculation of this cycle.

Or

Describe chemiosmotic mechanism of ATP synthesis.

7. Describe synthesis and breakdown of triglycerides.

(6)

Or

What is gluconeogenesis ? Mention its role in mobilisation of lipids during seed germination.

2024

BOTANY

(*Plant Biotechnology*)

Paper — CC-BOT-14

Full Marks : 60

Time : 3 hours

Answer all questions

The figures in the right-hand margin indicate marks

GROUP — A

1. Answer *all* the questions : 1 × 8

(a) _____ ion is used for protoplast fusion.

(b) Autoclaving is done at _____ °C temperature.

(*Turn Over*)

(2)

- (c) Germplasm conservation at -196°C is called _____.
- (d) PCR technique was first developed by _____.
- (e) Golden rice is used for _____ deficiency.
- (f) _____ is recognition sequence of EcoRI.
- (g) Rapid clonal multiplication through meristem culture is called _____.
- (h) _____ vitamin is more essential for a nutrient medium.

GROUP – B

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

- (a) Totipotency

(3)

- (b) Protoplast isolation
- (c) Ti plasmid
- (d) Cosmid
- (e) Complementation
- (f) Humulin
- (g) Luciferase
- (h) Shuttle vector.

GROUP – C

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

- (a) Hormone requirement for tissue culture
- (b) Type-III restriction endonuclease
- (c) YAC

(4)

- (d) Reporter gene
- (e) Biosafety concerns
- (f) Herbicide resistant plant
- (g) Virus elimination
- (h) Colony hybridization
- (i) Moondust carnation
- (j) PBR 322.

GROUP – D

Answer long questions within 600 words : 6 × 4

4. Give an account of aseptic tissue culture techniques.

Or

Describe the applications of tissue culture.

(5)

5. Give an account of any three types of eukaryotic vectors used in the field of biotechnology.

Or

Describe PCR mediated gene cloning.

6. Give an account of Agrobacterium mediated method of gene transfer.

Or

Describe the process of construction of genomic and c-DNA libraries.

7. Give an account of production of different genetically engineered products.

Or

Describe the role of transgenics in bio-remediation.

2024

BOTANY

Paper — DSE-BOT-3

Full Marks : 60

Time : 3 hours

Answer **all** questions

The figures in the right-hand margin indicate marks

GROUP — A

1. Answer *all* the questions : 1 × 8

(a) _____ ornamental plant is propagated by bulb.

(b) Areca Palm belongs to family _____.

(c) Study of fruit crop is called _____.

(Turn Over)

(2)

- (d) _____ is grafted in wild variety of a stock.
- (e) Full form of IPM is _____.
- (f) Ripening of tomato can be delayed by _____ hormone treatment.
- (g) _____ is a fruit ripening hormone.
- (h) National Horticultural board is located at _____.

GROUP – B

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

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

- (a) Scope of Horticulture
- (b) Ecotourism
- (c) Succulents

(3)

(d) Seed Propagation

- (e) Botanical name and family of Gerbera
- (f) Border irrigation
- (g) Quality traits of fruits
- (h) Name of winter annual plants (any *two*)
- (i) Micropropagation
- (j) Grafting.

GROUP – C

3. Answer any *eight* questions within *75* words :

2×8

- (a) Crop sanitation
- (b) Quarantine practice
- (c) Drip irrigation

(4)

(d) Air layering

(e) Branches of Horticulture

(f) Hydroponics

(g) Vitamin-C rich fruits

(h) Orchids

(i) Harvesting of cut flowers

(j) Horticulture in rural economy.

GROUP – D

Answer all questions within 500 words : 6 × 4

4. Describe types and classification of annual, perennials and climber ornamental plants.

(5)

Or

Write the salient features of marigold, tuberose, poppies, sages.

5. Give an account of different gardening traditions.

Or

Describe management and marketing of vegetable and fruit crops.

6. Describe different methods of minimizing losses during storage and transportation.

Or

Describe genetic, biological and chemical methods of pest control.

(6)

7. Describe different varieties and cultivars of various horticultural crops.

Or

Describe the role of micro-propagation in tissue culture.