

2021

( 6th Semester )

*Time : 3 hours*

*Full Marks : 60*

Answer from **both** the Sections as per direction

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

*Candidates are required to answer in their own words as far as practicable*

**( PLANT METABOLISM )**

SECTION – A

1. Answer *all* questions : 2 × 6
- (a) Phosphorylation
  - (b) PS-I
  - (c) ATP synthase
  - (d) What is PPP ?
  - (e) What is  $\alpha$ -oxidation ?
  - (f) Nitrate assimilation.

SECTION – B

Answer **all** questions : 12 × 4

2. Describe the C<sub>3</sub> cycle of photosynthesis.

*Or*

Write notes on :

- (i) Antenna molecule and reaction centres
  - (ii) Factors affecting CO<sub>2</sub> reduction.
3. Discuss the TCA cycle in plants.

*(Turn Over)*

( 2 )

*Or*

Write notes on :

- (i) Chemiosmotic mechanisms
- (ii) ETC.

4. Describe the  $\beta$ -oxidation of fatty acids.

*Or*

Write notes on :

- (i) Metabolisms of lipids during seed germination
- (ii) Glyoxylate cycle.

5. Describe the biological nitrogen fixation in legumes.

*Or*

Write notes on :

- (i) Nitrate assimilation
- (ii) Transamination.

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**( PLANT BIOTECHNOLOGY )**

SECTION – A

1. Answer *all* the questions : 2 × 6
- (a) Totipotency
  - (b) What is androgenesis ?
  - (c) PCR
  - (d) Lambda phage
  - (e) Electroporation
  - (f) Biosafety.

SECTION – B

Answer **all** questions : 12 × 4

2. Discuss the embryogenesis and its applications.

*Or*

Write notes on :

- (i) Secondary metabolites
  - (ii) Nutrient and hormone requirement in Tissue culture.
3. Describe the history, types, biological role and application of Restriction endonuclease.

*(Turn Over)*

( 2 )

*Or*

Write notes on :

- (i) Construction of genomic DNA library
- (ii) Colony hybridization.

4. Discuss the direct gene transfer methods to the plants.

*Or*

Write notes on :

- (i) Selectable markers
- (ii) Reporter genes.

5. Discuss the applications of biotechnology for transgenic crops with improved quality traits.

*Or*

Write notes on :

- (i) Roundup Ready Soybean
- (ii) Superbug.

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Total Pages—3

SHBOT-13

2020

( 6th Semester )

Time : 3 hours

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as far as practicable*

Draw neat labelled diagrams wherever necessary

( PLANT METABOLISM )

SECTION - A

1. Answer all questions :

2 x 6

- (a) Light Harvesting Complex
- (b) CAM plants
- (c) What is ETC ?
- (d) Symbiotic nitrogen fixation

( Turn Over )

(e) Transamination

(f) What are simple lipids ?

SECTION - B

Answer all questions : 12 x 4

2. Give a detailed account of light reaction of Photosynthesis.

Or

Write notes on :

(i) Q-cycle

(ii) Photorespiration.

3. Describe the Glycolytic pathway and its importance.

Or

Write notes on :

(i) Anaerobic respiration

(ii) Glyoxylate pathway.

4. Describe the process of Synthesis of a triglyceride.

Or

Write notes on :

(i) Omega( $\omega$ )-oxidation

(ii) Fatty acids.

5. Give a brief account of physiology and biochemistry of Nitrogen fixation.

Or

Write notes on :

(i) Abiotic nitrogen fixation

(ii) Ammonia assimilation.

2020

( 6th Semester )

Time : 3 hours

Full Marks : 60

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as far as practicable*

Draw neat labelled diagrams wherever necessary

( PLANT BIOTECHNOLOGY )

SECTION - A

1. Answer all questions : 2 x 6

- (i) Cryopreservation
- (ii) Culture medium
- (iii) YAC
- (iv) Restriction endonuclease

( Turn Over )

- (v) Selectable marker
- (vi) Edible vaccine

SECTION - B

Answer all questions : 12 x 4

- 2. Give an account of isolation, culture and fusion of protoplast.

Or

Write notes on :

- (i) Micropropagation
- (ii) MS medium.

- 3. What is Recombinant DNA technology ? Discuss various uses of the technology.

Or

Write notes on :

- (i) Cloning vector
- (ii) Restriction endonuclease.

- 4. Discuss the role of *Agrobacterium* and its plasmids in transformation of higher plants.

Or

Write notes on :

- (i) Particle gun method
- (ii) GUS

- 5. Describe the role of transgenics in bioremediation.

Or

Write notes on :

- (i) Bt-cotton
- (ii) Industrial Enzymes.

2020

( 6th Semester )

Time : 3 hours

Full Marks : 60

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Draw neat labeled diagrams wherever necessary

**( NATURAL RESOURCE MANAGEMENT )**

SECTION - A

1. Answer *all* questions : 2 x 6

- (i) Sustainable use of natural resources
- (ii) Soil degradation
- (iii) IPR
- (iv) Social forestry

( Turn Over )

( 2 )

- (v) Minor forest products  
(vi) Wetlands.

SECTION-B

Answer all questions :

12 x 4

2. Give a detailed account of Non-renewable natural resources.

Or

Write notes on :

- (i) Mineral resources  
(ii) Economic and Ecological importance of natural resources.

3. Describe water resources. Give an account of threats and management strategies.

Or

Write notes on :

- (i) Soil degradation  
(ii) Estuarine wetlands.

SD BOT -03

(Continued)

( 3 )

4. Define Biodiversity. Describe the strategies for conservation of biodiversity.

Or

Write notes on :

- (i) Bioprospecting  
(ii) Threats to Biodiversity.

5. Give an account of Forests and their importance. Mention about the management of forest resource.

Or

Write notes on :

- (i) Agroforestry  
(ii) Waste management.

SD BOT -03

BA-1600

2019

( 6th Semester )

Time :  $2\frac{1}{2}$  hours

Full Marks : 60

Answer from both the Sections as per direction

The figures in the right-hand margin indicate marks

Candidates are required to answer in their own words as far as practicable

( PLANT METABOLISM )

SECTION—A

1. Answer all questions :

- (a) RUBISCO
- (b) Kranz Anatomy
- (c) Photosynthetic unit
- (d) Non-symbiotic Nitrogen fixation

2 x 6

( Turn Over )

( 2 )

- (e) Role of gluconeogenesis
- (f) Differentiate between  $C_3$  and  $C_4$  plants.

SECTION - B

Answer all questions : 12 x 4

2. Trace the path of Carbon in  $C_3$  plants.

Or

Write notes on :

(i) Photophosphorylation

(ii)  $C_4$  pathway.

3. Briefly discuss TCA cycle. Explain its amphibolic nature.

Or

Write notes on :

(i) Oxidative phosphorylation

(ii) Mitochondrial Electron Transport.

SHBOT-13

(Continued)

( 3 )

4. Describe the mechanism of  $\beta$  oxidation. How does  $\alpha$  oxidation differ from  $\beta$  oxidation.

Or

Write notes on :

(i) Synthesis of fatty acid

(ii) Glycerol synthesis.

5. Enumerate the mechanism of symbiotic Nitrogen Fixation in plants.

Or

Write notes on :

(i) Nitrification and Denitrification

(ii) Reductive amination.

SHBOT-13

BA-1500

2019

( 6th Semester )

Time : 2½ hours

Full Marks : 60

Answer from both the Sections as per direction

The figures in the right-hand margin indicate marks

Candidates are required to answer in their own words as far as practicable

(PLANT BIOTECHNOLOGY)

SECTION—A

1. Answer all questions :

2 × 6

- (a) Plasmid
- (b) Totipotency
- (c) cDNA
- (d) Microinjection
- (e) Golden rice
- (f) Embryogenesis.

( Turn Over )

( 2 )

SECTION - B

Answer all questions : 12 x 4

2. Give a brief account of Tissue culture technique and discuss the nutritional requirement for callus culture.

Or

Write notes on :

- (i) Protoplast isolation, culture and fusion
- (ii) Application of tissue culture.

3. What is recombinant DNA ? Briefly describe the various tools used for the construction of recombinant DNA.

Or

Write notes on :

- (i) PCR mediated gene cloning
- (ii) DNA library.

SHBOT-14

( Continued )

( 3 )

4. Discuss the various methods of gene transfer.

Or

Write notes on :

- (i) Organisation of nod and nif genes and their role in Nitrogen fixation
- (ii) Biofertilizer.

5. What is genetically modified crop or GM crop ? Enumerate your answer with suitable examples.

Or

Write notes on :

- (i) Role of Transgenic in Bioremediation
- (ii) Transgenic food with improved quality traits.

SHBOT-14

BA-1,500

2019

( 6th Semester )

Time :  $2\frac{1}{2}$  hours

Full Marks : 60

Answer from both the Sections as per direction

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**( NATURAL RESOURCE MANAGEMENT )**

SECTION—A

1. Answer all questions :

2 × 6

- (a) Silviculture
- (b) Mineral resource conservation
- (c) What is meant by resources ?
- (d) Agroforestation

( Turn Over )

( 2 )

- (e) Chipko movement
- (f) Fish resource.

SECTION - B

Answer all questions : 12 × 4

2. What is meant by natural resource ? Give an account of different natural resources with special reference to India.

Or

Write notes on :

- (i) Increasing pressure on natural resource
- (ii) Sustainable utilization.

3. What is soil conservation ? What are the principles and various methods of soil conservation.

Or

Write notes on :

- (i) Water logging and salinity
- (ii) River valley project.

SD BOT - 03

( Continued )

( 3 )

4. What is Biological diversity and why there should be conservation ? What are the types of Biological diversity ? Whether there should be any need for integration of biodiversity with science and technology explain ?

Or

Write notes on :

- (i) National Biodiversity action plan
- (ii) In situ and ex situ conservation.

5. What is desertification ? Give an account of the chief factors responsible for desertification ?

Or

Write notes on :

- (i) Waste Management
- (ii) Major and minor forest products—Depletion and Management.

SD BOT - 03

BA - 1500

2019

( 6th Semester )

Time :  $2\frac{1}{2}$  hours

Full Marks : 60

Answer from both the Sections as per direction

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( **BIOSTATISTICS** )

**SECTION – A**

1. Answer *all* questions :  $2 \times 6$

- (a) Antilogarithm
- (b) Sampling
- (c) Coefficient of variation
- (d) Frequency curve

( Turn Over )

- (e) Cumulative frequency  
(f) Arithmetic mean.

## SECTION - B

Answer all questions : 12 × 4

2. Define Statistics. Discuss their methods and basic principles.

Or

Write notes on :

- (i) Frequency polygon  
(ii) Limitation and uses of statistics.

3. Explain how central tendencies are measured with suitable examples.

Or

Write notes on :

- (i) Classification of data  
(ii) Methods of sampling.

4. Calculate mean, median, and mode from the data given in the following table regarding the number of pods per plant in a pea orchard.

No. of pods	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65
No. of plants	4	4	9	7	13	3	3	2	2	3

Or

Write notes on :

- (i) Standard deviation  
(ii) Co-efficient of variation.

5. What is chi-square and students *t*-text ? Explain how their analysis helps to understand the data better.

Or

Write notes on :

- (i) Types and methods of correlation  
(ii) Application of chi-square test.

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**( NATURAL RESOURCE MANAGEMENT )**

SECTION – A

1. Answer *all* the questions : 2 × 6
- (a) Sociocultural approaches of sustainable utilization of natural resources.
  - (b) Horticultural utilization of lands.
  - (c) Estuarine
  - (d) CBD
  - (e) Depletion Management.
  - (f) Non-renewable energy sources.

SECTION – B

Answer **all** questions : 12 × 4

2. Define natural resources. Discuss sustainable utilization of natural resources.

*Or*

Write notes on :

- (i) Types of natural resources
  - (ii) Renewable natural resources.
3. Describe the utilization of land for agriculture and Silviculture. Discuss its managements.

*(Turn Over)*

( 2 )

*Or*

Write notes on :

(i) Fresh water management

(ii) Marine wetland.

4. Describe in details about the national biodiversity action plan in India.

*Or*

Write notes on :

(i) IPR

(ii) Significance of Biodiversity.

5. Describe the renewable and non-renewable sources of energy.

*Or*

Write notes on :

(i) Depletion management

(ii) Forest Cover.

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( **BIOSTATISTICS** )

SECTION – A

1. Answer *all* questions : 2 × 6
- (a) What is basic principles of biostatistics ?
  - (b) Tabulation
  - (c) Sampling methods.
  - (d) Mode.
  - (e) Regression
  - (f) What is fitting prediction ?

SECTION – B

Answer **all** questions : 12 × 4

2. Describe the basic principles of statistical methods and its limitations.

*Or*

Write notes on :

- (i) Function and uses of statistics
  - (ii) Variables.
3. Describe the classification, tabulation and presentation of data in bio-statistics.

*(Turn Over)*

( 2 )

*Or*

Write notes on :

(i) Types of data collection

(ii) Sampling methods.

4. Discuss the mean, mode, median and its merits and demerits ?

*Or*

Write notes on :

(i) Co-efficient of variation

(ii) Standard deviation.

5. Describe the types and methods of correlation and regression.

*Or*

Write notes on :

(i) Fitting prediction

(ii) *t*-test.

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