

2 0 1 7

( 6th Semester )

BOTANY

NINTH PAPER

( **Pteridophyta, Gymnosperm, Paleobotany  
and Palynology** )

Full Marks : 55

Time : 2½ hours

( PART : B—DESCRIPTIVE )

( Marks : 35 )

*The figures in the margin indicate full marks  
for the questions*

1. Write the system of classification of Pteridophyta. 7

Or

Write accounts on any *two* of the following :  
3½×2=7

- (a) Heterospory
- (b) Development of Sporangia
- (c) Telome theory

2. Write notes on the morphology and reproduction of *Marsilea*. 7

Or

Discuss the characteristics and distribution of calamites.

3. Describe the structure of male and female strobili of *Ephedra*. 7

Or

Describe the structure of male and female strobili of *Taxus*.

4. Write notes on phylogenetic trends in gymnosperms. 7

Or

Write notes on any *two* of the following :  
3½×2=7

- (a) General account of archegonia
- (b) Economic importance of gymnosperms
- (c) Distribution of living gymnosperms in India

( 3 )

5. What is palynology? Describe the pollen morphology with suitable diagram. 1+6=7

Or

Write short notes on any *two* of the following : 3½×2=7

- (a) Geological time scale
- (b) Gondwana flora
- (c) Pollen allergy

★★★

**Subject Code : BOT/VI/09**

**Booklet No. A**

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**BOT/VI/09**

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( 6th Semester )

**BOTANY**

NINTH PAPER

**( Pteridophyta, Gymnosperm, Paleobotany  
and Palynology )**

( PART : A—OBJECTIVE )

( Marks : 20 )

*The figures in the margin indicate full marks for the questions*

SECTION—A

( Marks : 5 )

- 1.** Put a Tick (✓) mark against the correct answer in the brackets provided : 1×5=5

(a) The sorus may be protected by a revolute margin or by a special outgrowth called

(i) indusium ( )

(ii) leaf gaps ( )

(iii) megaphyllous ( )

(iv) None of the above ( )

( 2 )

(b) Marsilea belongs to the class

(i) Eusporangiopsida ( )

(ii) Leptosporangiopsida ( )

(iii) Lycophytopsida ( )

(iv) Sphenophytopsida ( )

(c) In *Ephedra*, the stalk bears

(i) 2–8 microsporangia ( )

(ii) 2–7 microsporangia ( )

(iii) 2–6 microsporangia ( )

(iv) 2–5 microsporangia ( )

( 3 )

(d) Which one of the following is regarded as a living fossil?

(i) *Taxus baccata* ( )

(ii) *Ginkgo biloba* ( )

(iii) *Gnetum ula* ( )

(iv) None of the above ( )

(e) Pollen grains have a hard coat made of

(i) sporopollenin ( )

(ii) sporogeneous tissue ( )

(iii) sporocytes ( )

(iv) All of the above ( )

( 4 )

SECTION—B

( Marks : 15 )

**2.** Write notes on the following :

3×5=15

(a) Sori of Pteridophytes

( 5 )

(b) Sporocarp of Marsilea

( 6 )

(c) Character of Lepidodendron

( 7 )

(d) Classification of gymnosperms

( 8 )

(e) Features of Cordaites

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**2 0 1 7**

( 6th Semester )

**BOTANY**

**TENTH PAPER**

**( Angiosperm Taxonomy, Anatomy  
and Embryology )**

*Full Marks : 55*

*Time : 2½ hours*

( PART : B—DESCRIPTIVE )

( Marks : 35 )

*The figures in the margin indicate full marks  
for the questions*

- 1.** Give the outline system of classification of angiosperms by Bentham and Hooker. Discuss its merits and demerits. 5+2=7

*Or*

What do you mean by phylogenetic system of classification of angiosperms? Write in brief the outline system of classification of angiosperms proposed by John Hutchinson. 2+5=7

- 2.** Discuss in brief the evolution of angiosperm. 7

*Or*

What do you mean by Botanical Garden? Describe any two important Botanical Gardens studied by you. 2+2½+2½=7

- 3.** Describe distinguishing characters of the family Fabaceae. Mention its economic importance. 5+2=7

*Or*

Describe the floral characters of the following families : 3½+3½=7

(a) Scrophulariaceae

(b) Verbenaceae

- 4.** What is normal secondary growth? How does it differ from anomalous secondary growth? Discuss normal secondary growth in stem. 1½+1½+4=7

*Or*

What do you mean by xerophyte? Describe anatomical features of xerophytic plants with suitable diagram. 2+5=7

( 3 )

5. What is cross pollination? Discuss contrivances for cross pollination.  $2+5=7$

*Or*

Define bisporic and tetrasporic embryo sacs. Discuss in brief with diagrams the following embryo sacs :  $1\frac{1}{2}+1\frac{1}{2}+2+2=7$

(a) *Allium* type

(b) *Peperomia* type

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**Subject Code : BOT/VI/10**

**Booklet No. A**

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( 6th Semester )

**BOTANY**

TENTH PAPER

**( Angiosperm Taxonomy, Anatomy and Embryology )**

( PART : A—OBJECTIVE )

( Marks : 20 )

*The figures in the margin indicate full marks for the questions*

SECTION—A

( Marks : 5 )

Put a Tick (✓) mark against the correct answer in the brackets provided : 1×5=5

**1.** Which of the following botanists proposed numerical values for classification of plants?

(a) R. R. Sokal ( )

(b) P. H. A. Sneath ( )

(c) Michel Adanson ( )

(d) A. J. Cole ( )

( 2 )

2. Which of the following taxonomists for the first time initiated the art of preparation of herbarium?

- (a) Luca Ghini ( )
- (b) Gherardo Cibo ( )
- (c) John Falconer ( )
- (d) Pitton de Tournefort ( )

3. Only one functional and epipetalous stamen is found in the family

- (a) Liliaceae ( )
- (b) Cyperaceae ( )
- (c) Verbenaceae ( )
- (d) Zingiberaceae ( )

4. Which of the following is termed as normal vascular tissue?

- (a) Cambium ( )
- (b) Endodermis ( )
- (c) Cortex ( )
- (d) All of the above ( )

( 3 )

5. Which one of the following embryonic cells is a part of egg apparatus?

(a) Synergids ( )

(b) Antipodal nucleus ( )

(c) Polar nucleus ( )

(d) None of the above ( )

( 4 )

SECTION—B

( Marks : 15 )

Write notes on the following in brief :

3×5=15

**1. Chemotaxonomy**

( 5 )

2. Importance of field notebook in herbarium preparation

( 6 )

**3.** Perianth character of Orchidaceae

( 7 )

4. Anatomical features of hydrophyte

( 8 )

5. Nuclear endosperm

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**2 0 1 7**

( 6th Semester )

**BOTANY**

**ELEVENTH PAPER**

**( Plant Metabolism, Biochemistry, etc. )**

*Full Marks : 55*

*Time : 2½ hours*

( PART : B—DESCRIPTIVE )

( Marks : 35 )

*The figures in the margin indicate full marks  
for the questions*

1. Elucidate the mechanism of DNA replication. 7

*Or*

Write notes on the following :  $3\frac{1}{2}+3\frac{1}{2}=7$

- (a) Synthesis of cellulose  
(b) Synthesis of amino acids

2. Write an account on protein synthesis. 7

*Or*

Give brief accounts on the following :

$3\frac{1}{2}+3\frac{1}{2}=7$

- (a) Enzyme kinetics  
(b) Induced fit model of enzyme action

3. Write notes on biosynthesis of—

- (a) auxins;  
(b) gibberellins.  $3\frac{1}{2}+3\frac{1}{2}=7$

*Or*

Write accounts on the mode of action of the following :  $3\frac{1}{2}+3\frac{1}{2}=7$

- (a) Cytokinins  
(b) Abscisic acid

4. Describe the mechanisms of cyclic and non-cyclic electron transports. 7

*Or*

Give brief accounts on the following :

$3\frac{1}{2}+3\frac{1}{2}=7$

- (a) Reaction centers  
(b) Harvestation of light energy

( 3 )

5. What is thermodynamics? Explain the causes of thermodynamics.  $2+5=7$

*Or*

Define enthalpy change and entropy change with examples.  $3\frac{1}{2}+3\frac{1}{2}=7$

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Subject Code : BOT/VI/11

Booklet No. **A**

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( 6th Semester )

**BOTANY**

ELEVENTH PAPER

**( Plant Metabolism, Biochemistry, etc. )**

( PART : A—OBJECTIVE )

( Marks : 20 )

*The figures in the margin indicate full marks for the questions*

SECTION—A

( Marks : 5 )

- 1.** Put a Tick (✓) mark against the correct answer in the brackets provided : 1×5=5

(a) Prokaryotic DNA polymerase-I consists of two fragments, one of which is

(i) Okazaki fragment ( )

(ii) Klenow fragment ( )

(iii) leading strand ( )

(iv) replication fork ( )

( 2 )

(b) Protein synthesis takes place in

(i) ribosome ( )

(ii) Golgi body ( )

(iii) cytoplasm ( )

(iv) mitochondria ( )

(c) The main pathway of gibberellic acid synthesis has been worked out in

(i) *Gibberella fujikuroi* ( )

(ii) *Gibberella caudatus* ( )

(iii) *Cannabis sativa* ( )

(iv) *Phoenix dactylifera* ( )

( 3 )

(d) All energy absorbing pigments except chlorophyll are called

(i) essential pigments ( )

(ii) accessory pigments ( )

(iii) subsidiary pigments ( )

(iv) secondary pigments ( )

(e) Adiabatic process is

(i) one in which heat is neither gained nor lost by the system ( )

(ii) one in which heat is transferred out of the system ( )

(iii) one in which heat goes into the system ( )

(iv) one in which heat is displaced to the surroundings ( )

( 4 )

SECTION—B

( Marks : 15 )

2. Write notes on the following :

3×5=15

(a) Biological N-fixation

( 5 )

(b) Allosteric enzymes

( 6 )

(c) Biosynthesis of ethylene

( 7 )

(d) Photosynthetic apparatus

( 8 )

(e) Gibbs free energy

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**2 0 1 7**

( 6th Semester )

**BOTANY**

TWELFTH PAPER

**( Plant Biotechnology and Experimental Embryology )**

*Full Marks : 55*

*Time : 2½ hours*

( PART : B—DESCRIPTIVE )

( Marks : 35 )

*The figures in the margin indicate full marks for the questions*

1. Describe the steps involved in recombinant DNA technology. 2+5=7

*Or*

Write notes on the following : 3½+3½=7

(a) PCR

(b) Methylase

2. Briefly describe the Agrobacterium-mediated gene transformation. 7

*Or*

Write notes on the following : 3½+3½=7

(a) Transgenic plant production

(b) Reporter gene in plants

3. Define cryopreservation. Briefly describe the procedure of cryopreservation of plants. 2+5=7

*Or*

Write notes on the following : 3½+3½=7

(a) Synthetic seeds

(b) Sterilization techniques in tissue culture

4. Give an account of genetically modified organisms with special emphasis on Golden Rice. 7

*Or*

Write notes on the following : 3½+3½=7

(a) Significance of biotechnology in agriculture

(b) Plantibodies

( 3 )

5. What is somatic embryogenesis? Describe the developmental patterns of somatic embryos.  $2+5=7$

*Or*

Write notes on the following :  $3\frac{1}{2}+3\frac{1}{2}=7$

(a) Cybrid

(b) Protoplast fusion

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**Subject Code : BOT/VI/12**

**Booklet No. A**

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( 6th Semester )

**BOTANY**

TWELFTH PAPER

**( Plant Biotechnology and Experimental Embryology )**

( PART : A—OBJECTIVE )

( Marks : 20 )

*The figures in the margin indicate full marks for the questions*

Answer **all** questions

SECTION—A

( Marks : 5 )

- 1.** Put a Tick (✓) mark against the correct answer in the brackets provided : 1×5=5

(a) The microorganism known as nature's genetic engineer is

(i) *Bacillus thuringiensis* ( )

(ii) *Bacillus subtilis* ( )

(iii) *Agrobacterium tumefaciens* ( )

(iv) *Erwinia uredovore* ( )

( 2 )

(b) Transgenic tomato ripe slower due to the antisense gene encoding the enzyme

(i) phytase ( )

(ii) polygalacturonase ( )

(iii) ribozyme ( )

(iv) lipase ( )

(c) The tissue obtained from a plant to be cultured is called

(i) somatic embryo ( )

(ii) protoplast ( )

(iii) cybrid ( )

(iv) explant ( )

( 3 )

(d) Bt-Cotton is a genetically modified organism which produces

(i) rodenticides ( )

(ii) bactericides ( )

(iii) insecticides ( )

(iv) herbicides ( )

(e) Protoplast culture is done in

(i) MS media ( )

(ii) PDA media ( )

(iii) Beef agar media ( )

(iv) Chu-10 media ( )

( 4 )

SECTION—B

( Marks : 15 )

2. Write notes on the following :

3×5=15

(a) Ligase

( 5 )

(b) Gene gun

BOT/VI/12/438

( 6 )

(c) Totipotency

BOT/VI/12/438

( 7 )

(d) Bt-Brinjal

BOT/VI/12/438

( 8 )

(e) Micropropagation

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