

2018

BOTANY

(Major)

Paper : 6.1

(Molecular Biology and Plant Biochemistry)

Full Marks : 60

Time : 3 hours

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

1. Fill in the blanks with appropriate words : 1×7=7

(a) In 1960, _____ discovered flip-flop and lateral diffusion of phospholipids in cell membrane.

(b) In translation process, the enzyme _____ helps the peptide bond formation between two amino acids.

(c) An operon contains multiple genes under the control of one _____.

(d) The unit of DNA in which individual acts of replication occur is called the _____.

(2)

(e) The enzyme binds with the reactants and brings them very close and in proper orientation so that the reacting groups may easily react. This effect is known as _____.

(f) Fructose 1, 6-biphosphate is cleared into two three carbon molecules in the presence of _____ enzyme.

(g) Pyrimidine dimers are formed as a result of _____ radiations.

2. Define the following in brief :

(a) Nitrogenase enzyme

2×4=8

(b) Exons

(c) Base analogues

(d) DNA priming

3. Write short notes on any three of the following :

(a) Degeneracy of the genetic code

5×3=15

(b) Exo and endo forms of monosaccharides

(c) Fine structure of a gene

(d) Frameshift mutation

8A/910

(Continued)

(3)

4. Answer any three of the following : 10×3=30

(a) Describe RNA polymerase and the initiation of RNA synthesis in prokaryotes. What are factor dependent method and intrinsic termination method?

(b) Explain free energy change and reaction equilibrium of enzyme action. Define action site of the enzyme.

(c) Define inducible system. Discuss the 'lac operon' gene expression and regulation in prokaryotes.

2+8=10

(d) What is biological nitrogen fixation? Describe the process of root nodule formation. What is conformational and respiratory protection of nitrogenase enzyme?

(e) Distinguish between disaccharides and polysaccharides. Discuss in detail about the structure and formation of polysaccharides.

2+8=10

8A—4500/910

3 (Sem-6) BOT M 1

2018

BOTANY

(Major)

Paper : 6.2

(**Bioinformatics, Computer Application
and Biotechnology**)

Full Marks : 60

Time : 3 hours

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

1. Fill in the blanks with appropriate word(s) :

1×7=7

- (a) Google Chrome is a/an _____.
- (b) The full form of HTML is _____.
- (c) If a computer provides database services to other, then it will be known as _____.
- (d) On a double-stranded DNA, if reading 5' to 3' on one strand matches the sequence reading 5' to 3' on the complementary strand, such sequence is called as _____.

(2)

(e) _____ codes are used to represent alphanumeric data in computer.

(f) The full form of 'EMBL' database is _____.

(g) FTP stands for _____.

2. Define the following :

(a) Homology search

(b) Central dogma of life

(c) Ti plasmid

(d) Proteomics

2×4=8

3. Write briefly on any *three* of following : 5×3=15

(a) Programming languages used in bioinformatics

(b) Somaclonal variations

(c) Principle of Maxam-Gilbert DNA sequencing

(d) DNA library

(e) Embryo rescue in tissue culture

8A/911

(Continued)

(3)

4. Answer any *three* of the following : 10×3=30

(a) Describe an example of successful drug designing with the help of bioinformatics. 10

(b) Explain the methods of tissue sterilization and culture techniques followed in tissue culture. 10

(c) Define DNA fingerprinting. Explain how it can be applied in different fields of modern biology. 3+7=10

(d) Describe the process of obtaining a transgenic plant through genetic engineering. 10

(e) Define restriction enzyme. "Isolated restriction enzymes are used to manipulate DNA for different scientific applications." Discuss. 2+8=10

(f) Classify different types of computers. Make a comparison between modern computer and old-days computer. 5+5=10

8A-4500/911

3 (Sem-6) BOT M 2

3 (Sem-6) BOT M 4

2 0 1 8

BOTANY

(Major)

Paper : 6.4

(Plant Resource Utilization)

Full Marks : 60

Time : 3 hours

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

1. Fill in the blanks :

1×7=7

(a) Reserpine is obtained from the plant
_____.

(b) The Red Dammar is obtained from
_____.

(c) The term 'ethnobotany' was coined
by _____.

(d) The major alkaloid constituent of Neem
plant is _____.

(e) The aerial part of banana plant is made
up of _____.

(2)

- (f) *Hevea* or para rubber is extracted from the plant which scientific name is _____.
- (g) The major constituent of coffee is _____.

2. Write on/Answer the following in brief : $2 \times 4 = 8$

- (a) Mention the scientific names, families and uses of the following :
- (i) Turmeric
- (ii) Ginger
- (b) What are the products of soya bean? State their uses.
- (c) Plant introduction
- (d) Medicinal values of bay leaf

3. Answer any *three* of the following questions : $5 \times 3 = 15$

- (a) Give an account of the origin of cultivated plants.
- (b) What is crop domestication? Describe the process of domestication of crop plants.
- (c) Write notes on crude drugs and commercial drugs.
- (d) State the products and uses of Cocoa. Briefly describe the Cocoa processing.
- (e) Write a note on the by-products of sugar industry.

(Continued)

(3)

Answer any *three* of the following questions : $10 \times 3 = 30$

- (a) What do you mean by Green Revolution? Write a detailed description on Green Revolution.
- (b) Write the scientific names, families, products and uses of the following plants :
- (i) Tea
- (ii) Cotton
- (c) What are timber plant resources? Give an account of timber plant resources of North-East India.
- (d) What is IPR (Intellectual Property Right)? Discuss how IPR is helpful in safeguarding the vast diversity of traditional products of different communities of India.
- (e) Give an account of the classification of plant resources.
- (f) What are the different disciplines of ethnobotany? Give an account of development of ethnobotany in India.

3 (Sem-6) BOT M 3

2018

BOTANY

(Major)

Paper : 6.3

(**Plant Physiology**)

Full Marks : 60

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Answer the following questions : 1×7=7

- (a) A cell has osmotic potential of -12 bars and its pressure potential is 8 bars. Find out its water potential.
- (b) Name the element which forms the core constituent of the ring structure of chlorophyll.
- (c) Name the metal present in the water splitting complex associated with photosynthesis.
- (d) What is the site of functioning of catalase?

(2)

- (e) Which is the most important limiting factor in photosynthesis?
(f) Who coined the term 'vernalization'?
(g) Under water stress condition what is the most common amino acid accumulated in plants?

2. Answer the following questions :

2×4=8

- (a) What is photorespiration?
(b) What is the role of molybdenum in plants?
(c) Name the essential cofactors required for the formation of acetyl coenzyme-A.
(d) What is the significance of osmotic potential?

3. Answer any three of the following :

5×3=15

- (a) Describe the role of K^+ in opening of stomata
(b) Describe the ion Pump theory of salt absorption
(c) Define stress. Describe briefly xenobiotic stress with example.
(d) Describe how radioactive tagging technique is used in understanding bidirectional movement of solute in plants.
(e) Briefly explain the pathway of CAM.

(Continued)

(3)

4. (a) How are solutes translocated from source to sink? Describe the mechanism with modern theory. Justify the acceptability of the theory. 7+3=10

Or

Mention the properties of water important to plants. Justify "Transpiration is a necessary evil". 5+5=10

- (b) Justify "C₄ cycle is more efficient than C₃ cycle". Describe C₄ cycle with proper pathway and explanation. 3+7=10

Or

What is the function of electron transport system in mitochondria? How does it work and from what source it derive reducing power for operation? 3+7=10

- (c) Describe the possible role of auxin for apical dominance and abscission. 5+5=10

Or

What is dormancy? Explain the methods used and principle involved to break seed dormancy. 2+8=10
