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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) Chunks of DNA called _____ are added to the lagging strand in the 5′ to 3′ end.

(b) Enzyme _____ breaks the hydrogen bonds holding the complementary bases of DNA together.

(c) The cooling regions of a nucleotide sequence is called _____.

(d) DNA molecules are tightly wound around and packed in structures called chromosomes, which consist of long chains of DNA and _____.

(Turn Over)

(e) The _____ number is a numerical scheme for enzymes, based on chemical reactions they catalyze.

(f) A haemoglobin like compound found in root nodule of leguminous plants is called _____.

(g) The enzyme which catalyze group transfer is called _____.

2. Define the following in brief :

$2 \times 4 = 8$

(a) Introns

(b) Tautomerization

(c) Nitrogenase enzyme

(d) Histone proteins

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

$5 \times 3 = 15$

(a) Point mutation and its role in transition

(b) Root nodule formation

(c) Base analogs

(d) Structure and formation of disaccharides

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

(a) Define transcription. Explain with proper illustration the process of translation in prokaryotes.

(Continued)

(b) Describe the first step in DNA replication. What are primers? Elucidate its role in DNA replication.

(c) Define enzymes and co-factors. Discuss the classification and nomenclature system of enzymes.

(d) Discuss physical nitrogen fixation. Explain the mechanism of conversion of nitrate to ammonia. What is GS/GOGAT system?

(e) Define carbohydrates. Explain the role of glycosidic bonds in construction of polymers of sugars.

Or

Define starch. Briefly describe monosaccharides, disaccharides and polysaccharides. Give representative structural formulas.

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2017

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) :

$1 \times 7 = 7$

(a) In tissue culture, a growing mass of unorganized plant parenchyma cells is called _____.

(b) In binary number system, two digits used in computer are _____ and _____.

(c) The branch of molecular biology concerned with the structure, function, evolution and mapping of genome is called _____.

(d) Full form of GUI used in computer is _____.

(*Turn Over*)

(e) In computer, RAM stands for _____.

(f) In Sanger sequencing method, ddNTP is used for chain _____.

(g) A cell that can give rise to different types of cells, but not the whole organism is called _____.

2. Answer the following in brief : 2×4=8

(a) What do you mean by machine language of a computer?

(b) Distinguish between rooted and unrooted phylogenetic tree.

(c) Distinguish between DNA library and gene library.

(d) Distinguish between vegetative propagation and micropropagation.

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

(a) Graphical data representation in MS-Office Excel

(b) Scope of bioinformatics in plant molecular biology

(c) Crop improvement through tissue culture technique

(d) Application of DNA fingerprinting in plant taxonomy

A7/**700**

(*Continued*)

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

(a) Discuss the developmental history and scope of biotechnology in India. 5+5

(b) What do you mean by somatic embryogenesis? Explain how somatic embryogenesis can be obtained in tissue culture. 3+7

(c) What do you mean by bioengineering? Give an illustration of bioengineering technique. 3+7

(d) Give two examples of biological databases. Explain the usefulness of bioinformatics in biological research citing few examples. 2+8

(e) Classify different types of culture media. Explain the advantages of using MS medium in plant tissue culture. 5+5

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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/Answer the following : 1×7=7

   (a) Who is known as the father of Green Revolution?

   (b) Commercial cocoa is obtained from ——.

   (c) Write the scientific name of the plant from which castor oil is obtained.

   (d) Mention the name of the alkaloid obtained from Catharanthus (Periwinkle).

   (e) Storage tissue of leguminous seed is known as ——.

　　　　　　　　　　　　　　(Turn Over)

(f) Botanical name of the Henna plant is
——.

(g) The fruit of orange is known as ——.

2. Answer the following questions : 2×4=8

(a) What is Ethnobotany?

(b) Mention the commercially used parts and uses of the following plants :

(i) Ginger

(ii) Citronella

(c) What are the various products obtained from rice?

(d) Write about products and uses of (i) jute and (ii) cotton.

3. Answer any *three* of the following questions :
5×3=15

(a) Mention the plant parts used, alkaloids present and uses of the following plants :

(i) *Andrographis*

(ii) *Rauwolfia*

(b) Mention the botanical names of the following plants along with parts used and uses :

(i) Manjistha

(ii) Bixa

(c) What is the centre of origin of crop plants? Write different centres of origin of crop plants as proposed by Vavilov.

(d) Write a note on spice-yielding plants of North-East India.

4. Answer the following questions : 10×3=30

(a) Write notes on the products and uses of the following plants :

(i) Mustard or Groundnut

(ii) Soybean or Pea

(iii) Sugarcane or Sugar beet

(iv) Tea or Coffee

(b) Define Pharmacognosy. How does the knowledge of Pharmacognosy help in the study of uses of medicinal plants?

Or

What is intellectual property right? Giving examples, write in detail how IPR prevents biopiracy of traditionally used plant resources.

2017

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) What is antenna chlorophyll?

   (b) Mention the cause of Gray spec disease.

   (c) Who coined the terms 'apoplast' and 'symplast'?

   (d) Name the intermediate compound of Krebs cycle, which is linked with amino acid synthesis.

   (e) What is the physiologically active form of phytochrome?

(Turn Over)

(2)

(f) What is the driving force of water absorption by plant under normal condition?

(g) What is the precursor of ethylene biosynthesis?

2. Write short notes on the following : 2×4=

 (a) Significance of transpiration

 (b) Alcoholic fermentation

 (c) Chemosynthesis

 (d) Criteria of essentiality of elements

3. Describe any *three* of the following : 5×3=15

 (a) Phloem loading and unloading

 (b) Tracer technique

 (c) Donnan equilibrium

 (d) Salt respiration

 (e) Role of ABA as stress hormone

4. (a) Describe the most widely accepted theory of upward translocation of water in plants. Justify the acceptability of the theory. 6+4=10

(3)

Or

What is water potential? Work out the relationship of various components of water potential with suitable example. 3+7=10

(b) Differentiate between substrate-level phosphorylation and oxidative phosphorylation. Describe the details of electron transport system in mitochondria. 4+6=10

Or

What is photophosphorylation? Describe the environmental factors affecting photosynthesis with the help of law of limiting factors. 3+7=10

(c) Describe the pathway of auxin biosynthesis. Describe the mechanism of auxin action with the help of acid growth hypothesis. 5+5=10

Or

Define photoperiodism and mention the plant types on the basis of critical day length. Describe in brief about the hypothetical flowering hormone. 5+5=10

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