2016

BOTANY

(Major)

Paper : 6.1

(Molecular Biology and Plant Biochemistry)

(Theory)

Full Marks : 60

Time : 3 hours

The figures in the margin indicate full marks for the questions

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

(a) RNA having enzyme activity is called ——.

(b) Nucleotide base that changes from purine to pyrimidine is termed as ——.

(c) Protein synthesis takes place in —— of the cells.

(d) There is a number of sequences which is common to many *E.coli* and bacteriophages genes upstream to starting point of lac operon known as ——.

(e) —— is the most extensively studied alkylating agent both with regard to chemical effects as well as mutagenic effects.

(f) Starch is an example of —— saccharide.

(g) Template DNA that produces 'Okazaki fragments' during replication is called —— strand.

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

(a) Exon

(b) Base transition

(c) Genetic code

(d) Coenzymes

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

(a) Different forms and functions of RNA

(b) Operon concept

(c) Semi-conservative mode of DNA replication

(d) Properties of enzymes

(e) Fine structure of genes

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

(a) Define mutation. Classify different types of mutations citing examples. 2+8=10

(b) Explain the 'central dogma of life'. Why is it important in molecular biology and genetics? 10

(c) Elaborate the process of biological nitrogen fixation. 10

(d) Discuss the 'lac operon' gene expression and regulation in prokaryotes. 10

(e) Discuss in detail about the structure and formation of polysaccharides. Differentiate it from disaccharides. 8+2=10

(f) Write a critical account about the mechanism of enzyme action in plants. 10

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2016

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. Answer the following as directed : 1×7=7

(a) The aspect of bioinformatics that can be applied to drug designing is known as ——.

(Fill in the blank)

(b) What is PHYLIP?

(c) —— is the study of location, structure and function of entire protein content of a cell or a body.

(Fill in the blank)

(d) What does the acronym 'MOUSE' stand for?

(e) Who created the 'Hypertext Markup Language', i.e. HTML?

(f) Who introduced the technique of tissue culture?

(g) What is the MS medium?

2. Write short notes on any *four* of the following : 2×4=8

(a) Restriction Enzymes

(b) Biological Databases

(c) Operating System(OS)

(d) Totipotency

(e) GM Crops

(f) Binary Number System

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

(a) Differentiate between RAM and ROM.

(b) Write the use of genetic engineering in agriculture.

(c) Write briefly about the blast algorithm.

(d) What is SWISS-PROT protein sequence database? How is it used?

(e) Discuss about the applications of a bar-code reader.

(f) Write a note on DNA fingerprinting.

(Continued)

4. (a) What role does bioinformatics play in drug discovery and designing? Discuss. 10

Or

What are input devices? Write about the different input devices of a computer. 2+8=10

(b) Define 'genomics'. Write a note on functional genomics and its component parts dealing with gene and protein expression and metabolism. 1+9=10

Or

Write short notes on the following : 5+5=10

(i) Production of haploid plants by anther and microspore culture

(ii) Somaclonal variation

(c) (i) Discuss about the scope and significance of plant biotechnology. 7

(ii) Write a note on DNA library. 3

Or

"Life without the Internet has become unimaginable." Discuss and justify the statement in the present-day context. 10

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2016

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) Define senescence.

   (b) What is cell sap?

   (c) Which elements are required for photolysis of water?

   (d) What are the components of water potential of plant cell?

   (e) Do you agree that water is the only possible electron donor in photosynthesis?

(f) What are accessory pigments?

(g) Name the enzyme that interconnects the glycolysis with Krebs' cycle.

2. Briefly describe about the following : 2×4=

(a) Significance of photorespiration

(b) Vernalization

(c) Apoplast and Symplast

(d) Symptoms of Zn and Mn deficiency

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

(a) Red Drop and Emerson's enhancement effect

(b) Mass or pressure flow hypothesis of the transport of organic solutes

(c) Difference between trace and tracer elements

(d) Assimilate partitioning

(e) Cytochrome pump

4. (a) What is transpiration? Describe the ATP-driven proton-potassium exchange mechanism in guard cells. "Transpiration is a necessary evil." Justify the statement. 2+6+2=10

(Continued)

Or

What do you mean by non-osmotic water absorption? With the help of suitable examples, explain the mechanism of active transport. 2+8=10

(b) Enumerate the differences between C_3 and C_4 photosynthesis. 10

Or

Explain pentose-phosphate pathway. What is its significance? 7+3=10

(c) What is stress? Give a brief account of water and salt stress in plants. 2+4+4=10

Or

What is phytohormone? How many kinds of them are known to you? Describe the physiological roles of auxin. 2+1+7=10

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2016

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) Commercial tea is obtained from the plant called _____.

(b) Write the scientific name of the plant from which 'rubber' is obtained.

(c) Name the person who helped in popularization of sugar beet.

(d) The centre of origin of *Azadirachta* is _____.

(e) Storage tissue in cereal grains is known as _____.

(f) The groundnut kernels are rich in _____.

(g) The aerial portion of banana is a _____.

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

(a) Write about the commercial products of pararubber.

(b) Mention the following commercially used parts of plant :

(i) Citronella

(ii) Turmeric

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

(d) Define non-timber plant resources.

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

(a) Mention the botanical names of the plants, parts used and various uses of—

(i) black pepper;

(ii) clove.

(b) Write a note on IPR.

(c) Elucidate the importance of crop domestication.

(Continued)

(d) Write a note on the by-products of sugar industry.

(e) How does pharmacognosy help in studying medicinal plants?

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

(a) What do you mean by 'Green Revolution'? Write a note on the contribution of Dr. M. S. Swaminathan on it.

(b) Write notes on the products obtained and their uses of the following plants :

(i) Sugar beet

(ii) *Taxus* sp

(iii) *Holarrhena* sp

(iv) *Bixa* sp

(c) What are timber plant resources? Write a note on timber plant resources of North-East India.

(d) What is ethnobotany? Note down the different sub-disciplines of it. Write a brief note on the development of ethnobotany in India.

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