2022

(CBCS)

(5th Semester)

BOTANY

SEVENTH PAPER

(Cytogenetics, Plant Breeding and Bioinformatics)

Full Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

(SECTION : A—OBJECTIVE)

(*Marks* : 10)

Tick (✓) the correct answer in the brackets provided : 1×10=10

1. An inversion where the inverted segment does not include the centromere is

(a) pericentric inversion ( )

(b) metacentric inversion ( )

(c) paracentric inversion ( )

(d) reciprocal translocation ( )

2. When the centromere is situated exactly at one end, the chromosome will be having only one long arm, it is called

(a) sub-metacentric ( )

(b) telocentric ( )

(c) acrocentric ( )

(d) metacentric ( )

3. The change in chromosome number which involves one or few chromosome(s) of the genome is called

(a) euploidy ( )

(b) polyploidy ( )

(c) amphiploidy ( )

(d) aneuploidy ( )

4. When there is addition of one chromosome in two different pairs (2*n* 1 1), it is called

(a) simple trisomics ( )

(b) secondary trisomics ( )

(c) double trisomics ( )

(d) tertiary trisomics ( )

5. A diagrammatic, graphical representation of relative distances between linked genes of a chromosome, is called

(a) ideogram ( )

(b) karyotype ( )

(c) karyogram ( )

(d) linkage map ( )

6. A pattern of inheritance where a single phenotypic trait is governed by more than one pair of genes is

(a) extra-nuclear inheritance ( )

(b) self-sterility ( )

(c) qualitative inheritance ( )

(d) quantitative inheritance ( )

7. The three codons which result in the termination of polypeptide chain synthesis are

(a) UAA, UAG, GUA ( )

(b) UAG, UAA, UGA ( )

(c) UAA, UGA, UUA ( )

(d) UGU, UAG, UGA ( )

8. The process involving inspection, fumigation and growing the introduced plant material in isolation is known as

(a) quarantine ( )

(b) acclimatization ( )

(c) adaptation ( )

(d) All of the above ( )

9. GenBank is a nucleic acid database maintained by

(a) National Center for Biotechnology Information (NCBI) ( )

(b) DNA Data Bank of Japan (DDBJ) ( )

(c) European Molecular Biology Laboratory (EMBL) ( )

(d) European Bioinformatics Institute (EBI) ( )

10. The term 'bioinformatics' was coined by

(a) Frederick Sanger ( )

(b) Paulien Hogeweg ( )

(c) Margaret Dayhoff ( )

(d) J. D. Watson ( )

(SECTION : B—SHORT ANSWER)

(*Marks* : 15)

Write short notes on the following : 3×5=15

UNIT—I

1. Functions of chromosome

OR

2. Consequences of duplication

UNIT—II

3. Aneuploidy

OR

4. Polyploidy in plant breeding

UNIT—III

5. Karyotype

OR

6. Cytoplasmic male sterility

UNIT—IV

7. Physical mutagens

OR

8. Heterosis

UNIT—V

9. BLAST

OR

10. Bytes

(SECTION : C—DESCRIPTIVE)

(*Marks* : 50)

Answer the following questions : 10×5=50

UNIT—I

1. What is cytoskeleton? Elucidate the components and functions of a cytoskeleton. 2+8=10

OR

2. Write accounts of the following : 5+5=10

(a) Deletion and its consequences

(b) Chemical composition of chromosome

UNIT—II

3. What are numerical changes in chromosome? Give an account on sources and consequences of chromosomal anomalies. 2+8=10

OR

4. Write accounts of the following : 5+5=10

(a) Trisomy

(b) Segmental allopolyploidy

UNIT—III

5. What is mapping of chromosomes? Describe an account of physical and genetic maps. 2+8=10

OR

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

(a) Multiple allelism

(b) Kappa particles in *Paramecium*

UNIT—IV

7. What is mutation? Describe the types and molecular basis of mutation. 2+8=10

OR

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

(a) Hybrid vigour

(b) Chemical mutagens

UNIT—V

9. What is bioinformatics? Give a basic concept about data and information. 2+8=10

OR

10. Write accounts of the following : 5+5=10

(a) DNA sequence alignment

(b) Search tools

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