

Bs/BCC M4

2025

(FYUGP)

(4th Semester)

BOTANY

(MINOR)

Paper : BCC M4

(Genetics)

Full Marks : 75

Pass Marks : 40%

Time : 3 hours

(PART : B—DESCRIPTIVE)

(Marks : 50)

The figures in the margin indicate full marks for the questions

1. Discuss Mendel's law of inheritance. 10

OR

2. Write on the following : 5+5=10

(a) Chromosome theory of inheritance

(b) Sex chromosomes

(Turn Over)

L25/422a

3. What is extrachromosomal inheritance?
Describe cytoplasmic inheritance in four
O'clock plant. 2+8=10

OR

4. Write on the following : 5+5=10
- (a) Maternal effect shell coiling in snail
- (b) Mitochondrial mutation in yeast

5. Explain the mechanism and significance of
crossing-over. 10

OR

6. Comment on the following : 5+5=10
- (a) Interference
- (b) Sex linkage

7. What is mutation? Describe the different
types of point mutation. 2+8=10

OR

8. Explain the key difference between classical
and molecular concepts of gene. 10

(3)

9. Discuss in detail Hardy-Weinberg law.

10

OR

10. Write notes on the following :

5+5=10

(a) Genetic drift

(b) Speciation

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BOTANY

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(PART : A—OBJECTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

SECTION—I

(Marks : 15)

Put a Tick (✓) mark against the correct answer in the brackets provided : $1 \times 15 = 15$

1. Who is known as the father of genetics?

(a) Mendel ()

(b) Morgan ()

(c) Bateson ()

(d) Watson ()

2. HOmozygosity and heterozygosity of an individual can be determined by

- (a) testcross ()
- (b) backcross ()
- (c) self-fertilization ()
- (d) All of the above ()

3. An exception to Mendel's law is

- (a) linkage ()
- (b) independent assortment ()
- (c) purity of gametes ()
- (d) dominance ()

4. Epistasis is the interaction between genes.

- (a) 4 ()
- (b) 2 ()
- (c) 8 ()
- (d) 16 ()

5. When two or more non-allelic gene pairs affect the same character in the same way, it is called

- (a) pleiotropy ()
- (b) polygenic inheritance ()
- (c) additive expressivity ()
- (d) penetrance ()

6. Crossing-over takes place in the

- (a) diakinesis stage ()
- (b) anaphase stage ()
- (c) pachytene stage ()
- (d) leptotene stage ()

7. Linkage in *Drosophila* was first discovered by

- (a) Morgan ()
- (b) Bateson and Punnett ()
- (c) Mendel ()
- (d) Bridges ()

8. The unit of linkage map is

- (a) morgan ()
- (b) centimorgan ()
- (c) centimetre ()
- (d) angstrom ()

9. Damage and errors in DNA cause

- (a) mutation ()
- (b) DNA repair ()
- (c) translation ()
- (d) transcription ()

10. Base analog can affect DNA

- (a) replication ()
- (b) transcription ()
- (c) Both (a) and (b) ()
- (d) translation ()

11. A mutation that stops the production of a protein is

(a) non-sense mutation ()

(b) missense mutation ()

(c) silent mutation ()

(d) frameshift mutation ()

12. 5-Bromouracil is an example of

(a) biological mutagens ()

(b) physical mutagens ()

(c) chemical mutagens ()

(d) None of the above ()

13. The total sum of all the frequencies of the allele is

(a) one ()

(b) two ()

(c) three ()

(d) four ()

14. How many factors affect the Hardy-Weinberg principle?

(a) Six ()

(b) Four ()

(c) Seven ()

(d) Five ()

15. The process of formation of one or more new species from an existing species is called

(a) saltation ()

(b) mutation ()

(c) speciation ()

(d) radiation ()

(7)

SECTION—II

(Marks : 10)

Answer/Write short notes on any *five* of the following :
 $2 \times 5 = 10$

1. Pedigree analysis

(8)

2. Multiple alleles

SECTION-II

(Marks : 10)

Answer/Write short notes on any five of the following :
2x5=10

1. Pedigree analysis

(9)

3. Kappa particles in Paramecium

(10)

4. Characters of extrachromosomal inheritance

5. What is two-factor cross?

6. Chromosome aberration

5. What is two-factor cross?

7. What are physical mutagens?

★ ★ ★