**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

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





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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**Subject Code : Bs/BCC M4**

**Booklet No. A** 142

Date Stamp .....

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**To be filled in by the Candidate**

BA / BSc / BCom / BBA / BCA 4th Semester End Term Examination, **2025 (FYUGP)**

Subject .....

Paper .....

**INSTRUCTIONS TO CANDIDATES**

1. **The Booklet No. of this script should be quoted in the answer script meant for descriptive type questions and vice versa.**
2. **This paper should be ANSWERED FIRST and submitted within 1 (one) Hour of the commencement of the Examination.**
3. **While answering the questions of this booklet, any cutting, erasing, over-writing or furnishing more than one answer is prohibited. Any rough work, if required, should be done only on the main Answer Book. Instructions given in each question should be followed for answering that question only.**

**To be filled in by the Candidate**

BA / BSc / BCom / BBA / BCA 4th Semester End Term Examination, **2025 (FYUGP)**

Roll No. .....

Regn. No. .....

Subject .....

Paper .....

DESCRIPTIVE TYPE

Booklet No. B .....

*Signature of Scrutiniser(s)*

*Signature of Examiner(s)*

*Signature of Invigilator(s)*

**/422**

**2025**

( FYUGP )

( 4th Semester )

**BOTANY**

( MINOR )

Paper : BCC M4

**( Genetics )**

( 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 : 1×15=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 ( )

## SECTION—II

( *Marks* : 10 )

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

**1.** Pedigree analysis

2. Multiple alleles

3. Kappa particles in Paramecium

**4.** Characters of extrachromosomal inheritance

**5.** What is two-factor cross?

**6.** Chromosome aberration

**7.** What are physical mutagens?

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