

**M.Sc. BOTANY**  
**SECOND SEMESTER**  
**GENETICS AND PLANT BREEDING**  
**MSB-203**

**SET**  
**C**

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 1hr. 30 mins.

Full Marks: 35

Time: 15 mins.

**(Objective)**

Marks: 10

*Choose the correct answer from the following:*

**1×10=10**

- Breeding for disease resistance requires:
  - A good source of resistance
  - Planned hybridization
  - Disease test
  - All of these
- Undesirable linkage can be broken by:
  - Pedigree method
  - Bulk method
  - Backcross method
  - All of these
- Heterosis is:
  - Appearance of spontaneous mutations
  - Induction of mutations
  - Mixture of two or more traits
  - Superiority of hybrids over their parents
- The new varieties of plants are produced by:
  - Introduction and mutation
  - Selection and hybridization
  - Mutation and selection
  - Selection and introduction
- Pureline breed refers to:
  - Heterozygosity only
  - Homozygosity only
  - Homozygosity and self-assortment
  - Heterozygosity and linkage
- Which of the following ratio shows complementary gene interaction?
  - 9:7
  - 12:8
  - 9:3:3:1
  - 9:6
- Which of the following does not show Mendel's law of inheritance?
  - Masking gene interaction
  - Epistasis
  - Supplementary gene interaction
  - Codominance
- Colchicine is used to cause.....
  - Mitotic non-disjunction
  - Meiotic non-disjunction
  - Mitotic disjunction
  - Meiotic disjunction
- What is the substitution of a purine base with a pyrimidine base known as?
  - Deletion
  - Transition
  - Addition
  - Transversion

10. Which one of the following characters of garden pea was not chosen by Mendel for his experiments?
- a. Flower colour
  - b. Seed colour
  - c. Flower shape
  - d. Seed shape

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**( Descriptive )**

Time : 1 hr. 15 mins.

Marks : 25

[ Answer question no.1 & any two (2) from the rest ]

1. Describe the procedure for dominant backcross gene transfer. 5
2. What is gene interaction? Explain epistasis and complementary genes with Punnett diagrams. 2+4+4=10
3. What is extra nuclear inheritance? Explain extra nuclear inheritance of *kappa* particles in *Paramecium* with significant drawings. 3+7=10
4. Write short notes on: 5+5=10
  - a) Hybrid varieties
  - b) Synthetic varieties
5. Briefly describe the modified Ear to Row method for crop improvement. 10

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