

M.Sc. BOTANY
SEMESTER III EXAMINATION 2023
PAPER CODE: MBO-DCE302
PAPER TITLE: PLANT BREEDING

Time: Three Hours

Maximum Marks: 75

(Write your Roll No. at the top immediately on receipt of this paper)

Attempt ALL questions. All parts of a question must be attempted in continuation. Start answering each question on a new page. Cite examples and draw labelled diagrams wherever necessary.

Q1. Attempt all sections given below:

[A] Attempt all MCQs **(1×5=5)**

1. The quickest method of plant breeding is
 - a) Introduction
 - b) Mutation breeding
 - c) Hybridization
 - d) Selection
2. Jagannath is a mutant variety of
 - (a) Wheat
 - (b) Maize
 - (c) Rice
 - (d) Barley
3. Condition of karyotype $2n-1$, $2n+1$, $2n-2$, $2n+2$ are
 - (a) Aneuploidy
 - (b) Polyploidy
 - (c) Monosomy
 - (d) Euploidy
4. Molecular markers can be used to study the level, structure, and origin of
 - a) Genetic variation
 - (b) Morphology
 - (c) Physiology
 - (d) None of the above
5. A phenomenon that progeny of diverse varieties of a species or crosses between species exhibit greater biomass, speed of development, and fertility than both parents.
 - (a) Molecular plant breeding
 - (b) Heterosis
 - (c) Mutation
 - (d) None of the above

[B] Differentiate between **(1×5=5)**

- (i) Classical plant breeding and molecular plant breeding.
- (ii) Inter and intra specific hybridization.
- (iii) Aneuploidy and euploidy.
- (iv) Primary introduction and secondary introduction.
- (v) Functional genomics and structural genomics.

P.T.O.

[C] Write full name

(1×5=5)

(i) MAS (ii) QTL (iii) AFLP (iv) IRRI (v) ICAR

Q2. Discuss the different selection methods adapted for self-pollinated crops. Illustrate with a proper presentation in each method. **(15)**

OR

Write short notes on

(3×5=15)

- (i) Mutation
- (ii) Hybridization
- (iii) Agencies of introduction

Q3. Write short notes on

(3×5=15)

- (i) Karyotype evolution
- (ii) Molecular organization of centromere
- (iii) Banding pattern

OR

How will you distinguish Monoploidy from Haploidy? Write about the origin, morphology and uses of haploids. **(15)**

Q4. Describe heterosis, its types and theories. What are the advantages and future prospect of heterosis?

OR

Write short notes on

(3×5=15)

- i) Induced autopolyploid
- ii) Synthesized allopolyploids
- iii) Polyploidy based breeding

Q5. Mention key criteria to become an ideal marker. Highlight the importance of molecular markers in plant breeding. **15**

OR

Define genomics and explain functional genomics approaches based methodologies. Mention how genomics approach can be used to improve crops under stress conditions. **15**
