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H-6644

M.Sc. (Semester-IV) Examination, July 2022

BOTANY

**(Advanced Genetics
and Plant Breeding)**

Time Allowed : Three Hours

Maximum Marks : 70

Minimum Passing Marks : 25

Note : Question paper is divided into **four** sections. Attempt questions of all four sections as per direction. Distribution of marks is given in each section.

SECTION-A

(Objective Type Questions)

1. Attempt **any ten** questions. Each question carries **1** mark.

[10×1=10]

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(1)

[P.T.O.]

- (i) _____ has the maximum genetic diversity in India.
- (ii) India has _____ biogeographic zones.
- (iii) Extinction _____ occurs when the death of the last individual in a species occurs.
- (iv) Somaclonal variation is common in :
 - (a) Plant tissue culture
 - (b) Mutation
 - (c) Hybridization
 - (d) None of the above
- (v) RAPD is a :
 - (a) DNA sequencing based method
 - (b) Restriction digestion based method
 - (c) PCR based method
 - (d) All of the above

- (vi) QTL is the chromosomal site at which a group of genes affecting quantitative traits is located :
- (a) True
 - (b) False
- (vii) Which of the following step is the main root of any plant breeding programme?
- (a) Genetic variability
 - (b) Evaluation and selection of parents
 - (c) Cross hybridisation among the selected parents
 - (d) Selection and testing of superior recombinants
- (viii) Traits which show continuous variation is referred as :
- (a) Genetic disorders
 - (b) Phenotypic variation
 - (c) Quantitative traits
 - (d) Qualitative traits

- (ix) Why does genetic diversity have a major role in the adaptability and survival of a species?
- (a) Any population should remain the same regardless of the outer change in the environment
 - (b) Ability of population to adapt to changing environment
 - (c) Environment remains unchanged even if the population changes
 - (d) Population inability to adapt to changing environment
- (x) The tendency of an offspring to resemble its parent is known as :
- (a) Variation
 - (b) Heredity
 - (c) Resemblance
 - (d) Inheritance

(xi) When the activity of one gene is suppressed by the activity of a non-allelic gene, it is known as :

- (a) Pseudo-dominance
- (b) Hypostasis
- (c) Epistasis
- (d) Incomplete dominance

(xii) _____ is a type of trait whose phenotype is influenced by more than one gene.

- (a) Oncogenic trait
- (b) Monogenic trait
- (c) Polygenic trait
- (d) None of the above

SECTION-B

(Very Short Answer Type Questions)

Note: Attempt **any five** questions. Each question carries **2** marks. (word limit **25-30** words) [5×2=10]

2. (i) Define polygenetic inheritance.
- (ii) Define Line Breeding.
- (iii) What is Gene Pool ?
- (iv) What is Polyploidy ?
- (v) Define Proteomics.
- (vi) What are Dominant Markers?
- (vii) Where do germline mutations occur?

SECTION-C

(Short Answer Type Questions)

Note: Attempt **any five** questions. Each question carries **4** marks. (word limit **250** words) [5×4=20]

3. (i) Explain kinds and patterns of variation.
- (ii) What are some examples of quantitative traits?
- (iii) What is meant by manipulation of gene?
- (iv) Explain what are the issues related to access and use of genetic resources.

- (v) Explain agro-biodiversity in detail.
- (vi) Explain map based cloning.
- (vii) Explain what are the 3 types of IPR.

SECTION-D

(Essay Type Questions)

Note: Attempt **any three** questions. Each question carries **10** marks. (word limit more than **500** words) [3×10=30]

4. (i) Explain method and application of gene pyramiding in detail.
- (ii) What are molecular markers? Explain its role in tagging of agronomically important traits.
- (iii) Explain selection and breeding strategies for self pollinated crops in detail.
- (iv) What are functional genomics techniques? Explain.

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