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BRAINWARE UNIVERSITY

Term End Examination 2025-2026

Programme – B.Sc.(Ag)-Hons-2024

Course Name – Commercial Plant Breeding

Course Code - EC-BAG471-C(T)

(Semester IV)

Full Marks : 50

Time : 2:0 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 20=20

1. Choose the correct alternative from the following :

- (i) Identify the number of center of origin proposed by Vavilov initially.
 - a) 8
 - b) 9
 - c) 10
 - d) 11
- (ii) Infer what does self pollination in a population increase.
 - a) Homozygosity
 - b) Heterozygosity
 - c) Homogeneity
 - d) Heterogeneity
- (iii) Identify the generation where Heterosis is often observed.
 - a) F1
 - b) F2
 - c) F3
 - d) P
- (iv) Identify the method for the cross between inbred and open pollinated variety.
 - a) Single cross
 - b) Top cross
 - c) Polycross
 - d) Multiple cross
- (v) Infer the difference between population mean and mean of selected plants.
 - a) Genetics gain
 - b) Heritability
 - c) Selection differential
 - d) Response to selection
- (vi) Identify from which generation onwards, selection can be practised.
 - a) F1
 - b) F2
 - c) F3
 - d) F4
- (vii) Choose the maximum proportion of heterozygosity in a population from the following option.
 - a) 0.25
 - b) 0.5
 - c) 0.75
 - d) 1
- (viii) Identify from the following the breeding method which utilises the existing genetic variability of a population.

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| a) Mass Selection
c) Bulk Method
(ix) Identify the fixable component of genetic variance.
a) Dominance Genetic variance
c) Epistatic genetic variance
(x) Identify the measure of Specific Combining Ability.
a) Dominance Genetic variance
c) Epistatic genetic variance
(xi) Infer, In cross pollinated species which of the following breeding methods should be used if there is preponderance of specific combining ability.
a) Synthetic breeding
c) Heterosis breeding
(xii) Show the breeding method which utilises both GCA and SCA.
a) Simple recurrent selection
c) Recurrent selection for SCA
(xiii) Identify the breeding method where combining ability is measured.
a) Hybrids
c) Synthetics
(xiv) Identify the term used for the ratio between additive variance and phenotypic variance.
a) Narrow sense heritability
c) Genetic advance
(xv) Identify the methods of fixing heterosis.
a) Asexual reproduction
c) poluploidy
(xvi) Identify the term reffered to the selfed progeny of a cross pollinated crop.
a) Inbred
c) Cybrids
(xvii) Identify the name of the parent from which a character is transferred to a popular variety.
a) Donor parent
c) Maternal parent
(xviii) Infer the difference between the lowest and the highest value in a sample.
a) Range
c) Kurtosis
(xix) Identify the source of Dwarfing Genes in Wheat.
a) Dee-geo-woo-gen
c) Norin 10
(xx) Relate the other name of Microsatellite Repeats.
a) RFLP
c) AFLP | b) Pedigree Method
d) Single seed decent method
b) Additive Genetic Variance
d) Dominace X Dominance variance
b) Additive Genetic Variance
d) Dominace X Dominance variance
b) Composite breeding
d) Pedigree breeding
b) Recurrent selection for GCA
d) Reciprocal Recurrent Selection
b) Pureline
d) Composites
b) Broad sense heritability
d) None of these
b) Apomixis
d) All of these
b) Hybrid
d) Open pollinated varieties
b) Receipient parent
d) none of these
b) Skewness
d) Median
b) Tift 23 A
d) Pseudogenes
b) SSR
d) SNP |
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Group-B

(Short Answer Type Questions)

2.5 x
10=25

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| 2. Summarize domestication of crops. | (2.5) |
| 3. Identify the A line, B line and R line in three line breeding system. | (2.5) |
| 4. Formulate the major difference in breeding approach for self pollinated crops and cross pollinated crops. | (2.5) |
| 5. Identify the components of Genetic variance. | (2.5) |
| 6. Formulate the different kinds of mutagens. | (2.5) |

7. Compare between top cross and double top cross hybrids. (2.5)
8. Explain Heterosis. (2.5)
9. Explain domestication of crops. (2.5)
10. Design a brief molecular approach for assessing genetic diversity in a local germplasm collection using any two marker systems. (2.5)
11. Explain the theories related to heterosis. (2.5)

OR

Explain the breeding method which requires maximum expertise of the breeder. (2.5)

Group-C

(Long Answer Type Questions)

5 x 1=5

12. Justify the statement maximum heterozygote frequency in a population can never exceed 0.5. (5)

OR

Assess the terms Response to Selection and Selection Differential. (5)
