



BRAINWARE UNIVERSITY

Term End Examination 2023-2024

Programme – B.Sc.(Ag)-Hons-2021

Course Name – Fundamentals of Plant Breeding

Course Code - CC-BAG372(T)

(Semester III)

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Brainware University
Barasat, Kolkata -700125

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 method for the cross between inbred and open pollinated variety
- | | |
|-----------------|--------------|
| a) Single cross | b) Polycross |
| c) Multicross | d) Topcross |
- (ii) Identify which of the following represents the centre most point of a data set
- | | |
|---------|-----------|
| a) Mean | b) Median |
| c) Mode | d) Range |
- (iii) Identify which compound causes lathyrism
- | | |
|------------|------------------|
| a) BOAA | b) Erucic acid |
| c) Saponin | d) none of these |
- (iv) The ability of an inbred line to transmit its average performance to its hybrid progeny is termed
- | | |
|------------------------------|-------------------------------|
| a) General combining ability | b) Specific combining ability |
| c) Combining ability | d) Heritability |
- (v) Relate the crop associated with detasseling
- | | |
|----------|------------|
| a) Rice | b) Wheat |
| c) Maize | d) Sorghum |
- (vi) Infer who proposed mega gene centre
- | | |
|------------|--------------|
| a) Harlan | b) Zukovasky |
| c) Vavilov | d) Went |
- (vii) Infer the name of the flower where pollen is set in closed flower
- | | |
|------------------|-----------------|
| a) Cleistogamous | b) Chasmogamous |
| c) Protandrous | d) Protogynous |
- (viii) Identify the modified stem of potato
- | | |
|-----------|----------|
| a) Sucker | b) Tuber |
| c) Bulb | d) Corm |
- (ix) Show the genetic constitution of the source population for Pureline Selection

- a) Homogeneous autogamous
c) Heterogeneous autogamous
- b) Heterogeneous allogamous
d) Homogeneous allogamous
- (x) Identify the generation where Heterosis is often observed
- a) F1
c) F3
- b) F2
d) P
- (xi) Explain the basis of heterosis according to the dominance hypothesis
- a) Masking of expression of deleterious recessive alleles
c) Epistatic interactions among different alleles
- b) The cumulative effects of multiple gene loci
d) The presence of recessive alleles in the hybrid offspring
- (xii) Infer what Heterobeltiosis is also known as
- a) Standard heterosis
c) Commercial heterosis
- b) Better parent heterosis
d) luxuriance
- (xiii) Explain the reason of bagging in plant breeding
- a) Avoid self pollination
c) Prevent contamination from foreign pollen
- b) Avoid cross pollination
d) Both the reason Avoid cross pollination and Prevent contamination from foreign pollen
- (xiv) Explain the process for hardening a plant to changed climate?
- a) Acclimatisation
c) Introduction
- b) Adaptation
d) Domestication
- (xv) Infer what domestication leads to
- a) decrease in fitness
c) Domestication is not related with fitness
- b) increase in fitness
d) Increase diversity
- (xvi) Choose the maximum proportion of heterozygosity in a population
- a) 0.25
c) 0.75
- b) 0.5
d) 1
- (xvii) Identify the measure of Specific Combining Ability
- a) Dominance Genetic variance
c) Epistatic genetic variance
- b) Additive Genetic Variance
d) Dominance X Dominance variance
- (xviii) Infer which of the following is correct in Pureline Selection
- a) Inbreeding is high and selection intensity is low
c) Both inbreeding and selection intensity are high
- b) Inbreeding is low and selection intensity is high
d) Both inbreeding and selection intensity is low
- (xix) Infer which of the following Tests are used to Measure the GCA of Selected Clones or Populations
- a) Polycross Test
c) Open-pollinated Progeny Test
- b) Topcross Test
d) All of these
- (xx) Explain Self-pollinated crops increases what
- a) Homozygosity
c) Heterozygosity
- b) Homogeneity
d) Heterogeneity

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Group-B

(Short Answer Type Questions)

2.5 x
10=25

2. Explain the utility of multiline towards durable resistance. (2.5)
3. Interpret Semigamy. (2.5)
4. Explain domestication of crops (2.5)
5. Explain CGMS (2.5)
6. Deduce population improvement stepwise. (2.5)
7. Infer the relevance of self incompatibility and male sterility in plant breeding (2.5)

8. Show the regional sub-stations under NBPGR (2.5)
9. Infer the terms Geitonogamy and Xenogamy. (2.5)
10. Formulate a breeding method which utilises both SCA and GCA (2.5)
11. Interpret Apogamy (2.5)

OR

Interpret the role of apomixes (2.5)

Group-C

(Long Answer Type Questions)

5 x 1=5

12. Estimate the importance of genetic diversity in breeding for abiotic and biotic stress tolerance. (5)

OR

Justify the statement Plant breeding is a science and a art. (5)

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