



Registration No:
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B.Sc (Ag)

3rd SEMESTER REGULAR EXAMINATIONS, SEPT/OCT 2019-20

PB-232

FUNDAMENTALS OF PLANT BREEDING

Time : 2 Hours

Maximum : 50 Marks

(Answer **all** questions of Section – A)

SECTION – A

1. Multiple choice (choose the most correct answer) [10 x 0.5=5]
- i. Which of these definitions of heritability is most correct ?
 - a. The total amount of phenotypic variation in a population
 - b. The proportion of phenotypic variation in a population that is due to genetic factors
 - c. The total amount of genetic variation in a population
 - d. The proportion of phenotypic variation in a population that is due to environmental factors.
 - ii. Which Parent is used only once in back cross breeding method
 - a. Recurrent
 - b. Female
 - c. Male
 - d. Donor
 - iii. Among plants, fertile individuals may arise from sterile ones by
 - a. Haploidy
 - b. Statiploidy
 - c. Diploidy
 - d. Polyploidy
 - iv. The main attributes of selection to understand breeding principle is
 - a. Selection acts on heritable difference
 - b. Selection operates on existing variation
 - c. Both (a) and (b)
 - d. None of the above
 - v. Single seed descent method was originally suggested in 1939 by
 - a. Goulden
 - b. Brim
 - c. Briggs
 - d. Harlan
 - vi. In the bulk method, the bulk populations are
 - a. space planted
 - b. densely planted
 - c. planted at commercial rates
 - d. grown in off-season nurseries
 - vii. In which method of crop breeding precise relationship of all the plants in segregating generations are established
 - a. Bulk method
 - b. pedigree method
 - c. Back cross method
 - d. Mass selection



- viii. In the backcrossing programme , the character under transfer should have
 - a. Low heritability governed by few genes
 - b. high heritability governed by many genes
 - c. moderate heritability governed by any genes
 - d. all of the above
- ix. Genetic self-incompatibility tends to increase
 - a. pollen dispersal
 - b. inbreeding
 - c. pollination
 - d. outcrossing
- x. Genetic variation within clones is attributed to
 - a. Segregation and recombination
 - b. mechanical mixture
 - c. somatic mutation
 - d. All of these

2. Fill in the blanks:

[10 x 0.5=5]

- a) The transfer of pollen grain from the anther to stigma of a flower is known as _____.
- b) Pureline theory was suggested by _____.
- c) The progeny from hybridization between two purelines is called_____.
- d) _____ is a form of apomixis in which the embryo sac develops from the megaspore.
- e) The first artificial hybrid was produced by _____.
- f) The condition of the flower that promotes complete self pollination is known as _____.
- g) First opening of flower is known as _____.
- h) Protogyny promotes _____ pollination in crops.
- i) Loss in vigour due to Inbreeding is known as_____.
- j) The hybrid seed harvested from both male and female parent using _____.

3. Differentiate between:

[5 x1=5]

- a. Mass selection and bulk method
- b. Pedigree and single seed descent
- c. Autogamy and geitonogamy
- d. Dicliny and monoecious
- e. Male sterility and self incompatibility

4. Write short notes on the following:

[5 x1=5]

- a. IPR and its objectives
- b. Hardy-Wienberg law
- c. Participatory plant breeding
- d. Multiline
- e. Centre of Origin

SECTION – B

(Attempt any **five** questions. Each question carries equal marks)

5x6=30

- 5. Explain Johanssen’s pureline theory and procedure for pureline method of crop improvement.
- 6. What is backcross? Explain in detail the transfer of recessive character in backcross breeding.
- 7. Define apomixis. Explain different types of apomixes and their uses in crop improvement.
- 8. Define inbreeding depression and write down different types of inbreeding depression.
- 9. What is self incompatibility? Explain heteromorphic system of self incompatibility.
- 10. What are the criteria for an invention to be patented in India?