B.Sc. (Honours) Agriculture Semester-III Examination, 2018
Course No: GPB-211 (Fundamentals of Plant Breeding)

Signature of Centre Superintendent

Roll No. : (in figure) _____ (in words) _____

Student Index No. _____ Regn. No. _____ of _____

Time : Two Hours **Full marks : 50**

Questions are of value as indicated in the margin

Part - I
(Objective and Short Answer Type)
(Use only ball point pen)

Time : 30 minutes **Full marks : 20**

Note: 1. Answer in question paper itself.
2. Striking, rewriting or overwriting are not allowed in the objective type questions.

1. **State True (T) or False (F) in respect the following statements :** 0.5×16=8.0

(i) Self pollinated species do not show inbreeding depression. ☐
(ii) Maturing of anther before pistil is known as protogyny. ☐
(iii) Clonally propagated crops are highly heterozygous in nature. ☐
(iv) IR 8 and IR 36, two rice varieties are good examples of secondary introduction. ☐
(v) Dr. M.S. swaminathan was a wheat breeder. ☐
(vi) In back cross breeding, the parent which donates the desirable character is known as recurrent parent ☐
(vii) The basic chromosome number of wheat is x = 21. ☐
(viii) Differential reproduction rates of different genotypes in a population is known as selection ☐
(ix) Selfing reduces heterozygosity in each generation by the factor ¼ ☐
(x) In pedigree method of breeding selection of individual plants are practised from F_1 generation. ☐
(xi) In asexually propagated crops mutants are expressed in the form of chimeras. ☐
(xii) In reciprocal recurrent selection, both SCA and GCA are used for the improvement of a population ☐
(xiii) In recurrent selection for GCA, homozygous tester is used for improvement of population. ☐
(xiv) Bulk method of breeding was developed by Nilsson and Ehle. ☐
(xv) Pure line selection can be applied for the improvement of local varieties. ☐
(xvi) Blast is a devastating disease in wheat. ☐

2. **Fill up the blanks with most appropriate words:** 0.5×16=8.0

(i) A crop showing less than 5% out-crossing is called _____.

(ii) When sexual reproduction also occurs along with apomixes is called _____.

(iii) _____ is used for artificial induction of polyploids.

(iv) When heterosis is estimated over better parent is known as_____.

(v) If 8 numbers of inbreds are available, the number of possible double crosses will be_____.

(vi) Mutation are generally _____ to organism.

(vii) The phenotypic differences within the pureline is mainly due to _____.

(viii) Flowers having short style and long stamens is called _____

(ix) _____ is an example of allohexaploid.

(x) If 6 number of inbreds are available, the number of possible single crosses will be_____

(xi) An introduced material, a faster multiplication of those genotypes that are better adapted to new environment leads to_____

(xii) Pollen along with pollen tube and three haploid nuclei is called _____

(xiii) In sporophytic self incompatibility, the stigma is papillate and _____.

(xiv) Flowers have long style and short stamens is called _____.

(xv) A well known variety used for the comparing the performance of newly developed strains is called _____.

(xvi)_____ practised individual plant selection in sugarcane to improve sugar content.

3. Match the followings : 0.5×8=4.0

Column A		**Column B**	
a.	Erucic acid	( )	Date Palm
b.	Norin 10	( )	Banana
c.	Autopolyploid	( )	Maize
d.	BOAA	( )	Rice
e.	Monoecious	( )	Lathyrus
f.	Dioecious	( )	Perlmillet
g.	Dee-geo-woo-gen	( )	Wheat
h.	Tift 23A	( )	*Brassica sp*.

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Semester-III
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Part - II
(Descriptive Type)

Time : 90 Minutes **Full marks : 30**

Questions are of value as indicated in the margin

Answer *any three* questions

4. What is self incompatibility and male sterility? Discuss details about saprophytic self incompatibility with suitable diagram and different pollen-style interaction. How can genetic male sterility be utilized in hybrid seed production? Explain. 2+5+3=10

5. What is heterosis and how does it differ from luxuriance? Discuss dominance theory for explanation of heterosis with its objections. How can heterosis be fixed? Explain.2+6+2=10

6. Explain bulk method of breeding with suitable schematic diagram. What are the advantages of bulk method? Why bulk method of breeding is called evolutionary method of breeding?

6+2.5+1.5=10

7. Differentiate between (**any four**) : 2.5×4=10
   i) Back Cross vs Test Cross
   ii) Monoploid vs Haploid
   iii) Composite variety vs Synthetic variety
   iv) Centre of origin vs Centre of diversity
   v) Pureline selection vs mass selection
   vi) Horizental vs veritical resistance
   vii) Heterosis vs intreeding depression

8. Write short notes on (**any five**) : 2×5=10
   a)Heretability
   b) Gene pyramiding
   c) Molecular marker
   d) Prebreeding
   e) Apospory
   f) Indred
   g) Hardy Weingberg Law
   h) LD_{50}
   i) Plant Introduction
