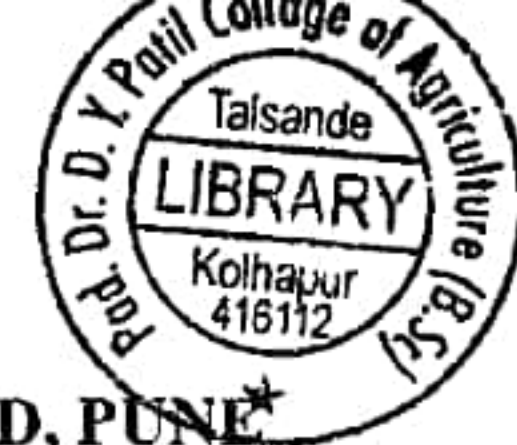


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## MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE SEMESTER END EXAMINATION

B.Sc. (Agri.)

Semester : IV (New)	Term : II	Academic Year : 2010-11
Course No. : BOT 245	Title : Breeding of Field and Horticultural Crops	
Credits : 3 (2+1)		
Day & Date : Wednesday, 27.04.2011	Time : 14.00 to 17.00	Total Marks : 80

- Note :
1. Solve ANY EIGHT questions from SECTION "A".
  2. All questions from SECTION "B" are compulsory.
  3. All questions carry equal marks.
  4. Draw neat diagrams wherever necessary.

### SECTION "A"

- Q.1 Describe back cross method for transfer of recessive allele.
- Q.2 What is recurrent selection? Enlist its types. Explain in short the recurrent selection for GCA.
- Q.3 What is mutation? Classify types of mutagens with suitable examples and explain the procedure of mutation breeding.
- Q.4 Explain different mechanisms of disease and pest resistance.
- Q.5 What is Ideotype? Explain steps involved in Ideotype breeding.
- Q.6 Answer the following questions (Any four):
- 1) Enlist objectives of plant breeding,
  - 2) Name different models of stability analysis.
  - 3) Enlist different traits used for selection of drought resistant genotype.
  - 4) What are different components of genetic variances?
  - 5) State different methods for estimation of combining ability.
- Q.7 Write short notes (Any four):
- 1) Polyploidy
  - 2) Evolution of hexaploid wheat.
  - 3) Heritability
  - 4) Intellectual property rights
  - 5) Plant genetic resources
- Q.8 Differentiate between (Any four):
- 1) GCA and SCA
  - 2) Heterosis and Inbreeding depression
  - 3) *In-situ* and *Ex-situ* conservation
  - 4) Primary and Secondary gene pool
  - 5) PBR and FR

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- Q.9 Describe Hardy-Weinberg law and factors affecting the equilibrium of population.
- Q.10 What is importance of stability analysis and explain Eberhart and Russel model in short.

**SECTION "B"**

- Q.11 Write botanical name of the following crops.

- 1) Cotton
- 2) Pigeonpea
- 3) Sorghum
- 4) Mango
- 5) Brinjal
- 6) Chilli
- 7) Rice
- 8) Soyabean

- Q.12 a) Expand the followings.

(2)

- 1) IARI
- 2) CICC
- 3) FAO
- 4) UPOV

- b) Give the contribution of following scientists.

(6)

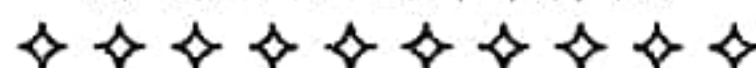
- 1) T.S.Venkataraman
- 2) Muller
- 3) N.E.Borlaug
- 4) G.H.Shull
- 5) M.S.Swaminathan
- 6) Hugo de Vries

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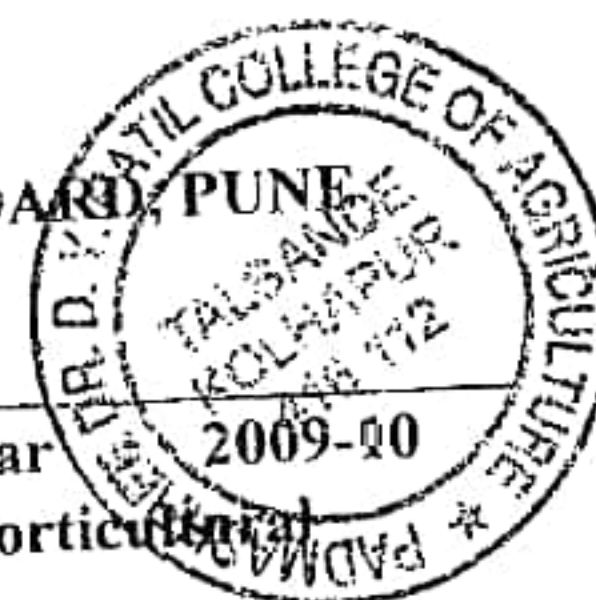
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**SEMESTER END EXAMINATION**  
**B.Sc. (Agri.)**



Semester : IV(New)	Term : II	Academic Year : 2009-10
Course No. : BOT 245	Title : Breeding of Field and Horticultural Crops	
Credits : 3(2+1)	Time : 14.00 to 17.00	Total Marks : 80
Day & Date : Thursday, 29.4.2010		

- Note :**
1. Solve ANY FIVE questions from SECTION "A".
  2. All questions from SECTION "B" are compulsory.
  3. All questions carry equal marks.
  4. Draw neat diagrams wherever necessary.

**SECTION "A"**

- Q.1 Enlist breeding methods used in self pollinated crops. Explain in detail a mass selection method.
- Q.2 Write botanical name, family, chromosome number and breeding objectives of following crops(Any two):
- |         |               |           |              |
|---------|---------------|-----------|--------------|
| 1) Rice | 2) Pigeon pea | 3) Tomato | 4) Groundnut |
|---------|---------------|-----------|--------------|
- Q.3 Describe the Hardy-Weinberg equilibrium and factors that change the same.
- Q.4 Discuss steps involved in Ideotype Breeding. Describe briefly the main feature of wheat ideotype.
- Q.5 Enlist different sources used to develop disease resistance. Explain in brief different ways by which disease resistance can be achieved.
- Q.6 Define genetic resources. Give the reasons for genetic erosion. Describe activities related with germplasm conservation.
- Q.7 Write short notes on-
- |                      |        |                 |                            |
|----------------------|--------|-----------------|----------------------------|
| 1) Combining ability | 2) IPR | 3) Heritability | 4) Measures of variability |
|----------------------|--------|-----------------|----------------------------|

**SECTION "B"**

- Q.8 Define-
- |               |                          |              |               |
|---------------|--------------------------|--------------|---------------|
| 1) Stress     | 2) Vertical resistance   | 3) Inbred    | 4) Polyploid  |
| 5) Back cross | 6) Distant hybridization | 7) Gene pool | 8) Biometrics |
| 9) Heterosis  | 10) Stability analysis   |              |               |
- Q.9 A) Give the long forms of-
- |         |         |         |         |          |
|---------|---------|---------|---------|----------|
| 1) UPOV | 2) IITA | 3) IGFR | 4) CRRI | 5) CPCRI |
|---------|---------|---------|---------|----------|
- B) Give the contribution of following scientists:
- |                  |           |           |                        |         |
|------------------|-----------|-----------|------------------------|---------|
| 1) Van Der Plank | 2) Donald | 3) Fisher | 4) Eberhart and Russel | 5) Flor |
|------------------|-----------|-----------|------------------------|---------|
- Q.10 A) Fill in the blanks:
- 1) Condition of soil water deficiency or water scarcity is called as \_\_\_\_\_.
  - 2) All total deleterious genes present in the population is known as \_\_\_\_\_.
  - 3) Center of origin of Mango is \_\_\_\_\_.
  - 4) UPOV has it's headquarter in \_\_\_\_\_.
  - 5) Papaya belongs to family \_\_\_\_\_.
- B) Enlist two wild species of following crops:
- |         |            |              |           |         |
|---------|------------|--------------|-----------|---------|
| 1) Okra | 2) Brinjal | 3) Sunflower | 4) Cotton | 5) Rice |
|---------|------------|--------------|-----------|---------|

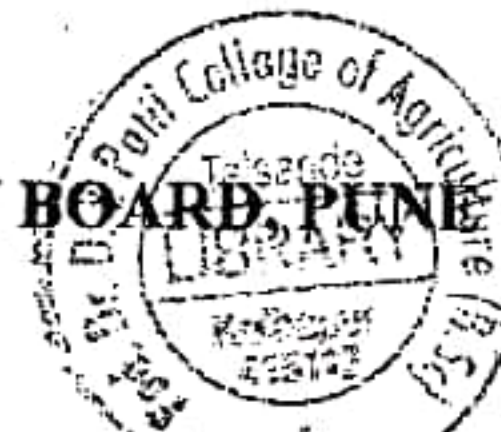




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## MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE SEMESTER END EXAMINATION

B.Sc. (Agri.)



Semester : IV (New)	Term : II	Academic Year : 2011-12
Course No. : BOT 245	Title : Breeding of Field and Horticultural Crops	
Credits : 3 (2+1)		
Day & Date : Wednesday, 02.05.2012	Time : 14.00 to 17.00	Total Marks : 80

- Note :
1. Solve ANY EIGHT questions from SECTION "A".
  2. All questions from SECTION "B" are compulsory.
  3. All questions carry equal marks.
  4. Draw neat diagrams wherever necessary.

### SECTION "A"

- Q.1 Define genetic resources. Enlist various kinds of germplasm. Describe various methods of germplasm conservation.
- Q.2 Write breeding methods and breeding objective along with example of varieties for (Any Two)
- 1) Sorghum                      2) Cotton                      3) Chickpea                      4) Tomato
- Q.3 Describe the Hardy-Weinberg equilibrium. Describe factors to change the same.
- Q.4 Define ideotype. Enlist types of ideotype. Give the important feature of ideotype for wheat and rice.
- Q.5 Enlist different sources used to develop disease resistance. Explain in brief different ways by which disease resistance can be achieved.
- Q.6 Define combining ability and discuss its types.
- Q.7 Write short notes on:
- 1) IPR                      2) Heritability                      3) Measures of variability                      4) UPOV
- Q.8 Explain in brief (Any Two)
- 1) Mechanism of insect resistance                      2) Horizontal and Vertical resistance
- 3) Morphological character associated with drought resistance
- Q.9 Enlist breeding methods in self pollinated and cross pollinated crops. Describe Pedigree method.
- Q.10 Define heterosis. Explain factors affecting on magnitude of heterosis and enlist different ways of estimation of heterosis.

### SECTION "B"

- Q.11 Define the following terms.
- 1) Stress                      2) Multiline                      3) Disease
- 4) Inbred :                      5) Back cross                      6) Gene pool
- 7) Stability analysis                      8) Genetic erosion
- Q.12 a) Give the full forms of following.
- 1) IPGRI                      2) ICRISAT                      3) IRRI                      4) FAO
- b) Enlist two cultivated species of each of the following crops.
- 1) Sorghum                      2) Cotton                      3) Okra                      4) Tomato

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**SEMESTER END EXAMINATION**

**B.Sc. (Agri.)**

<b>Semester</b> : IV (New)	<b>Term</b> : II	<b>Academic Year</b> : 2012-13
<b>Course No.</b> : BOT 245	<b>Title</b> : Breeding of Field and Horticultural	
<b>Credits</b> : 3 (2+1)	<b>Crops</b>	
<b>Day &amp; Date</b> : Friday, 26.04.2013	<b>Time</b> : 14.00 to 17.00	<b>Total Marks</b> : 80

- Note :**
1. Solve ANY EIGHT questions from SECTION "A".
  2. All questions from SECTION "B" are compulsory.
  3. All questions carry equal marks.
  4. Draw neat diagrams wherever necessary.

**SECTION "A"**

- Q.1 a) Define ideotype. (2)  
b) State the steps involved in the ideotype development. (3)  
c) Enlist the characteristics of an ideal Ideotype. (3)
- Q.2 Describe in brief the various approaches for breeding varieties resistant to biotic stresses and discuss their merits and limitations. (8)
- Q.3 Give the breeding methods used, breeding objectives along with names of released varieties in following crops. (8)  
1) Bajra                      2) Rice                      3) Maize                      4) Chilli
- Q.4 Define genetic variance. State the different components of genetic variance and discuss the additive genetic variance. (8)
- Q.5 Discuss on breeding of mango on following aspects. (8)  
1) Breeding methods                      2) Breeding objectives  
3) Cultivated species                      4) Released varieties
- Q.6 Complete the following table. (8)

Sr. No.	Crop	Origin	Botanical Name	Family	Chromosome No	Wild relatives
1)	Wheat					
2)	Chickpea					
3)	Groundnut					
4)	Brinjal					

- Q.7 a) Describe the procedure of back cross to transfer a dominant gene. (6)  
b) State the applications of a back-cross programme. (2)
- Q.8 What do you mean by combining ability? Explain the role of combining ability in crop breeding. (8)

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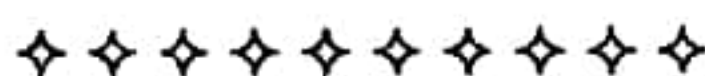
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- Q.9 a) What is recurrent selection? (2)  
b) List the various types of recurrent selection schemes. (2)  
c) Describe the simple Recurrent selection. (4)
- Q.10 Discuss the breeding for drought resistance under the following points. (8)  
1) Genetics of drought resistance 2) Sources of drought resistance  
3) Creation of the drought environment

**SECTION "B"**

- Q.11 Define the following terms. (8)  
1) Distant hybridization 2) Polyploidy  
3) Mutation 4) Gene Pool  
5) Genetic Erosion 6) Clone  
7) Stability 8) Migration
- Q.12 a) Expand the following abbreviations. (4)  
1) NRC 2) IPR  
3) BARC 4) GATT
- b) Fill in the blanks. (4)  
1) Origin of soybean is \_\_\_\_\_.  
2) The science which deals with the application of statistical concepts and procedures to the study of biological problems is known as \_\_\_\_\_.  
3) A method of breeding in which individual plants are selected in  $F_2$  and the subsequent generations and record is maintained is known as \_\_\_\_\_.  
4) When introduced variety is released for commercial cultivation without any alteration in its genotype is known as \_\_\_\_\_.





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**SEMESTER END EXAMINATION**

**B.Sc. (Agri.)**

<b>Semester</b> : IV (New)	<b>Term</b> : II	<b>Academic Year</b> : 2013-14
<b>Course No.</b> : BOT 245	<b>Title</b> : Breeding of Field and Horticultural Crops	
<b>Credits</b> : 3 (2+1)		
<b>Day &amp; Date</b> : Tuesday, 06.05.2014	<b>Time</b> : 14.00 to 17.00	<b>Total Marks</b> : 80

- Note :**
1. Solve **ANY EIGHT** questions from **SECTION "A"**.
  2. All questions from **SECTION "B"** are compulsory.
  3. All questions carry equal marks.
  4. Draw neat diagrams wherever necessary.

**SECTION "A"**

- Q.1 a) Define combining ability and explain its types in short.  
b) Enlist the different models of stability analysis and explain in short the model of Eberhart and Russell.
- Q.2 Write botanical name, chromosome number and specific breeding objectives of the following crops.  
1) Rice                      2) Gram                      3) Cotton                      4) Mango
- Q.3 Enlist the various breeding methods used for improvement of self pollinated crops and explain in detail the procedure of back cross method along with flow diagram.
- Q.4 What is Ideotype? Elaborate in brief the types of ideotype and various steps involved in ideotype breeding.
- Q.5 Describe in detail the procedure of mutation breeding and enlist its applications in crop improvement.
- Q.6 Define biotic stress. Explain the types of genetic resistance to disease and various sources of disease resistance.
- Q.7 Enlist the different types of recurrent selection and describe in detail the procedure of simple recurrent selection along with flow diagram.
- Q.8 Answer the following questions.  
1) Describe the different types of heritability.  
2) Explain in short about different ways of estimation of heterosis.  
3) Give the contribution of Davenport (1908) and Flor (1956).  
4) Elucidate in short about genetic components of variance.
- Q.9 Differentiate between (Any Four)  
1) Traditional breeding and ideotype breeding  
2) Primary gene pool and secondary gene pool  
3) GCA and SCA  
4) Quantitative characters and qualitative characters  
5) Drought avoidance and drought tolerance



Q.10 Write short notes on (Any Four)

- 1) Adaptability.
- 2) Ex- situ germplasm conservation.
- 3) Hardy and Weinberg law.
- 4) Multiple factor hypothesis.
- 5) PPV and FR Act.

**SECTION "B"**

Q.11 a) Fill in the blanks.

- 1) Agharkar Research Institute formerly known as \_\_\_\_\_ Pune.
- 2) Antibiosis is one of the mechanisms of \_\_\_\_\_ resistance.
- 3) \_\_\_\_\_ is the superiority of  $F_1$  over its better parent.
- 4) A new type of gene pool i.e. GP-4 is also referred as \_\_\_\_\_.

b) Define the following terms.

- |                          |                   |
|--------------------------|-------------------|
| 1) Inbreeding depression | 2) Biometrics     |
| 3) Klenducity            | 4) Plant breeding |

Q.12 Give full form of the following.

- |          |         |
|----------|---------|
| 1) GATT  | 2) SBI  |
| 3) AICRP | 4) FAO  |
| 5) DUS   | 6) RRS  |
| 7) SCA   | 8) UPOV |

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**SEMESTER END EXAMINATION**

**B.Sc. (Agri.)**

<b>Semester</b> : IV (New)	<b>Term</b> : II	<b>Academic Year</b> : 2014-15
<b>Course No.</b> : BOT 245	<b>Title</b> : Breeding of Field and Horticultural Crops	
<b>Credits</b> : 3 (2+1)		
<b>Day &amp; Date</b> : Saturday, 16.05.2015	<b>Time</b> : 14.00 to 17.00	<b>Total Marks</b> : 80

- Note :**
1. Solve **ANY EIGHT** questions from **SECTION "A"**.
  2. All questions from **SECTION "B"** are compulsory.
  3. All questions carry equal marks.
  4. Draw neat diagrams wherever necessary.



**SECTION "A"**

- Q.1 Enlist breeding methods used in self and cross pollinated crops. Explain in detail a pure line selection method.

Complete the following table.

Sr.No.	Crop	Origin	Botanical Name	Family	Chromosome No.
1.	Wheat				
2.	Pigeon pea				
3.	Tomato				
4.	Groundnut				

Define plant genetic resources. Enlist various types of germplasm and explain different activities related to germplasm conservation.

- Q.4 Define distant hybridization. Enlist types and explain its role in crop improvement.
- Q.5 Explain major steps involved in Ideotype breeding. Give the main features of Rice ideotype.
- Q.6 Describe different sources used in developing disease resistance.
- Q.7 Discuss in brief about breeding of Cotton on following aspects.
- 1) Breeding methods
  - 2) Breeding objectives
  - 3) Cultivated species
  - 4) Released varieties
- Q.8 State the Hardy-Weinberg law. Explain the factors disturbing/affecting the equilibrium in Mendelian population.
- Q.9 Differentiate between (Any two).
- 1) Heterosis and Inbreeding depression.
  - 2) Horizontal resistance and Vertical resistance
  - 3) Dominance and Over dominance

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Q.10 Write short notes on (Any two).

- 1) Concept of gene pool
- 2) Breeding population
- 3) Gene for gene hypothesis

#### SECTION "B"

Q.11 Define the following terms.

- |                         |                    |
|-------------------------|--------------------|
| 1) Stress               | 2) Genetic erosion |
| 3) Bio-metrics          | 4) Inbred          |
| 5) Multiline            | 6) Migration       |
| 7) Primary introduction | 8) Domestication   |

Q.12 Give the contributions of the following scientists.

- |                   |                     |
|-------------------|---------------------|
| 1) Donald         | 2) Flor             |
| 3) Fisher         | 4) N.G.P. Rao       |
| 5) K.Ramaiah      | 6) Vavilov          |
| 7) Yuan Long Ping | 8) Thomas Fairchild |

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