MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Sc. (Agri.)

Semester	: **III (New)**	**Term**	: **I**	**Academic Year**	: **2012-13**
Course No.	: BOT 233	**Title**	: **Principles of Plant Breeding**		
Credits	: 3(2+1)				
Day & Date	: Tuesday, 23.10.2012	**Time**	: 9.00 to 12.00	**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 heterosis. Explain dominance hypothesis of heterosis. Explain different methods of estimation of heterosis.

Q.2 What is wide hybridization? Explain its different types in short and give role of wide hybridization in crop improvement.

Q.3 Define mutation. State different types of mutation and explain procedure of mutation breeding.

Q.4 What is pollination? Explain different types of pollination with examples and explain different mechanisms responsible for cross pollination in crop plant.

Q.5 Write down the information about botanical name, chromosome number, mode of pollination and mode of reproduction and family of following crops.

1) Sorghum 2) Sugarcane
3) American Cotton 4) Potato

Q.6 Define emasculation. Enlist different methods of emasculation and give procedure for emasculation and pollination of pigeonpea.

Q.7 Define pureline. Explain procedure for pureline selection method with its merits and demerits.

Q.8 Define synthetic varieties and composite varieties. Elaborate procedure for development of synthetic varieties.

Q.9 Differentiate between (Any Two)

1) Gametophytic and Sporophytic system of incompatibility
2) Pedigree method and Backcross breeding method
3) Pureline and Clone

Q.10 Write short notes (Any Four)

1) Physical mutagens 2) Male sterility
3) Apomixis 4) Types of introduction
5) General objectives of plant breeding

(P.T.O.)

SECTION "B"

Q.11 Define the following terms.

1) Adaptability
2) Parthenogenesis
3) Dichogamy
4) Hybridization
5) Mutagen
6) Recipient parent
7) Diplodization
8) Single cross

Q.12 a) Give the contribution of following scientists.

1) Barber C.A.
2) Hughes and Babcock
3) Rimpu
4) Athwal D.S.

b) State true or false if false correct it.

1) Gynodioecy is coexistence of female (male sterile) and harmophrodite individual in a population.
2) In monocious plant male and female flowers are present on different plants.
3) Ethyl methane sulphonate is a example of chemical mutagen.
4) Heterobeltiosis is the superiority of F_1 hybrid over check variety.

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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Sc. (Agri.)

Semester	: **III (New)**	**Term**	: **I**	**Academic Year**	: **2011-12**
Course No.	: BOT 233	**Title**	: **Principles of Plant Breeding**		
Credits	: 3(2+1)				
Day & Date	: Wednesday, 21.09.2011	**Time**	: 9.00 to 12.00	**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 Discuss in short the General objectives of plant breeding.

Q.2 Define male sterility. Explain in detail different types of male sterility.

Q.3 Write a detail note on incompitability.

Q.4 Define mutation. Explain causes and characteristics of mutation. Give the types of mutation with examples.

Q.5 Write the history of plant breeding.

Q.6 Define reproduction and explain different modes of reproduction.

Q.7 Define pollination and describe different modes of pollination.

Q.8 Define heterosis and explain different theories of heterosis.

Q.9 Write short notes on the following.

a) Sythetic varieties b) Composite varieties

Q.10 Define polyploidy and describe different types of polyploidy.

SECTION "B"

Q.11 Fill in the blanks.

1) Progeny of a single plant obtained by asexual reproduction is known as _____.
2) The progeny of a clone is genetically _____.
3) Accumulation of desirable alleles in a population through various breeding techniques is known as _____.
4) Sudden and heritable change in the characteristics of the plant is called as _____.
5) Genetically similar population is known as _____ population.
6) There are two of plant introductions _____ and _____ introduction.
7) _____ refers to the homogeneous progeny of a self pollinated homozygous plant.
8) _____ refers to record of the ancestry of an individual selected plant.

Q.12 Define the following terms.

1) Micro mutations 2) Polyploids 3) Distant hybridization
4) Backcross 5) Plant introduction 6) Acclimatization
7) Pureline selection 8) Mass selection

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b) Fill in the blanks.

1) In 1940 _____ proposed RSGCA for developing synthetic varieties.
2) NBPGR stands for _____.
3) _____method is used to transfer disease resistance in high yielding varieties.
4) Chromosome number of Brinjal is_____.
5) Scientific name of Ridge gourd is_____.

Q.10 Give the contribution of the following scientists:

1) Vilmorin 2) Thomas Fairchild 3) M.S.Swaminathan
4) Harringon J.B. 5) T.S.Venkataraman 6) Huego-devries
7) Hayes and Garber 8) Hughes and Babcock 9) Karpenchenko
10) Shull G.H.

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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Sc. (Agri.)

Semester	**: III (New)**	**Term**	**: I**	**Academic Year**	**: 2010-11**
Course No.	**: BOT 233**	**Title**	**: Principles of Plant Breeding**		
Credits	**: 3(2+1)**				
Day & Date	**: Tuesday, 19.10.2010**	**Time**	**: 9.00 to 12.00**	**Total Marks**	**: 80**

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 a) Define male sterility. What are the different types of male sterility found in crop plants? Narrate briefly the main features of GMS.

b) Define mutation. List the different mutagens along with examples.

Q.2 Distinguish between mass selection and pureline selection.

Q.3 Define recurrent selection. Enlist types of recurrent selection. Explain Simple recurrent selection in detail.

Q.4 Define heterosis. Enlist its theories and explain dominance hypothesis of heterosis with objections.

Q.5 Define hybridization .Write down the common method used for handling breeding generations with its merits and demerits.

Q.6 Enlist different breeding methods used in self and cross pollinated crop.

Q.7 Write short notes on:

1) Synthetic varieties
2) Clonal selection
3) Polyploidy
4) Apomixis

SECTION "B"

Q.8 Define

1) Plant introduction
2) Emasculation
3) Acclimatization
4) Recurrent parent
5) Floral biology
6) Back cross
7) Wide cross
8) Inbreeding depression
9) Mutagens
10) Double cross

Q.9 a) Give one example of the followings.

1) Protandry
2) Androgenesis
3) Gametophytic self incompatibility
4) Bulbis
5) Herkogamy

(P.T.O.)

SECTION "B"

Q.8 Define the following terms.

1) Dichogamy
2) Male sterility
3) Family
4) Polyploidy
5) Backcross
6) Hybridization
7) Isogenic line
8) Pedigree
9) Inbred line
10) Mutagen

Q.9 Give the contributions of following scientists.

1) Borlaug N.E.
2) Patel C.T.
3) Hugo de Vries
4) Goulden
5) Pushkarnath
6) Vilmorin
7) Barber C.A.
8) Swaminathan M.S.
9) Athwal D.S.
10) Rao N.G.P.

Q.10 Fill in the blanks.

1) Presence of male and female organs in same flower is called as _____.
2) Bajra is highly cross pollinated crop due to its _____ condition.
3) _____ is the condition in which anthers and stigma of bisexual flowers mature at the same time.
4) _____ is the process of bringing wild species under cultivation.
5) Crossing leads to increase in _____.
6) Recipient parent is also called as _____.
7) An individual with gametic chromosome number is known as _____.
8) Inbreeding leads to increase in _____.
9) Staminate and pistillate flowers occur on same plant but at different places is known as _____.
10) An individual with one chromosome less than the normal somatic chromosome number is known as _____.

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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Sc. (Agri.)

Semester	:	**III (New)**	**Academic Year**	:	**2009-10**		
Course No.	:	**BOT 233**	**Title**	:	**Principles of Plant Breeding**		
Credits	:	**3(2+1)**					
Day & Date	:	Tuesday, 10.11.2009	**Time**	:	9.00 to 12.00	**Total Marks**	: **80**

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 a) Enlist different breeding methods of self pollinated crops. (4)
b) Explain in detail pureline theory. (6)

Q.2 a) What is heterosis and inbreeding depression? (2)
b) Enlist different theories of heterosis. (2)
c) Explain overdominance theory. (6)

Q.3 a) What is recurrent selection? (2)
b) Enlist different types of recurrent selection. (2)
c) Describe in detail reciprocal recurrent selection. (6)

Q.4 a) What is self incompatibility? (2)
b) Give the different types of self incompatibility. (2)
c) Explain in brief heteromorphic incompatibility. (6)

Q.5 a) Enlist different types of male sterility. (3)
b) Explain in detail the cytoplasmic genetic male sterility. (7)

Q.6 Write short notes on (Any Four)
1) Role of wide hybridization in crop improvement
2) Multilines
3) General objective of plant breeding
4) Characteristics or features of clone
5) Applications of mutation breeding

Q.7 Differentiate between the followings (Any Four)
1) Synthetics and composites
2) Autopolyploidy and allopolyploidy
3) Single and double cross hybrids
4) Emasculation and pollination
5) Pedigree and bulk method

(P.T.O.)

MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Sc. (Agri.)

Semester	: **III (New)**	**Term**	: **I**	**Academic Year**	: **2013-14**
Course No.	: BOT 233	**Title**	: **Principles of Plant Breeding**		
Credits	: 3(2+1)				
Day & Date	: Tuesday, 22.10.2013	**Time**	: 9.00 to 12.00	**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 hybridization. Describe aims, objectives and types of hybridization.

Q.2 Describe in detail procedure of pedigree method.

Q.3 Define male sterility, types and their utilization in crop improvement.

Q.4 Define heterosis, types, hypothesis and utilization in crop improvement.

Q.5 Define mutation breeding. Describe in detail its application in crop improvement.

Q.6 Define polyploids and allopolyploids. Explain application and utilization of allopolyploidy in crop improvement.

Q.7 Define wide hybridization and role of wide hybridization in crop improvemt.

Q.8 Write short notes on the followings.
1) Clonal selection 2) Recurrent selection

Q.9 Differentiate between the following.
1) Composite varieties and synthetic varieties.
2) Pure line and inbred.

Q.10 Define plant breeding. Describe aim, chief and general objectives of plant breeding.

SECTION "B"

Q.11 Define the following terms.
1) Mutagens 2) Acclimatisation 3) Back cross
4) Inbreeding depression 5) Incompatibility 6) Cleistogamy
7) Clone 8) Often cross pollinated species

Q.12 Fill in the blanks.
1) _____ may be defined as the substitution for sexual reproduction of an asexual process which does not involve any nuclear fussion.
2) Gametophytic incompatibility was first reported by _____ and _____(1925) in *Nicotiana sanderae.*
3) In 1903, _____ proposed the pure line theory, that provide the genetic base for individual plant selection.
4) A noteworthy development resulted from the studies of _____ on inbreeding in maize.
5) Triticale is the cross between wheat x_____.
6) This is the dose of a mutagen on which 50 per cent of the mutagen treated individual die_____.
7) In sorghum, bajra and maize, _____ male sterility is used for hybrid seed production.
8) An allopolyploid having two copies of each of the two or more different genomes present is called_____.

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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Sc. (Agri.)

Semester	**: III (New)**	**Term**	**: I**	**Academic Year**	**: 2015-16**
Course No.	**: BOT 233**	**Title**	**: Principles of Plant Breeding**		
Credits	**: 3(2+1)**				
Day & Date	**: Monday, 26.10.2015**	**Time**	**: 9.00 to 12.00**	**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 a) Define Plant Breeding. Give its landmark achievement.

b) Describe in brief activities in Plant Breeding.

Q.2 a) Describe in brief purpose of plant introduction.

b) Define self pollination. Describe the various mechanisms that promote self pollination.

Q.3 a) Define male sterility. Enlist classification of male sterility found in plants.

b) Define aneuploidy. Describe in brief the types of Aneuploids.

Q.4 Differentiate between the followings (Any two).

1) Mass selection and Pure line selection

2) Pedigree method and Bulk method.

3) Synthetics and Composites

Q.5 What is hybridization? Describe in brief different types of hybridization and transgressive breeding.

Q.6 Define heterosis. Enlist theories of heterosis and explain manifestation of heterosis.

Q.7 Write short notes on (Any two).

1) Multiline varieties

2) Breeding procedure of clonal selection

3) General objectives of plant breeding

Q.8 Define recurrent selection. Give its types and explain simple recurrent selection.

Q.9 a) Define mutation. List the different mutagens along with examples.

b) Give main features of interspecific hybridization.

Q.10 a) Define reproduction. Give classification of reproduction.

b) Describe in brief production of hybrid seed by utilizing cytoplasmic genetic male sterility.

(P. T.O.)

SECTION "B"

Q.11 Define the following terms.

1) Combining ability
2) Plant introduction
3) Distant hybridization
4) Doubled haploid
5) Allopolyploid
6) Double fertilization
7) Clone
8) Micro mutation

Q.12 A) Give the contribution of the following scientists.

1) Rimpu (Sweden)
2) D.S.Athwal
3) Borlaug, N.E.
4) Shull, G.H.

B) Fill in the blanks.

1) The gradual loss of variability in the cultivated forms and in their wild relatives is referred as _____.
2) A Japanese variety _____ is the source of dwarfing gene in wheat.
3) CIMMYT stands for_____.
4) Sorghum is a_____ pollinated crop.

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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Sc. (Agri.)

Semester	: **III (New)**	**Term**	: **I**	**Academic Year**	: **2015-16**
Course No.	: BOT 233	**Title**	: **Principles of Plant Breeding**		
Credits	: 3(2+1)				
Day & Date	: Monday, 26.10.2015	**Time**	: 9.00 to 12.00	**Total Marks**	: **80**

Note : 1. Solve **ANY EIGHT** questions from **SECTION "A"**.
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2) Breeding procedure of clonal selection
3) General objectives of plant breeding

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b) Describe in brief production of hybrid seed by utilizing cytoplasmic genetic male sterility.

(P. T.O.)

SECTION "B"

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3) Distant hybridization
4) Doubled haploid
5) Allopolyploid
6) Double fertilization
7) Clone
8) Micro mutation

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2) D.S.Athwal
3) Borlaug, N.E.
4) Shull, G.H.

B) Fill in the blanks.

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3) CIMMYT stands for_____.
4) Sorghum is a_____ pollinated crop.

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