

**MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATIONS BOARD, PUNE**  
**SEMESTER END EXAMINATION**

**B.Sc. (Hort.)**

<b>Semester</b> : I (New)	<b>Term</b> : I	<b>Academic Year</b> : 2014-15
<b>Course No.</b> : H/BOT 111	<b>Title</b> : Principles of Genetics and Cytogenetics	
<b>Credits</b> : 3(2+1)		
<b>Day &amp; Date</b> : Tuesday, 09.12.2014	<b>Time</b> : 10.00 to 13.00	<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 Explain the law of segregation with example. Give reasons of Mendel's success.
- Q.2 Describe the external and internal structure of chromosome.
- Q.3 Define gene interaction. Enlist different types along with its F<sub>2</sub> ratio and explain complementary gene interaction with suitable example.
- Q.4 a) Define linkage. Enlist types of linkage and explain coupling phase with example.  
b) Define multiple allele. Give the characters of multiple alleles.
- Q.5 What do you understand by cytoplasmic inheritance? Give its features and explain it with suitable example.
- Q.6 What is mutagen? Give its classification in detail with suitable examples.
- Q.7 Define polyploidy? Give detail classification of polyploids and give uses of polyploidy in plant breeding.
- Q.8 Classify different types of structural chromosomal aberration and explain any one with suitable diagram.
- Q.9 Differentiate between the following (Any two).  
1) Quantitative and Qualitative characters  
2) Plant cell and animal cell  
3) Meiosis and Mitosis
- Q.10 Write short notes on (Any two).  
1) Penetrance and Expressivity  
2) Watson Crick DNA Model  
3) Sex Influenced Characters

## SECTION "B"

Q.11 Match the following pairs.

"A"	"B"
1) Charles Darwin	a) Operation model
2) Morgan	b) Jumping genes
3) Mc clintock	c) Sex linked inheritance
4) Jacob and Monod	d) Theory of Natural Selection

b) Define the following terms.

- 1) Phenotype
- 2) Lethal gene
- 3) Test cross
- 4) Allele

Q.12 Fill in the blanks.

- 1) \_\_\_\_\_ sudden heritable change in an organism due to change in structure of gene.
- 2) \_\_\_\_\_ is the condition in which both alleles of a pair are expressed fully in heterozygote.
- 3) The genes present on differential region of Y chromosome are called \_\_\_\_\_.
- 4) \_\_\_\_\_ are sites of protein synthesis.
- 5) Phenotypic trihybrid ratio is \_\_\_\_\_.
- 6) A cross in which the order of the parents is reversed is known as \_\_\_\_\_ cross.
- 7) The \_\_\_\_\_ character expresses in  $F_1$ .
- 8) The point of contact between nonsister chromatids during meiosis is called \_\_\_\_\_.

