

MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD  
SEMESTER END THEORY EXAMINATION

B.Sc.(Hons.) Agriculture

Semester : III (New)	[ICAR - Sixth Deans' Committee Syllabus]	Acad. Year : 2025-26
Course No. : GPB-231	Title : Principles of Genetics	
Credit Hrs. : 3(2+1)	Day, Date : Monday, 15.12.2025	Time : 10:00 to 12:00 hrs.
		Total Marks : 40

Note: Draw neat diagram wherever necessary

SECTION 'A' : Questions with Descriptive Long Answers (Any 4)

	Marks
Q.1 Define Gene interaction. Enlist different types of gene interaction along with its F <sub>2</sub> ratios and explain Complementary gene interaction with suitable example.	6
Q.2 Define Mutation, explain the characteristics of mutation. What are different types of mutation?	6
Q.3 Enlist different stages of Meiosis and Mitosis. Describe in detail different stages of Mitosis.	6
Q.4 a) Explain in short the Chromosome structure.	2
b) Describe the components of <i>Lac</i> Operon model of gene regulation.	4
Q.5 a) Write the features of Sex-linked characters. Explain it with suitable example.	4
b) Give reasons for the Mendel's success in his research work.	2
Q.6 a) Describe Watson and Crick Double-helical model of DNA.	4
b) Enlist the factors affecting crossing over.	2

SECTION 'B' : Questions with Descriptive Short Answers (Any 4)

Q.7 Enlist different Structural Chromosomal aberrations.	2
Q.8 Explain in short the different phases of linkage.	2
Q.9 Define Multiple alleles and give its characteristics.	2
Q.10 Define Cytoplasmic inheritance. What are different features of cytoplasmic Inheritance?	2
Q.11 Differentiate between Transcription and Translation.	2

SECTION 'C' : Objective-type compulsory Questions

Q.12 Answer in one sentence:	4
1) Define : Allele.	
2) Which method is used for chromosome mapping?	
3) State the Law of Independent Assortment.	
4) What is the difference between the Oligogenic and Polygenic characters?	

(P.T.O.)

Q.13 Fill in the blanks:

- 1) In incomplete dominance, phenotypic and genotypic ratios are \_\_\_\_\_.
- 2) \_\_\_\_\_ genes cause death of its carrier individuals.
- 3) The cross, in which the order of parents is reversed, is called as \_\_\_\_\_ cross.
- 4) \_\_\_\_\_ organelle is associated with the protein synthesis.
- 5) Simple trisomies has \_\_\_\_\_ chromosome number.
- 6) First time, the cell was seen under microscope by \_\_\_\_\_.
- 7) Multiple factor hypothesis was proposed by \_\_\_\_\_, by conducting the experiment on wheat seed coat color.
- 8) In Chi square test, the observed frequencies are compared to \_\_\_\_\_ frequencies.

