M.Sc. (Ag.) Examination, 2016
Semester-I
Subject: Genetics and Plant Breeding
Course No.: GPB-501
(Principles of Genetics)

Time: Three Hours **Full Marks: 50**

Questions are of value or as indicated in the margin

Group-A

1. **(a) Answer in brief (*any seven*) :** **1.0×7=7.0**

   i) What do you mean by multiple allele? Cite an example of it.
   ii) Define linkage.
   iii) Mention the roles of histone proteins.
   iv) What do you understand by restorer gene?
   v) Define epistasis.
   vi) Write the function of restriction endonuclease.
   vii) State the two important features of vector.
   viii) What is ribozyme?
   ix) Compare Nullisomy and Double Monosomy.
   x) What do you understand by degeneracy of genetic code?

   (b) Match the Column 'A' with Column 'B' : **0.5×6=3.0**

Column 'A'		**Column 'B'**
i) Chiasma	a)	Chromosome Map
ii) Sanger	b)	Agrobacterium tumefaciens
iii) Centimorgan	c)	Hemizygous
iv) Pseudodominance	d)	Genetic Fine Structure
v) Ti Plasmid	e)	DNA Sequencing
vi) Cistron	f)	Crossing Over

Group-B

Answer <u>any four</u> from the following: **10×4=40**

2. Distinguish with suitable sketches between the Anaphase-I of Meosis cell division and Anaphase of Mitosis cell division. Write down the significance of Mitosis cell division. What is G_0 state? 6+2+2=10

3. Why is the DNA replication called semiconservative in nature. Explain the roles of various enzymes involved in the DNA replication of Prokaryotes. 3+7=10

4. What do you mean by gene cloning? Write the steps of DNA amplification using PCR. Why the Taq Polymerase is important for PCR technique? 2+6+2=10

5. Distinguiswh Autopolyploidy and Allopolyploidy. Write down the roles of Allopolyploidy in the evolution of crop plants. 3+7=10

PTO

6. Write short notes on (**any four**) **—** 2.5×4=10
   i) Transposable Genetic Element
   ii) Micro RNA
   iii) Nucleic Acid Hybridization
   iv) Epigenetics
   v) Deviations from Mendel Findings
   vi) Cytoplasmic Male Sterility

7. Differentiate between (**any five**) : 2×5=10
   i) Paracentric and Pericentric Inversions
   ii) Test Cross and Back Cross
   iii) Oncogene and Protooncogene
   iv) Genomics and Proteiomics
   v) Incomplete dominance and co-dominance
   vi) B-DNA and Z-DNA
   vii) Nonsense mutation and Frameshift mutation

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