

14. Genetics

B.Sc. Genetics-I

Total Mark: 100

Appendix 'A'

(Outlines of Tests)

Paper-A:	Principles of Genetics (Written)	:	35 Marks
Paper-B:	Biometry and Quantitative Genetics (Written)	:	35 Marks
Paper-C:	Principles of Genetics (Practical)	:	15 Marks
Paper-D:	Biometry and Quantitative Genetics (Practical)	:	15 Marks

Question paper will include 40 percent objective and 60 percent subjective. To keep the standard of education in case of subjective part question will have 2-3 parts.

Appendix 'B'

(Syllabi and Courses of Reading)

Paper-A: Principles of Genetics

35 Marks

Introduction of Genetics: Cell division	Heredity and variations. Morphology and structure of Eukaryotic Chromosomes, Mitosis & Meiosis
Mendelism	Monohybrid, Dihybrid, Trihybrid Crosses, Mendelian parameters and their locations
Gene interaction	Gene Interaction and lethality, Modifications of Mendelian ratios, Modifying gene and Lethal genes
Gene & environment	Penetrance, Expressivity, Pleiotropism & Nurture. Phenocopies, Twin studies, Nature and
Linkage & Crossing over	Chromosome mapping Crossing over, Methodology of mapping, Interference, Coefficient of Coincidence
Multiple alleles:	Blood groups
Sex linkage	Sex chromosomes, Sex linked inheritance and Sex determination

Paper-B: Biometry and Quantitative Genetics

35 Marks

Introduction:	Biological Variations & Statistics, Population & samples
Frequency distribution:	Presentation of data in frequency tables,

Measures of Central Tendencies	Histograms, frequency curve
Measures of Dispersion (Spread)	Mean Medium and Mode
Probabilities:	Range. Mean deviation, Variance, Standard deviation & Standard error, Coefficient of variation
Chi-square test	Mutually exclusive events and independent events, rules of combining probabilities
Quantitative Genetics:	Goodness of fit and Test of associations
	Polygenic inheritance, Gene & genotypic frequencies, Hardy-Weinberg law, Factors affecting gene frequencies

Paper-C: Practical-I 15 Marks

1. Problems related to Mendelian inheritance, Gene interaction, Gene mapping.
2. Blood Groups-ABO blood groups and Rh factors.
3. Drosophila culture techniques.
4. Study of Mitosis & Meiosis, using Onion root tips and flower buds.

Paper-D: Practical-II 15 Marks

1. Collection of Data
2. Acquisition of random samples, graphical/tabular representation of data
3. Problems related to combining probabilities, central tendencies and dispersion
4. Problems related to chi-square
5. Problems of goodness of fit and independent events
6. Verification of genetic ratios and test of association
7. Problems of gene genotype frequencies
8. Problems related to polygenic inheritance