

15. Genetics

B.Sc. Genetics-II

Total Mark: 100

Appendix 'A'

(Outlines of Tests)

Paper-A:	Molecular and Microbial Genetics (Written)	:	35 Marks
Paper-B:	Genetics of Eukaryotes (Written)	:	35 Marks
Paper-C:	Practical-I	:	15 Marks
Paper-D:	Practical-II	:	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: Molecular and Microbial Genetics **35 Marks**

Prokaryotes & Eukaryotes;	Differences and uniformity
Life Cycles:	Bacteria, Virus, Yeast & Neurospora
Tetrad Analysis:	Yeast (unordered) and Neurospora (ordered)
Nucleic acid as Genetics:	Griffith's experiment, Macleod & Macarty,
Material:	Hershey, Chase & Frankin & Conrat's Experiments
Structure of nucleic acid	DNA & RNA. DNA replication and its kinds
Mutations:	Types, Mutagens, Molecular basis of mutation
Genetic Code :	Genetic Code and its properties
Transcription & Translation:	Stages and processes
Recombination in bacteria:	Transformation, Conjugation and Transduction
Recombinant DNA Techniques:	Introduction to Recombinant DNA technology

Paper-B: Genetics of Eukaryotes **35 Marks**

Human Genetics	Human genome, Pedigree analysis. Genetic Diseases & disorders, Genetic Counseling.
Plant Breeding and Genetics	Principles and methods, Outbreeding and Inbreeding, Methods of crop improvement; Selection, Hybridization, Introduction and Acclimatization and Mutation Breeding Transgenic plants. Arabidopsis genome
Animal Breeding and Genetics	Methods of animal breeding, Selection methods animal

breeding, Selection Outbreeding, Transgenic animals.

Use of recombinant DNA techniques, Artificial insemination, Embryo Transplantation, Heterosis

Paper-C: Practical-I 15 Marks

1. Precautionary measures
2. Sterilization techniques
3. Bacterial culture techniques, solid & liquid media
4. Gram's staining of bacterial culture
5. Study of colonial & cellular morphology of bacteria
6. Counting of cells in culture
7. Yeast culture techniques
8. Staining of Yeast

Paper-D: Practical-II 15 Marks

1. Visit of live stock/poultry farms and report writing.
2. Visit to agriculture research institutions.
3. Candling of eggs.
4. Human Karyotyping from photographs and prepared slides.
5. Problems relating to human pedigree analysis.
6. Emasculation and crossing techniques.

Recommended Books

1. Strickberger M. W., Genetics, Third Edition. Macmillan Publishing, N. Y. London, 1985.
2. Tarantini Robert H., Principles of Genetics, Seventh Edition. McGraw-Hill Higher Education North America, 2002.
3. Zar J.H., Biostatistical Analysis, Fourth edition, Prentice Hall Co. 1998.
4. Adolph K.w., Microbial Gene Techniques (Methods in Molecular Genetics, Vol. 6) Academic Pr; 1995.
5. Streips U.N., R.E. Yasbin, Modern Microbial Genetics 2nd edition.
6. Khan, M.A. E. Bashir and R. Bantel Plant Breeding, National Book Foundation, Islamabad, 1994.
7. Lewis R. Human Genetics. McGraw Hill Co. Inc. N.Y, LISA, 1999.
8. Bourdab, R.W. Understanding Animal Breeding, Prentice Hall Inc. New Jersey USA, 2000.