

## M. Phil. Human Genetics and Molecular Biology (Major Paper I)

### Table of Specifications (ToS)

#### Topic / Chapter Wise Distribution of MCQ,s and SEQ,s

Sr. No.	Chapter / Topic	No. of MCQs	No. of SEQs
01	The Cells <ul style="list-style-type: none"><li>• The Components of Cells.</li><li>• Cell Division and Death.</li><li>• Cell-Cell Interactions.</li><li>• Stem Cells and Cell Specialization.</li></ul>	08	02
02	Meiosis and Development <ul style="list-style-type: none"><li>• The Reproductive System.</li><li>• Meiosis.</li><li>• Gamete Maturation.</li><li>• Prenatal Development.</li><li>• Birth Defects.</li><li>• Maturation and Aging.</li></ul>	07	
03	Molecular Basis of Inheritance <ul style="list-style-type: none"><li>• Experiments Identify and Describe the Genetic Material.</li><li>• DNA Structure.</li><li>• DNA Replication - Maintaining Genetic Information.</li></ul>	09	
04	Gene Action <ul style="list-style-type: none"><li>• Transcription.</li><li>• Translation of a Protein.</li><li>• Protein Folding.</li></ul>	08	02
05	Control of Gene Expression and Genome Architecture <ul style="list-style-type: none"><li>• Gene Expression Through Time and Tissue.</li><li>• Mechanisms of Gene Expression.</li><li>• Proteins Outnumber Genes.</li></ul>	09	
06	Chromosomes <ul style="list-style-type: none"><li>• Portrait of a Chromosome.</li><li>• Visualizing Chromosomes.</li><li>• Abnormal Chromosome Number.</li><li>• Abnormal Chromosome Structure.</li><li>• Uniparental Disomy</li></ul>	08	
07	Gene Mutation <ul style="list-style-type: none"><li>• Causes of Mutation.</li><li>• Types of Mutations.</li><li>• The Importance of Position.</li><li>• Factor That Lessen the Effects of Mutation.</li><li>• DNA Repair.</li></ul>	08	01

08	<b>Immunogenetics</b> <ul style="list-style-type: none"> <li>▪ The Importance of Cell Surfaces.</li> <li>▪ The Human Immune System.</li> <li>▪ Anormal Immunity.</li> <li>▪ Alternating Immune Function.</li> <li>▪ A Genomic View of Immunity-The Pathogen's Perspective.</li> </ul>	07	02
09	<b>Genetics of Cancer</b> <ul style="list-style-type: none"> <li>▪ Cancer Is Genetic.</li> <li>▪ Characteristic of Cancer Cells.</li> <li>▪ Origins of Cancer Cells.</li> <li>▪ Cancer Genes.</li> <li>▪ Environmental Causes of Cancer.</li> </ul>	09	
10	<b>Amplify, Modifying And Monitoring DNA</b> <ul style="list-style-type: none"> <li>▪ Patenting DNA.</li> <li>▪ Amplifying DNA.</li> <li>▪ Modifying DNA.</li> <li>▪ Monitoring Gene Function.</li> </ul>	07	
<b>Total</b>		<b>80</b>	<b>07</b>

### **M. Phil. Human Genetics and Molecular Biology (Major Paper II)**

#### **Table of Specifications (ToS)**

#### **Topic / Chapter Wise Distribution of MCQ,s and SEQ,s**

<b>Sr. No.</b>	<b>Topic / Chapter</b>	<b>No. of MCQs</b>	<b>No. of SEQs</b>
01	<b>Mendelian Inheritance</b> <ul style="list-style-type: none"> <li>▪ The Inheritance of One Gene-Segregation.</li> <li>▪ Mendelian Single-Gene Inheritance in Humans.</li> <li>▪ The Inheritance of Two Genes-Independent Assortment.</li> <li>▪ Pedigree Analysis.</li> </ul>	09	01
02	<b>Non-Mendelian Inheritance</b> <ul style="list-style-type: none"> <li>▪ Alteration of Mendelian Ratios.</li> <li>▪ Maternal Inheritance and Mitochondrial Genes.</li> <li>▪ Linkage.</li> </ul>	09	01
03	<b>Inheritance of Sexual Development</b> <ul style="list-style-type: none"> <li>▪ Sexual Development.</li> <li>▪ Traits Inherited on Sex Chromosomes.</li> <li>▪ X Inactivation.</li> <li>▪ Genomic Imprinting.</li> </ul>	09	01

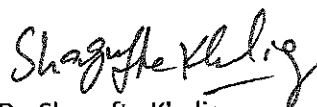
04	<b>Multifactorial Traits</b> <ul style="list-style-type: none"> <li>▪ Genes and the Environment.</li> <li>▪ Investigating Multifactorial Traits.</li> <li>▪ Two Multifactorial Traits.</li> </ul>	09	02
05	<b>Genetics of Behavior</b> <ul style="list-style-type: none"> <li>▪ Genes Contribute to Most Behavioral Traits.</li> <li>▪ Eating Disorders.</li> <li>▪ Sleep.</li> <li>▪ Intelligence.</li> <li>▪ Drug Addiction.</li> <li>▪ Mood Disorders.</li> <li>▪ Schizophrenia.</li> </ul>	09	
06	<b>Population Genetics</b> <ul style="list-style-type: none"> <li>▪ The Importance of Knowing Allele Frequencies.</li> <li>▪ Constant Allele Frequencies.</li> <li>▪ Applying Hardy-Weinberg Equilibrium.</li> <li>▪ DNA Profiling and Hardy-Weinberg Assumptions.</li> <li>▪ Genetic Privacy.</li> </ul>	09	01
07	<b>Changing Allele Frequencies</b> <ul style="list-style-type: none"> <li>▪ Nonrandom Mating.</li> <li>▪ Migration.</li> <li>▪ Genetic Drift.</li> <li>▪ Mutation.</li> <li>▪ Natural Selection.</li> </ul>	08	
08	<b>Genetic Testing and Treatment</b> <ul style="list-style-type: none"> <li>▪ Genetic Counseling.</li> <li>▪ Genetic Testing.</li> <li>▪ Treating Genetic Disease.</li> </ul>	07	
09	<b>Human Ancestry and Eugenics</b> <ul style="list-style-type: none"> <li>▪ Molecular Evolution.</li> <li>▪ Molecular Clock.</li> <li>▪ Eugenics.</li> </ul>	03	01
10	<b>Reproductive Technologies</b> <ul style="list-style-type: none"> <li>▪ Infertility and Sub Fertility.</li> <li>▪ Assisted Reproductive Technologies.</li> </ul>	03	
11	<b>Genomics</b> <ul style="list-style-type: none"> <li>▪ The Human Genome Project.</li> <li>▪ Comparative Genomics.</li> </ul>	05	
	<b>Total</b>	<b>80</b>	<b>07</b>

**Suggested books:**

Genetics by Ricki Lewis 9<sup>th</sup> Edition

Life by David Sadava 9<sup>th</sup> Edition

Cell by Bruce Alberts 5<sup>th</sup> Edition



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