14. Genetics

B.Sc. Genetics-I

Total Mark: 100

Appendix ‘A’
(Outlines of Tests)

<table>
<thead>
<tr>
<th>Paper</th>
<th>Title</th>
<th>Marks</th>
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</thead>
<tbody>
<tr>
<td>Paper-A</td>
<td>Principles of Genetics (Written)</td>
<td>35</td>
</tr>
<tr>
<td>Paper-B</td>
<td>Biometry and Quantitative Genetics (Written)</td>
<td>35</td>
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<tr>
<td>Paper-C</td>
<td>Principles of Genetics (Practical)</td>
<td>15</td>
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<tr>
<td>Paper-D</td>
<td>Biometry and Quantitative Genetics (Practical)</td>
<td>15</td>
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</table>

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 anu 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,
Histograms, frequency curve

**Measures of Central Tendencies**
- Mean
- Medium
- Mode

**Measures of Dispersion (Spread)**
- Range
- Mean deviation
- Variance
- Standard deviation
- Standard error
- Coefficient of variation

**Probabilities:**
- Mutually exclusive events
- Independent events
- Rules of combining probabilities

**Chi-square test**
- Goodness of fit
- Test of associations

**Quantitative Genetics:**
- Polygenic inheritance
- Gene & genotypic frequencies
- Hardy-Weinberg law
- Factors affecting gene frequencies

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### Paper-C: Practical-I 15 Marks

2. Blood Groups-ABO blood groups and Rh factors.
3. Drosophila culture techniques.

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### 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