

**2205**  
**SECOND YEAR B.Sc. Botany**  
**PAPER III:**  
**CYTOGENETICS, PLANT BREEDING,**  
**EVOLUTION AND BIOSTATISTICS**

**Unit-1**

Cell Biology - Structure of cell (of both prokaryotes and eukaryotes); membranes; cell organelles, ergastic substances. Chromatin- euchromatin, heterochromatin. Chromosomes - Type and organization; morphology, chemical constituents; Structural changes in chromosomes and their significance.

**-10 hours**

**Unit-2**

Cell Division - Amitosis, mitosis, meiosis; syneptonemal complex; Linkage and crossing over. Gene (Chromosomal) mapping ; Sex determination.

**-10 hours**

**Unit-3**

Mendel's laws of inheritance - Monohybrid and dihybrid ratio, incomplete dominance; Modifications of dihybrid ratio; cytoplasmic inheritance (Inheritance of plastids and streptomycin resistance in *Chlamydomonas*); Principles of plant breeding. Selection, introduction, clonal propagation, hybridization, mutation breeding.

**-10 hours**

**Unit-4**

Green Revolution, conservation of germplasm, centres of origin. Cytology in relation to taxonomy; Polyploidy; Breeding work on wheat. Indian initiative for genome projects (Rice, Tomato).

**-10 hours**

**Unit-5**

Evolutionary theories, catastrophism, the Lamarck's theory, development of Darwin's theory, Evidences of evolution, adaptations, natural selection patterns of evolution, origin of species. Elementary study of biostatistics; mean, mode, median, standard deviation.

**-10 hours**

**Note:**

The paper setter is required to set questions of 3 types contained in 3 Sections (**Section A**- 10 questions, **Section B**- 10 questions and **Section C**- 4 questions) from the 5 units of each paper. There will be 10 questions in **Section A** which will be asked from all the 5 units, i.e., 2 questions from each unit. These questions have to be answered in one word

or a few words only. Each question will be of half mark. All the questions in **Section A** are compulsory. In **Section B**, 10 questions will be set from the 5 units, i.e., 2 questions from each unit. Students are required to attempt at least 1 question from each unit. Each question will carry 5 marks. The answers of each question should be given in about 250 words. In **Section C** there will be 4 descriptive type questions set from all the 5 units, not more than 1 question from each unit. These questions may also have sub-divisions. The students are required to answer 2 questions, each in approximately 500 words. Each question will carry 10 marks.

In short, pattern of question paper and distribution of marks for UG classes will be as under:

- **Section A:** 10 questions, 2 questions from each unit, short answer, all questions compulsory. Total marks : **05**
- **Section B:** 10 questions, 2 question from each unit, 5 question to be attempted, at least 1 from each unit, answer approximately in 250 words. Total marks : **25**
- **Section C:** 04 questions (question may have sub-division), not more than 1 question from each unit, descriptive type, answer in about 500 words, 2 questions to be attempted. Total marks : **20**