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M.Sc. Semester-I Examination, 2021

GENETICS AND PLANT BREEDING

PAPER: GPB 102 (Theory + Practical)

(CELL BIOLOGY AND CYTOGENETICS)

Full Marks: 65 **Time: 4 Hours**

THEORY

Answer any FOUR questions from the following: **4X10 = 40**

1. Give a short note on polyploidy and role of polyploidy in crop breeding. 5+5
2. Explain the fertilization barriers in crop plants at pre-and post-fertilization levels. 5+5
3. Write a short note on nucleus and endoplasmic reticulum. 5+5
4. Define cell cycle? Mention different check points of cell cycle and explain their importance. 2+3+5
5. Write short notes of the following: 2 × 5
   (a) Synaptonemal Complex
   (b) Homologous chromosome
6. Give a short note on recombination model of crossing over and karyotype. 5+5
7. Define chromosome. Illustrate the ultra-structure of centromere and telomere. 2+4+4
8. Define nucleosome. How histones efficiently take part in DNA packaging? Briefly explain the histone modification. 2+4+4

PRACTICAL

1. Answer any ONE question from the following: **1X15=15**

I. Write the short note on various types of microscopy for cytogenetic study. Define fixative. Write a short note on different fixative preparation. 6+ 3+6

II. Write down the methodology of studying *in vitro* pollen germination. Write down the steps of staining procedure of pollen grains for morphological study. 10+5

2. Answer the following question: **1X10=10**

I. What is karyotype? Write the basic methods of karyotype of a mitotic metaphase chromosome. 2+8

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