

PG CBCS
M.Sc. Semester-IV Examination, 2022
BOTANY
 PAPER: BOT402B (SPL PAPER)
(CYTOGENETICS)

Full Marks: 40

Time: 2 Hours

The figures in the right-hand margin indicate full marks.
 Candidates are required to give their answers in their own words as far as practicable.

GROUP-A**1. Answer any four of the following:** **2×4=8**

- a) How does population genetics differ from mendelian genetics?
- b) Give two examples of secondary signaling molecules.
- c) Mention the significance of S phase of a cell cycle.
- d) Define tubulin and mention its importance during cell division.
- e) Mention the function of p⁵³ in cell cycle.
- f) What is meant by bottle neck effect?
- g) Mention the function of kinetochore during cell division.
- h) Define paracrine and autocrine signaling molecules?

GROUP-B**2. Answer any four of the following:** **4×4=16**

- a) Mention the functions of glyoxysomes and peroxisome.
- b) What is the significance of Lampbrush and Polytene chromosomes?
- c) Write the different factor affecting Hardy-Weinberg equilibrium.
- d) Differentiate between intracellular and intercellular cell signaling.
- e) Briefly describe Broad sense and Narrow sense heritability.
- f) Petal coloration of pea plant where there are all total 276 plants of which 273 have purple petals. Find out the frequency of the dominant and recessive alleles and the frequency of individuals with the dominant, heterozygous and recessive genotype.
- g) Illustrate the structure of actin filaments.
- h) Write down the significance of checkpoints in cell cycle.

**GROUP-C****3. Answer any two questions:** **8×2=16**

- a) The frequency of two alleles in a gene pool is 0.19(A) and 0.81 (a). Assume that the population is in Hardy-Weinberg equilibrium:
 - i) Calculate the percentage of heterozygous individuals in the population.
 - ii) Calculate the percentage of homozygous recessives in the population. 4+4
- b) Briefly describes on G protein couple receptors in cell signaling. 8
- c) Define biological species concept. Classify the different speciation types with examples. 4+4
- d) Give notes on:
 - i) B; and
 - ii) Ultra-structure of plasma membrane