Total pages: 02

PG CBCS
M.Sc. Semester- IV Examination, 2023
BOTANY
PAPER: BOT 402B
(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 questions: 2×4=8
   a) Write down the formula of narrow sense and broad sense heritability.
   b) Define intermediate filaments.
   c) Mention the importance of cell cycle check points.
   d) Distinguish between glyoxysome and peroxisome.
   e) Mention the importance of B chromosome.
   f) Write your concept on receptor molecules.

GROUP-B

2. Answer any **FOUR** from the following questions: 4×4=16
   a) Write down the function of ion channels in transport mechanism of cell cycle.
   b) State the significance of Polytene chromosomes.
   c) Give a short note on factors affecting Hardy-Weinberg's law.
   d) Define speciation. Briefly discuss the different types of speciation. 1+3
   e) Discuss in brief the molecular mechanism of P^{53} regulation on cell cycle.
   f) Give a short note on nuclear DNA content variation across plant kingdom.

GROUP-C

3. Answer any **TWO** of the following questions: 2×8=16
   a) Explain about bottle neck effect.
   The human MN blood- type antigen are determined by two codominant alleles, L^M and L^N. The MN blood types and corresponding genotypes of 398 finns from Karjala are tabulated here.

(P.T.O)

Phenotype	Genotype	Number
MM	L^ML^M	182
MN	L^ML^N	172
NN	L^NL^N	44

Calculate the genotypic and allelic frequency at the MN locus for the kajaria population. 3+5

b) Give a short note on G protein coupled receptors and Steroid hormone receptors and write the importance in cell communication. 4+4

c) Define micro filaments mentioning its significance.
Give a short note on microtubules. 4+4

d) Discuss the molecular mechanism of cell cycle regulation 8

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