



WEST BENGAL STATE UNIVERSITY  
B.Sc. Honours 3rd Semester Examination, 2022-23

**BOTACOR07T-BOTANY (CC7)**

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.  
Candidates should answer in their own words and adhere to the word limit as practicable.  
All symbols are of usual significance.*

1. Answer the following questions in brief: 1×6 = 6
  - (a) What is nullisomy?
  - (b) Define the position effect.
  - (c) Name two intercalating agents.
  - (d) How many bivalents can be observed in meiotic metaphase I of a double monosomic individual of an organism having normal diploid chromosome number  $2n = 18$ ?
  - (e) Determine the probability of drawn a card of diamond at random from a standard deck of 52 playing cards.
  - (f) How duplication loop differs from deletion loop?
  
2. Answer any **eight** questions from the following: 3×8 = 24
  - (a) What do you mean by pedigree analysis? Write down all symbols used in the pedigree analysis. 1+2
  - (b) What is amphidiploidy? Enumerate the evolution of *Raphanobrassica*. 1+2
  - (c) Distinguish between paracentric and pericentric inversion. What will be the meiotic products of paracentric inversion? 2+1
  - (d) Explain photoreactivation in DNA repair mechanism with diagram. 3
  - (e) Briefly describe CIB method to detect sex-linked lethality. 3
  - (f) What is dominant epistasis? Explain with proper example the reason of modification of  $F_2$  ratio from 9:3:3:1. 1+2
  - (g) Distinguish between Polygenic inheritance and Mendelian inheritance. 3
  - (h) Mention the role of transposons in mutation. 3
  - (i) What is inheritance pattern of shell coiling in snails? Explain your answer with proper reason. 1+2
  - (j) Write a brief note on methyl directed mismatch repair. 3
  - (k) Hardy-Weinberg principle might not apply to a particular population— Explain the possible reasons. 3
  - (l) Write down the significance of chi-square test for the prediction of progenies. 3

3. Answer any *two* questions from the following: 5×2 = 10
- (a) How is mutation in rII locus used for complementation test? Explain intragenic recombination in bacteriophage with the help of mutation in rII locus. 3+2
- (b) With suitable diagram briefly describe the cytological basis of crossing over. 5
- (c) What is mutagenesis? Write the different mechanisms of chemical mutagens in mutagenesis. 1+4
- (d) An F<sub>1</sub> individual heterozygous of P, Q, R genes were test crossed and the following progenies were obtained — 1+3+1
- PqR / pqr = 72
- pqR / pqr = 4
- PQR / pqr = 400
- PQr / pqr = 6
- pQr / pqr = 83
- pqr / pqr = 350
- Pqr / pqr = 25
- pQR / pqr = 60

Construct a linkage map with correct order of loci and calculate the map distance of all the three loci with co-efficient of correlation.

—x—