# WEST BENGAL STATE UNIVERSITY

B.Sc. Honours 3rd Semester Examination, 2019

## 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.*

1. Answer the following questions in brief: 1×6 = 6
   (a) Define complete linkage. 1
   (b) What is monosomy? 1
   (c) What is frame shift mutation? 1
   (d) Name one intercalating agent. 1
   (e) Define epistasis. 1
   (f) What is recombination frequency? 1

2. Answer any ***eight*** questions from the following: 3×8 = 24
   (a) Briefly describe the difference between dominance and co-dominance. 3
   (b) Differentiate between back cross and test cross. 3
   (c) What are Kappa particles? Explain the inheritance pattern in *Paramecium*. 1+2
   (d) Describe the meiotic behaviour of paracentric inverted chromosome. 3
   (e) What are base analogues? How do they cause mutation? 1+2
   (f) State the laws of probability. 3
   (g) Distinguish between autopolyploids and allopolyploids. 3
   (h) Mention the major types of DNA repair mechanisms. Name one DNA repair enzyme. 2+1
   (i) Colour blindness is a sex linked inheritance. Explain. 3
   (j) What are trisomics? Draw types of primary trisomics chromosome configurations at metaphase I. 1+2
   (k) Explain the origin of bread wheat. 3
   (l) What does the Hardy Weinberg's law state? What factors affect the Hardy Weinberg's equilibrium? 1+2

3. Answer any ***two*** questions from the following: 5×2 = 10
   (a) What is *r*II locus? Explain the *cis-trans* complementation test in *r*II locus of $T_4$ Phage. 1+4
   (b) How does chromosomal basis of inheritance justify Mendel's Law. 5
   (c) Female Drosophila heterozygous for ebony ($e^+/e$), scarlet ($st^+/st$) and spineless ($ss^+/ss$) were test crossed and the following progenies are obtained – 2+3

| | |
|---|---|
| Wild type- | 67 |
| Ebony- | 8 |
| Ebony, scarlet- | 68 |
| Ebony, spineless- | 347 |
| Ebony, scarlet, spineless- | 78 |
| Scarlet- | 368 |
| Scarlet, Spineless- | 10 |
| Spineless- | 54 |

Determine the correct order of the genes. Calculate the map distances between the genes.

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