



WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 5th Semester Examination, 2022-23

ZOOACOR12T-ZOOLOGY (CC12)

GENETICS

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 any **eight** questions from the following: 2×8 = 16
- (a) What is Karyotype?
 - (b) What happens to the DNA and RNA during mutation?
 - (c) Define multiple allele. Give example.
 - (d) What is competence?
 - (e) Give one example each for homogametic male and heterogametic female and hemigametic male and homogametic female.
 - (f) Explain the effect of duplication on phenotype by citing an example.
 - (g) What is kappa particles?
 - (h) What are LINE and SINE?
 - (i) What is synaptonemal complex?
 - (j) What is Lyon's hypothesis?
 - (k) What is the difference between test cross and backcross?
 - (l) Distinguish between X-linked and Y-linked genes.
2. Answer any **three** questions from the following: 3×3 = 9
- (a) Suppose that a snail had a dextral coiling. Upon self fertilization, it produces progeny all of which showed sinistral coiling. How do you explain results? 3
 - (b) Who proposed the Genic balance theory? Why is this theory called genic balance? What are the chromosomal complements of supermale and superfemale flies in *D. melanogaster*? 1+1+1
 - (c) What are cistron and recon? Mention the difference between complementation and epistasis. 1+1+1
 - (d) State the role of UV rays in causing mutation in DNA. 3
 - (e) What is Alu element? Mention its importance. 2+1

3. Answer any *three* questions from the following: 5×3 = 15
- (a) A test cross was made between a tripple heterozygote plant (ABC/abc) and triply homozygous recessive plant (abc/abc). The following progenies were observed: 3+2
 ABC/abc- 977; abc/abc- 960; aBC/abc- 402; Abc/abc- 427; AbC/abc- 85;
 aBc/abc- 95; ABc/abc- 27; abC/abc- 27.
 Calculate the map distance and draw the genetic map. Calculate the coefficient of coincidence and inheritance.
- (b) What is the difference between paracentric and pericentric inversion? Explain with a suitable diagram the crossing over pattern of a heterozygous individual having paracentric inversion. 1+3+1
- (c) Differentiate between transformation and transduction. Briefly describe the steps of bacterial transduction with a suitable diagram. 1+3+1
- (d) Distinguish between somatic and meiotic crossing over. Discuss the cytological evidence of crossing over in *Drosophila*. 2+3
- (e) Describe the inheritance of haemophilia. 5

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