



'সমানো মন্ত্র: সমিতি: সমানী'

UNIVERSITY OF NORTH BENGAL
B.Sc. Honours 3rd Semester Examination, 2022

CC7- ZOOLOGY

GENETICS

Time Allotted: 2 Hours

Full Marks: 40

The figures in the margin indicate full marks.

1. Answer any **five** questions from the following: 1×5 = 5
 - (a) State the 'law of segregation'.
 - (b) What is allopolyploidy?
 - (c) What do you mean by pleiotropy?
 - (d) Give one example of sex-linked inherited disease in man.
 - (e) What is missense mutation?
 - (f) Name one physical mutagen.
 - (g) What is Barr body?
 - (h) What do you mean by maternal effect?

2. Answer any **three** questions from the following: 5×3 = 15
 - (a) Write the dihybrid cross of Mendel.
 - (b) Explain multiple allelism with the example of ABO blood grouping.
 - (c) Discuss on the bacterial transformation.
 - (d) Explain 'test cross' and 'back cross' with example.
 - (e) Write a short note on 'inversion'.

3. Answer any **two** questions from the following: 10×2 = 20
 - (a) Explain recessive epistasis with suitable example. Write the phenotypic ratio in dominant epistasis. What are the epistatic and hypostatic genes? 7+1+2
 - (b) Classify numerical variations of chromosome. Mention the reason and clinical symptoms of 'Down syndrome' and 'Turner syndrome'. 4+(3+3)

(c) *Drosophila* females heterozygous for three recessive X-linked markers, y (yellow body), ct (cut wing) and m (miniature wing) and their wild type alleles were crossed to triply mutant males. The following progeny were obtained:

Class	Phenotype	Number
1	yellow, cut, miniature	300
2	wild type	330
3	yellow	100
4	cut, miniature	120
5	miniature	80
6	yellow, cut	50
7	yellow, miniature	10
8	cut	10

Total: 1000

- (i) Which classes are parental types? 1+1+2+1
- (ii) Which classes represent double crossovers? +3+2
- (iii) Which gene is in the middle of the other two?
- (iv) What was the genotype of the heterozygous females used in the cross?
- (v) What is the map distance between y and ct; y and m; ct and m?
- (vi) Calculate the coefficient of coincidence.
- (d) What is extrachromosomal inheritance? Discuss in detail about the ‘shell spiralling’ in snail. 2+8

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