

Total page: 1

PG CBCS
M.SC. Semester-III Examination, 2021
ZOOLOGY

PAPER: ZOO 396C (SPL PRC)

(GENETICS & MOL. BIOLOGY PRACTICAL –I & INSTITUTE /LAB VISIT)

Full Marks: 50

Time: 3 Hours

Candidates are required to give their answers in their own words as far as practicable.

Answer TWO questions of the following:

2X25=50

1. On a chicken farm, walnut-combed fowl that were crossed with each other produced the following offspring: walnut-combed, 87; rose-combed, 31; peacombed, 30; and single-combed, 12.
 - i. Using a chi-square test, compare the observed numbers of progeny with those expected from the cross.
 - ii What conclusions can you draw from the results of the chi-square test?
 - iii. Suggest an explanation for these results. 15+5+5
2. Write down the principle, observations and detail procedure of the bone marrow metaphase Chromosome from rat. 5+5+15
3. In fruit flies, curved wings are recessive to straight wings, and ebony body is recessive to gray body. A cross was made between true-breeding flies with curved wings and gray bodies to flies with straight wings and ebony bodies.

The F₁ offspring were then mated to flies with curved wings and ebony bodies to produce an F₂ generation.

114 curved wings, ebony body
 105 curved wings, gray body
 111 straight wings, gray body
 114 straight wings, ebony body

 - A. Diagram the genotypes of this cross, starting with the parental generation and ending with the F₂ generation.
 - B. What are the predicted phenotypic ratios of the F₂ generation?
 - C. Conduct a chi square analysis to determine if the experimental data are consistent with the expected outcome based on Mendel's laws. 5+15+5
4. Write down the working principle of agarose gel electrophoresis. Describe the procedure of plasmid DNA isolation. 10+15

Table of Chi-square statistics

	df	P = 0.05	P = 0.01
1.	3.84		6.64
2	5.99		9.21
3	7.82		11.35
4	9.49		13.28
