



বিদ্যাসাগর বিশ্ববিদ্যালয়  
**VIDYASAGAR UNIVERSITY**

**Question Paper**

**B.Sc. Honours Examinations 2020**

(Under CBCS Pattern)

**Semester - V**

**Subject: ZOOLOGY**

**Paper: C12T & C12P**

**(Genetics)**

**Full Marks : 60**

**Time : 3 Hours**

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

*The figures in the margin indicate full marks.*

**Group - A**

**THEORY**

Answer any *two* questions :

20×2=40

- (a) What is the difference between incomplete dominance and codominance ?
- (b) What is test cross and back cross ?
- (c) Distinguish transition and transversion.
- (d) Write the full form of LINE and SINE.

- (e) What is polygenic inheritance ?
- (f) What is Pleiotropy ?
- (g) Write the genetic constitution of Klinefelter's syndrome.
- (h) What are the methods of genetic recombination ? 8×2.25=20
2. (a) Describe the Genic balance theory of sex determination in *Drosophila*.
- (b) What is Gynandromorphy ?
- (c) What are holandric genes ?
- (d) Why a sex linked gene (X-linked) cannot be passed from a father to his son ? 10+4+3+3
3. (a) Plumage color in mallard ducks is dependent upon a set of 3 alleles :  $M^*$  for restricted mallard pattern,  $M$  for mallard, and  $m$  for dusky mallard. The dominance hierarchy is  $M^* > M > m$ . Determine the genotypic and phenotypic ratios expected in the  $F_2$  from the following crosses :
- (i)  $M^*M^* \times M^*M^*$
- (ii)  $M^*M \times M^*m$
- (iii)  $Mm \times mm$
- (b) What is Complete linkage and incomplete linkage ? Explain 15+5
4. (a) (i) Write the differences between transduction and transformation.
- (ii)  $F^+$  strain and Hfr strain of bacteria. 2×5=10
- (b) (i) What do you mean by euploidy and aneuploidy ?
- (ii) Why frameshift mutation is more deleterious than substitution mutation ? 2×5=10

**Group - B**

**PRACTICAL**

Answer any **one** questions :

20×1=20

1. A short-winged, dark-bodied fly is crossed with a long-winged, tan-bodied fly. All the F<sub>1</sub> progeny are long-winged and tan-bodied. Flies are crossed among themselves to yield

84 long-winged, tan bodied flies;

27 long-winged dark-bodied flies;

35 short-winged, tan-bodied flies

14 short-winged, dark-bodied flies.

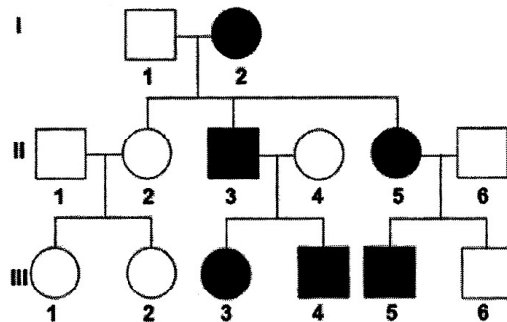
(a) What ratio do you expect in the progeny ?

(b) Use the chi-square test to evaluate your hypothesis. Is the observed ratio within the expected range ?

Control Value of  $\chi^2$  at 0.05 for 3 degrees of Freedom is 7.82

5+5=10

2. The following Pegigree was obtained for a small brown spots on your skin, often in areas that get sun exposure; Freckles.



(a) Deduce the inheritance of this condition, stating your reason.

.5+10

(b) Write the genotype of Generation III. 3 & 5.

2.5×2=5

3. (a) Write the genetic constitution & Characteristics of Turner's Syndrome.

(b) Klinefelter's syndrome, in human.

10+10=20