

**PG CBCS**  
**M.SC. Semester-IV Examination, 2021**  
**ZOOLOGY**  
 PAPER: ZOO 495  
**(PRACTICAL)**  
**(GENETICS AND MOLECULAR BIOLOGY SPECIAL)**

**Full Marks: 50**

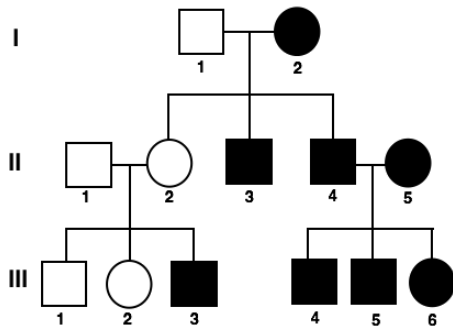
**Time: 2 Hours**

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

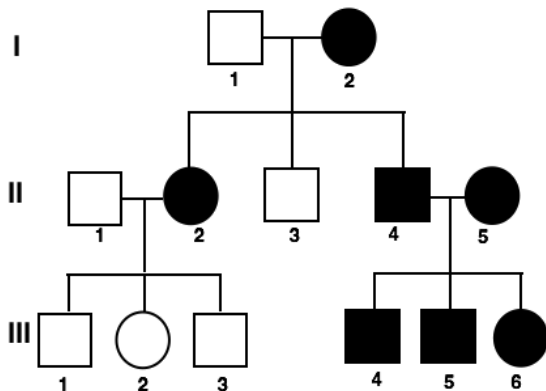
Answer TWO questions of the following:

2X25=50

1. i. Write the principle and procedure of thin layer chromatography. 5+10  
 ii. Explain the inheritance pattern from the pedigree. 10



2. i. Describe the working principle and procedure of SDS PAGE. 5+10  
 ii. Explain the inheritance pattern from the pedigree. 10



(P.T.O.)

(2)

3. i. Describe the working principle, required reagents, procedure of Agarose gel electrophoresis. 5+5+5

ii. A short-winged, dark-bodied fly is crossed with a long-winged, tan-bodied fly. All the F1 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? 2+6+2

4. i. Describe the working principle and procedure of PCR. 5+10

ii. In guinea pigs, the allele for black coat color ( $B$ ) is dominant over the allele for white coat color ( $b$ ). At an independently assorting locus, an allele for rough coat ( $R$ ) is dominant over an allele for smooth coat ( $r$ ). A guinea pig that is homozygous for black color and rough coat is crossed with a guinea pig that has a white and smooth coat. In a series of matings, the F1 are crossed with guinea pigs having white, smooth coats. From these matings, the following phenotypes appear in the offspring: 24 black, rough guinea pigs; 26 black, smooth guinea pigs; 23 white, rough guinea pigs; and 5 white, smooth guinea pigs.

(a) Using a chi-square test, compare the observed numbers of progeny with those expected from the cross.

(b) What conclusions can you draw from the results of the chi-square test?

(c) Suggest an explanation for these results. 10

Table value at 5% level of significance at df 3 is 7.815

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