

**COURSE LS1201**  
**Mid Semester Examination (Time -1 hour)**

**Q1).** The relationship of the I and H genes affects the expression of the ABO blood type in the following ways: genotype HH;AB or Hh; AB produces blood type AB while genotype hh, AB produces blood type O (Bombay blood group). What will be the possible blood group distribution in the progeny if Hh; AB individual marries a hh;AB individual? (4 marks)

**Q2).** In a maternity ward, four babies become accidentally mixed up. The ABO types of the four babies are known to be O, A, B, and AB. The ABO types of the four sets of parents are determined. Indicate which baby belongs to each set of parents: (3 marks)

(a) AB \* O, (b) A \* O, (c) A \* AB, (d) O \* O.

**Q3)** Two students are employing the Chi square test for the same set of data (Dihybrid cross) and get a Chi square value of 9.81. While the 1<sup>st</sup> student rejects the null hypothesis citing the  $p=0.05$  (maximal possible deviation permitted is 7.8) value is much less than 9.81, while the second student accepts the Null hypothesis using  $p=0.01$  (maximal possible deviation permitted is 11.34). Which of the analysis above may result in a flawed conclusion and why? (3.0 marks)

**Q3).** An individual heterozygous for four genes,  $A/a \_ B/b \_ C/c \_ D/d$ , is testcrossed to  $a/a \_ b/b \_ c/c \_ d/d$ , and 1000 progeny are classified by the gametic contribution of the heterozygous parent as follows:

<u>Genotype</u>	<u>No of progeny</u>
$a \_ B \_ C \_ D$	42
$A \_ b \_ c \_ d$	43
$A \_ B \_ C \_ d$	140
$a \_ b \_ c \_ D$	145
$a \_ B \_ c \_ D$	6
$A \_ b \_ C \_ d$	9
$A \_ B \_ c \_ d$	305
$a \_ b \_ C \_ D$	310

Which genes are linked? (5.0 marks)

**Q4.)** The ability to roll ones tongue is dependent on the dominant gene (T). In the pedigree chart depicted below, affected individuals can roll their tongue. Based on the pedigree answer the following question?

1. Is the gene located on the autosome or the Sex chromosome. Justify

*Sumans*  
22/2/19

*Sumans*  
24/4/19

your answer. (2 marks)

2. What is the possible genotype of all the individuals spread over the three generations? (3 marks)

