

SAY SYS



THE OPEN UNIVERSITY OF SRI LANKA

B. Sc. DEGREE PROGRAMME – LEVEL 04 – 2012/2013

Botany – BOU 2101 – Genetics and Evolution

ASSESSMENT TEST 1 – OPEN BOOK TEST (OBT)

Reg. No. _____

DURATION : ONE HOUR (11.00a.m. to 12.00noon) DATE : 23. 03. 2013

ANSWER ALL QUESTIONS

(This paper contains four (04) questions and four (04) pages)

1.

a) What is the difference between following?

- i) Sister and Non-sister chromatids
- ii) Homologous and Non-homologous chromosomes

b) In human beings $2n=46$. How many chromosomes would you find in a

- i) Brain cell?
- ii) Red Blood cell?
- iii) Sperm?

- iv) Pollen grain?
- v) Ovule?

- c) If a male honeybee is haploid (arising from unfertilized eggs) and a queen (female) is diploid, draw a testcross between a dihybrid queen and a male honeybee.

- d) How many different kinds of sons and daughters result from this cross?

2.

- a) In the ABO blood-group system in humans, *A* and *B* alleles are codominant and both are dominant to *O*. In a paternity dispute, a type AB woman claimed that one of four men was the father of her type A child.

Which of the following men could be the father of the child on the basis of the evidence given?

- i) Type A ii) Type B iii) Type O iv) Type AB

Give your evidence diagrammatically (showing crosses).

3. The following three recessive markers are known in rats:

a = albinism; b = bent tail; c = crossed eyes

A trihybrid of unknown origin is testcrossed, producing the following offspring:

Albino, bent, crossed	357
Albino, bent	74
Crossed	66
Bent	79
Wild-type	343
Albino, crossed	61
Bent, crossed	11
Albino	9

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- a) If the genes are linked, determine the relative order and the map distance between them.

b) What was the *cis-trans* allele arrangement in the trihybrid parent?

4. What is/are the possible modes of inheritance in the following pedigree?


