THE OPEN UNIVERSITY OF SRI LANKA
B. Sc. DEGREE PROGRAMME – LEVEL 05 – 2007/2008
Botany – BTU 3111/ BTE 5111 – Plant Breeding

ASSESSMENT TEST 1 – OPEN BOOK TEST (OBT)

Reg. No. ---------------------------------

DURATION : ONE HOUR

DATE : 27th February 2008
TIME : 3.00 p.m – 4.00 p.m

ANSWER ALL QUESTIONS
(This paper contains two questions and six (06) pages)

1.
   a) What is hybrid vigour ?

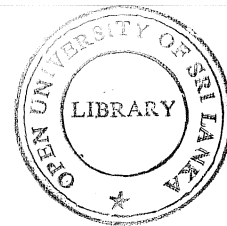   ---

   b) What is/are the advantage/s of hybrid vigour ?

c) How many fundamental populations are found in a plant breeding programme ?

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d) What are they ? Explain them very briefly.

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e) What is combining ability ?

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f) Explain how it is applied in a breeding programme.

2.

a) Name the four types of gene actions identified in a quantitative trait.

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b) Explain them briefly.

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c)

(i) Consider the long pod length (*l*) in *Brassica juncea*. This is a recessive trait. The pod length of the three genotypes of *B. juncea*, AC 7700, AC 5500 and AC 4400 at 4 weeks are approximately as follows.

	Genotype		
	AC 7700	AC 5500	AC 4400
Pod length (mm)	12	10	7

$a = 4$ mm, $d = 2$ mm
Frequency of *l* gene $(q) = 0.4$

Find out the average effects ?

(ii)   Calculate V_A, V_D and V_G. (epistatic deviation = 0.25)

Genotype	$\propto$	d	q
AC 7700	23.5	-1	0.3
AC 5500	18.9	-1	0.4
AC 4400	22.0	-1	0.7