## THE OPEN UNIVERSITY OF SRI LANKA B. Sc. DEGREE PROGRAMME – LEVEL 04 – 2013/2014 Botany – BOU2101 – Genetics and Evolution



ASSESSMENT TEST - OPEN BOOK TEST (OBT)

		Reg. No
DURATION: ONE I	HOUR (2.30p.m. to 3.30p.m.)	
ANSWER ALL QUE (This paper contains fo	STIONS our (04) questions and six (06) pag	es)
heterogametic.  a) Symbolize	or white eyes in $D$ . melanogaster is on the chromosomes the genotype	s recessive and sex-linked.; males are
male, red-e	eyed female (two genotypes), and v	white-eyed female.
male, red-e	eyed female (two genotypes), and v	white-eyed female.
male, red-e	eyed female (two genotypes), and v	white-eyed female.
male, red-e	eyed female (two genotypes), and v	white-eyed female.
male, red-e	eyed female (two genotypes), and v	white-eyed female.
male, red-e	eyed female (two genotypes), and v	white-eyed female.

2. The shape and the colour of turnips are controlled by two independent pairs of alleles that show no dominance; each genotype is distinguishable phenotypically. The colour may be red (AA), purple  $(A^IA)$ , or white  $(A^IA^I)$  and the shape may be long (BB), oval  $(B^IB)$  or round  $(B^IB^I)$ .

Using the Punnet square method, diagram a cross between red, long (AABB) and white, round  $(A^IA^IB^IB^I)$  turnip and summarize the  $F_2$  results under the headings phenotypes, genotypes, genotypic frequency, and phenotypic ratio.

a) THE PUNNET SQUARE

b) PHENOTYPES GENOTYPES GENOTYPIC PHENOTYPIC FREQUENCY RATIO

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b) PHENOTYPES GENOTYPES GENOTYPIC PHENOTYPIC FREQUENCY RATIO

3. In an experiment with *Drosophila melanogaster*, females with cut wings (ct), vermilion eyes (v) and forked bristles (f) were mated to wild type males. The  $F_1$  females were then backcrossed to  $ct\ v\ f$  males and 1000 progeny were scored:

Phenotype	No. of Progeny	Phenotype	No. of Progeny
+++	341	ct v +	96
ct v f	329	+ + f	104
ct + +	47	ct + f	16
+ v f '	53	+ <b>v</b> +	14
19			

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ii) If the genes are linked, determine the gene order.	

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(a) Dominance			•	
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(b) Partial (incomp	olete) dominance			
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(c) Co-dominance	<b>)</b>			
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