

## Biology 1AL Lab Exam 1: Grading Rubric

### Question 2: (4 pts)

- a) (-1pt) If answer other than key.
- b) (-1pt) If answer other than as in key.
- c) (-2pts) If incorrect answer. Answer in key is incorrect. Correct answer is  $128$  or  $1/(1/256 + 1/256)$ .
- (-1/2 pt) if errors in addition.

### Question 3: (4 pts)

- a) (-2pts) If other than  $\frac{1}{2}$  (or 50%).
- b) (-2pts) If other than  $\frac{1}{4}$  (or 25%).
- No partial credit.

### Question 4: (4 pts)

The Punnet square in the key was incorrect. It is correctly shown here.

	0.4 DE <sup>+</sup>	0.4 D <sup>+</sup> E	0.1 DE	0.2 D <sup>+</sup> E <sup>+</sup>
0.4 DE	No	Yes = 0.16	No	No
0.4 D <sup>+</sup> E <sup>+</sup>	No	No	No	No
0.1 D <sup>+</sup> E	No	Yes = 0.04	No	Yes = 0.01
0.1 DE <sup>+</sup>		No	No	No

Correct Answer:  $(0.5) \times (0.16 + 0.04 + 0.01)$

- (-1pt) If not 0.5 for B<sup>+</sup>.
- (-1pt) For each part incorrect in  $(0.16 + 0.04 + 0.01)$  up to -3.
- (-1pt) For addition errors.
- (-1pt) For miss identified cells.

### Question 5: (5 pts)

- (-1pt) Each incorrect lane.
- No partial credit.

**Question 6: (6 pts)**

a) No partial credit.

(-1 pt) If total of phosphodiester bonds is not 4.

b) No partial credit.

(-2 pt) If the answer was not ONLY blue colonies.

c) Partial credit.

• First question:

(-1 pt) If you picked other than a blue colony to isolate your desired recombinant plasmid.

• Second question:

(Full Credit, no points deducted) If you said that you were NOT 90-100% confident that your selected colony contains your desired recombinant plasmid (pBio1B plasmid into the pBio1A plasmid), AND you provided a plausible explanation. An example of a plausible explanation is as follows: "There is a low probability that the colony contains our recombinant plasmid because pBio1A can religate with itself and pBio1B can religate with itself. Consequently, most of the blue colonies represent successful pBio1A or pBio1B transformed bacteria. Very few of the colonies represent successful recombinant plasmid transformed bacteria."

(-1 pt) If you said that you were NOT 90-100% confident that your selected colony contains your desired recombinant plasmid (pBio1B plasmid into the pBio1A plasmid), AND you provided a plausible explanation, BUT your choice of vocabulary made part of your explanation incorrect.

**Question 7: (4 pts)**

Partial credit.

(-1 pt) If you the order of the pathway is not  $Q \rightarrow S \rightarrow P \rightarrow R$

(-1 pt) If anything on arrow between Q and S is other than Mutant 4.

(-1 pt) If anything on the arrow between S and P is other than anything Mutants 2 & 3.

(-1 pt) If anything on the arrow between R and R is other than anything Mutants 1 & 5.

**Question 9: (3 pts)**

(-3pts) If circular.

(-2pts) If linear but nothing else is correct.

(-1pt) If linear AND both maps for Eco R1 and Pst 1 were individually correct, labeled as such and included the correct fragment sizes. But, the combined map did not work or the

combined map was unlabeled (either excluding names of restriction enzymes, cut sites or fragment sizes)

**Full Credit:** As above except that the "combined" map had to yield the correct sizes. Each site had to be labeled with the correct restriction enzyme and some indication of the sizes generated. A few students correctly drew the combined map, fully labeled, etc without drawing two separate maps and received full credit.

**Question 10: (6 pts)**

**For each Genotype required:**

(-1 pt) If wing color gene NOT autosomal and/or NOT correct genotype. Female is heterozygous. For male, accepted genotype for either F1 male fly (heterozygous) or actual male fly mated to F1 female fly (homozygous).

(-2 pts) If vein color and abdomen size genes NOT physically linked on X chromosome and/or NOT correct genotype for vein color and abdomen size genes. For male fly genotype, accepted genotype for either F1 male fly or the actual male fly that was mated to F1 female.

Graded "all-or-none." No partial credit.

Notation: Must be consistent and use correct fruit fly notation: Correct letter and case (reference = mutant, fraction, semicolon, etc.). Incomplete dominance for wing.

b or B+ = white, b+/b+ = white or B+/B+ = white

b or B = black, b/b = black or B/B = black

b+/b or B/B+ = gray

d = dark

d+ = WT (wild-type) = clear

n = narrow abdomen

n+ = WT = wide abdomen

**(No credit: -3pts for each required Genotype):**

- If used W for white wing, no credit.
- If b+ for black, since black was mutant (and not WT, what "+" means)--must use fruit fly notation, b or B = black, b+ or B+ = white. "Allele name" from mutation.
- If put all 3 genes on X or all 3 genes on autosome.

**Additional Deductions:**

- (-1/2 to -1 pt) Deducted for things added to notation that shouldn't be there.
- (-1pt) If no legend was included.