

BISC 100 MIDTERM 2

READ ALL OF THE QUESTIONS CAREFULLY BEFORE ATTEMPTING TO ANSWER THEM. YOU WILL BE MARKED ON THE QUALITY, NOT QUANTITY, OF YOUR ANSWERS.

Answer **either** 1a or 1b

1a) Some people swear that their plants grow better when exposed to stereophonic music. Explain why this is likely to be or not be so and then provide an experimental design to test your idea.

2) Categorize each of the following statements as TRUE or FALSE and explain your choice:

- i) Energy is removed from carbohydrates by reducing them
- ii) Protons always move from a lower to a higher concentration during chemiosmosis
- iii) Mitochondria carry their own set of genetic material and enzymes
- iv) $\text{ATP} + \text{WATER} \rightleftharpoons \text{ADP} + \text{P}$ is a highly favoured reaction
- v) Enzymes can catalyze reactions by applying physical stress to reactants - this causes shape changes leading to changes in substrate charge
- vi) Violet light (300 nm) photons carry more energy than do red light photons(700 nm)
- vii) CAM plants use the four carbon (C4) pathway
- viii) The polygenic trait, human height, can be explained by independent segregation rules just like monogenic (Mendelian) traits like attached ear lobes.
- ix) All stem cells are pluripotent.

3) In genetics, what is meant by the term mutation? What effects can mutations have? Why are most mutations either harmful or neutral in their effects?

4a) How does cell division from meiosis differ from cell division from mitosis?

OR

4b) Do you expect most anaerobes to be limited in size? Explain why this is so.