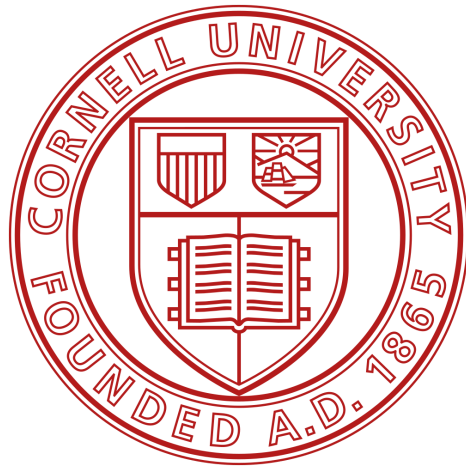


# Protein Modeling Division C- Answer Sheet

Cornell University Science Olympiad Invitational

November 23, 2019



*Written by Sophia Velasco, University of Florida, B.S. Biochemistry 2023*

**Team Number:** \_\_\_\_\_

**Team Name:** \_\_\_\_\_

**Exam Points:** \_\_\_\_\_/209      **Computer Exploration Points:** \_\_\_\_/44

**Rank:** \_\_\_\_\_

## Instructions and Clarifications:

- You have **50** minutes to finish this exam and the computer exploration of protein structure. The **Exam** portion is composed of Section **I** and **II** and is worth 30% of the overall score. The **Computer Exploration** portion is composed of Section **III** and is worth 30% of the overall score.
- Each **participant** may bring **one** 8.5" x 11" sheet of paper that contains information about this event without any annotations or labels affixed along with writing utensils for each participant.
- You **may** split the exam but you are responsible for placing them in the correct order afterwards.
- Write your team number in **every** page of the answer sheet.
- There are **5** tiebreakers in this exam. They are marked **TB#**.
- Anything written on the exam will **not** be graded. Only the **answer sheet** will be graded.
- If you have any questions or comments about this exam, feel free to email me at [velasco.scienceolympiad@gmail.com](mailto:velasco.scienceolympiad@gmail.com). **Happy testing!**



Team Number: \_\_\_\_\_

## Section I: General Biochemistry


1. \_\_\_\_\_  
\_\_\_\_\_

2. \_\_\_\_\_  
a. \_\_\_\_\_  
b. \_\_\_\_\_  
c. \_\_\_\_\_

3. \_\_\_\_\_  
a. \_\_\_\_\_  
b. \_\_\_\_\_

4. \_\_\_\_\_  
\_\_\_\_\_

5. \_\_\_\_\_  
\_\_\_\_\_

6. 



Team Number: \_\_\_\_\_

7.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_

8.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_
- f. \_\_\_\_\_
- g. \_\_\_\_\_

9.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_

10.

- a. \_\_\_\_\_
- b. \_\_\_\_\_

11.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_

12.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_
- f. \_\_\_\_\_



Team Number: \_\_\_\_\_

13.

- a. \_\_\_\_\_
- b. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

14.

- A. \_\_\_\_\_
- B. \_\_\_\_\_
- C. \_\_\_\_\_

15.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_



Team Number: \_\_\_\_\_

## Section II: DNA/RNA Structure, CRISPR-Cas 9 and Cytidine Deaminase

**Directions:** Answer the following questions about DNA/RNA, CRISPR-Cas 9 and Cytidine Deaminase. The point values for each question are addressed in the parentheses.

1.
  - a. \_\_\_\_\_  
\_\_\_\_\_
  - b. \_\_\_\_\_
  - c. \_\_\_\_\_
  - d. \_\_\_\_\_
  
2.
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_
  - c. \_\_\_\_\_
  - d. \_\_\_\_\_  
\_\_\_\_\_
  - e. \_\_\_\_\_
  
3.
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_
  - c. \_\_\_\_\_
  - d. \_\_\_\_\_
  - e. \_\_\_\_\_  
\_\_\_\_\_
  
4.
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_
  - c. \_\_\_\_\_
  - d. \_\_\_\_\_
  - e. \_\_\_\_\_



Team Number: \_\_\_\_\_

5.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_

6.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_

7.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_

8.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_

9.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_

10.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_



Team Number: \_\_\_\_\_

11.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_

12.

- a.
  - i. \_\_\_\_\_
  - ii. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_

13.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_

14.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_

15.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_



Team Number: \_\_\_\_\_

### Section III: Computer Exploration

1.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_

2.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_

3.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_

e.



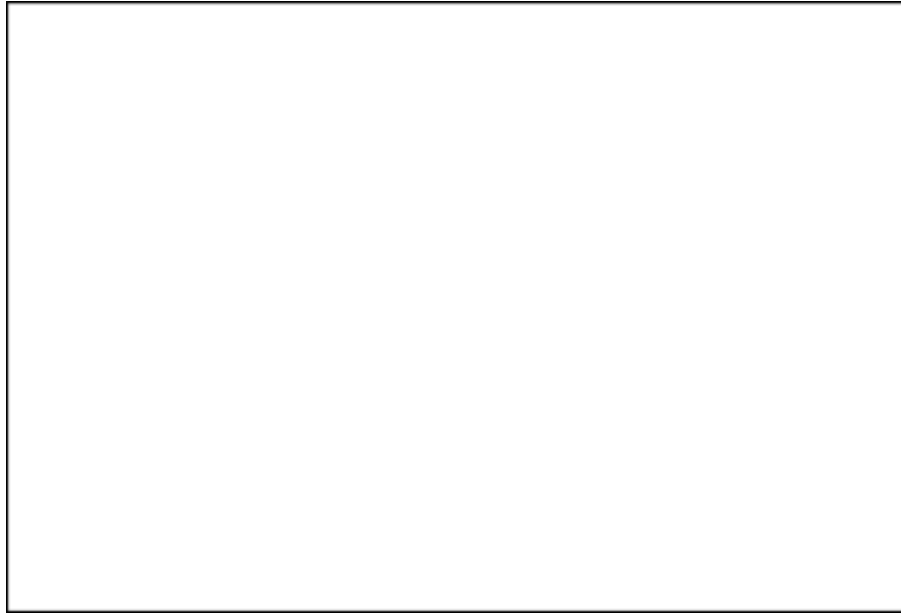


Team Number: \_\_\_\_\_

4.

a. \_\_\_\_\_

b. \_\_\_\_\_

c. 

5.

a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

d. \_\_\_\_\_

e. \_\_\_\_\_

6. \_\_\_\_\_

7. \_\_\_\_\_

8. \_\_\_\_\_

9. \_\_\_\_\_

10. \_\_\_\_\_