General Instructions

- Please upload a single Word document with your responses to the questions/tasks.
- Submission will be assessed according to the marking rubric available on Canvas.
- Response should be in the order presented in this document.

Task 1.

Title and Introduction:

Introduce your assignment topic with background information and functions of LDH with references. (Include relevant information from the practical component including NADH.)

Word limit: 300-500 (Will be assessed on the quality of the content and the quality of the scientific writing style appropriate for second year science undergraduate students.)

Task 2

Background information on enzyme kinetics, describe the Michaelis-Menten Equation and its derived double-reciprocal Lineweaver-Burk plot in detail. Please revisit these contents in your previous Biochemistry unit. Reading material: Principle of Biochemistry chapter 6.3.

Word limit: 300-500

1. Should have information on the equation.
2. Should include the effect of competitive and non-competitive inhibitor on the enzyme kinetics and their effects on the Lineweaver-Burk plot.
3. Should include the typical graphs on competitive and non-competitive inhibition.

Task 3

Aims of the experiment are included and described correctly

One or two sentences maximum.

Task 4

Result 1:

1. Table 1 (Absorbance without inhibitor……. See reference excel file, tab 1) Title, column heading, unit.
2. Graph 1 (Scatter graph from Table-1, x: time, y: A340, combine A340 kinetics in multiple substrate concentration)

   Correct graph, proper titles, Axis, units, legend, error bar or range
3. Interpretation (Two to five sentences)

Result 2

1. Table 2 (Absorbance with oxalate... See reference excel file, tab3) Title, column heading, unit
2. Graph 2 (Scatter gram from Table-2, x: time, y: A340, combine A340 kinetics in multiple substrate concentration)
   Correct graph, Titles, Axis, Units, legend, error bar or range
3. Interpretation (Two to five sentences)

Result 3:

1. Table 3 (LDH activity without inhibitor, Key Enzymatic Parameters ... See reference excel file, tab2, also include estimation of Vmax and Km based on linear regression of the double reciprocal plot) Title, column heading, unit
2. Table 4 (LDH activity with inhibitor, Key Enzymatic Parameters ... See reference excel file, tab4, also include estimation of Vmax' and α' based on linear regression of double reciprocal plot) Title, column heading, unit
3. Graph 3 (combined Michaelis-Menten plot from Table 3 and 4)
4. Graph 4 (combined Lineweaver-Burk plot from Table 3 and 4)
5. Interpretation (Two to five sentences, determine whether oxalate inhibit the reaction competitively or noncompetitively)

Task 5

Discussion

Word limit: 300-500

1. **Interpretation of the results, especially discuss the nature of oxalate inhibition (competitive OR non-competitive) based on the Michaelis-Menten and Lineweaver-Burk plot.**
2. **Discuss the possible source of errors that most significantly affect the results.**

Task 6

Conclusion:

Word limit: 50

A final conclusion is present and is appropriate based on the results obtained

Task 7

Reference list: The report contains a reference list presented using the Harvard referencing style

Referencing guideline: Use Harvard style for this assignment

Final Note

Calculation: Detailed calculations on Table 3.4, particularly how the Vmax, Km, Vmax' and α' are derived should be elaborated on. This also helps you sort these things out.

Linear regression of Lineweaver-Burk plot: Based on the relationship between [pyruvate] and Velocity, some data points may not be included in the linear regression function.