

## 6. Kinetics

During the Calvin cycle, the enzyme transketolase converts glyceraldehyde-3-phosphate and sedoheptulose-7-phosphate to pentose phosphates. The following kinetic data was observed when 1 nmole of enzyme was incubated with the indicated concentrations of the two reactants; the velocity is stated as the initial  $d[\text{pentose-phosphate}]/dt$  observed. Determine the  $K_m$  for each reactant, the  $k_{cat}$  of the enzyme, and the mechanism type.

		[sedoheptulose-7-phosphate] (mM)					
		0.3	0.6	1	2	5	15
[glyceraldehyde-3-phosphate] (mM)	0.3	6.6	7.9	7.9	8.3	8.7	8.9
	0.5	9.4	11.4	11.9	12.6	13.5	14.0
	1	12.8	17.2	18.8	21.0	23.3	23.2
	2	16.3	22.9	29.5	33.3	34.9	38.7
	5	19.8	29.4	39.8	48.5	56.3	61.8
	10	20.7	32.2	43.4	55.2	62.9	71.4

## 7. Mechanism

Show the reaction and mechanism catalyzed by the pyruvate dehydrogenase complex, showing all cofactors, reagents, intermediates, and products; and the movement of all electrons

## **8. Practical**

Draw out the Edman reaction used for amino acid sequencing of proteins. Discuss the reagents and conditions to used to carry this process out. Discuss the limitations of this technique, and the methods used to ameliorate them.

## 9. Structure

Sketch the standard nucleotides in their regular Watson-Crick base pairing arrangement, as well as in the alternative wobble pairings. Show all H-bonds. Briefly state the importance of the wobble base pairings.

## **10. Metabolism**

Discuss the difference between ketogenic and glucogenic amino acids in humans. Sketch the pathways needed to show both of these processes, and show why this distinction is not found in plants and many bacteria. Explain the relevance of this distinction to a low-carbohydrate – high protein diet in humans.