

CHM 3352

Exam 3

TUD Department of Chemistry

Summer 2019

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1-14 5.5 pts each

15 20 pts

Questions 1-7 pertain to the citric acid cycle. (required for everything except enzymes)

- 1) Pyruvate dehydrogenase (using CoA and NAD⁺) converts what (name and structure) into an AcCoA and CO₂?
- 2) Other than isocitrate dehydrogenase, name an enzyme which uses NAD⁺ as a cofactor?
- 3) What enzyme uses GDP as a cofactor?
- 4) Draw the reactant in the reaction catalyzed by succinate dehydrogenase.
- 5) Draw and name the product that results when aconitase acts upon citrate.
- 6) Draw the structure of fumarate.
- 7) How many total ATP and GTP molecules are produced in one turn of the citric acid cycle?

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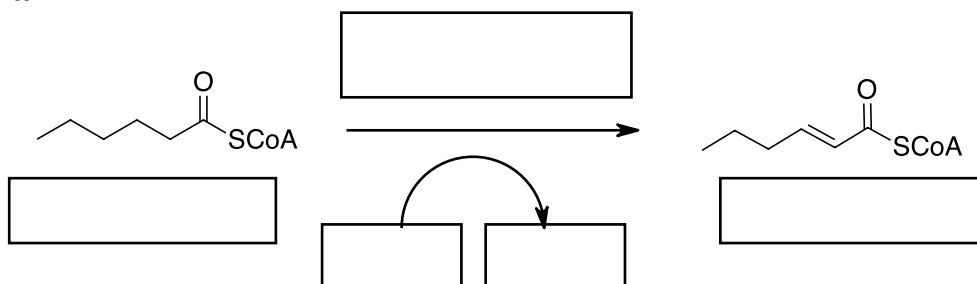
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Questions 8-10 refer to the β -oxidation of fatty acids

- 8) What enzyme results in the release of an AcCoA?
- 9) What enzyme, using an ATP and CoA, converts a fatty acid into a fatty acyl CoA?
- 10) Fill in the name of the reactant, enzyme, cofactor and product for the reaction below::



Questions 11-14 refer to gluconeogenesis

- 11) What enzyme converts pyruvate to oxaloacetate?
- 12) PEP carboxykinase converts what (name and structure) into PEP?
- 13) Draw the structure of 2-phosphoglycerate.
- 14) What enzyme(s) use(s) ATP/ADP as cofactors?
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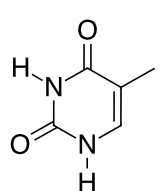
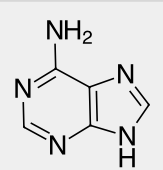
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15) Match the name to the structure:

$\begin{array}{c} \text{CH}_2\text{OH} \\ \\ \text{C}=\text{O} \\ \\ \text{CH}_2\text{OPO}_3^{2-} \end{array}$	
$\begin{array}{c} \text{CO}_2^- \\ \\ \text{H}-\text{C}-\text{OPO}_3^{2-} \\ \\ \text{CH}_2\text{OH} \end{array}$	
$\begin{array}{c} \text{CO}_2^- \\ \\ \text{HO}-\text{C}-\text{H} \\ \\ \text{H}-\text{C}-\text{H} \\ \\ \text{CO}_2^- \end{array}$	
$\begin{array}{c} \text{CO}_2^- \\ \\ \text{C}=\text{O} \\ \\ \text{CH}_3 \end{array}$	
	
$\begin{array}{c} \text{CHO} \\ \\ \text{H}-\text{C}-\text{OH} \\ \\ \text{CH}_2\text{OPO}_3^{2-} \end{array}$	
$\begin{array}{c} \text{CO}_2^- \\ \\ \text{C}=\text{O} \\ \\ \text{H}-\text{C}-\text{H} \\ \\ \text{CO}_2^- \end{array}$	
	
$\begin{array}{c} \text{CO}_2^- \\ \\ \text{HO}-\text{C}-\text{H} \\ \\ \text{CH}_3 \end{array}$	

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- A. 2-Phosphoglycerate
- B. Dihydroxyacetone phosphate
- C. Fumarate
- D. Phosphoenolpyruvate
- E. L-lactate
- F. Malate
- G. Glyceraldehyde-3-phosphate
- H. Pyruvate
- I. Oxaloacetate
- J. Adenine
- K. Guanine
- L. Cytosine
- M. Uracil
- N. Thymine