Examination in Technical Biology

December 19, 2012, kl 08.00-13.00, Evak: 1-5

Note: Hand in your answer in two separate cover paper according to:
A = Questions 1-3
B = Questions 4-7

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1. Why do β-lactam antibiotics have a higher therapeutic index than most other antibiotics? (1 p)

2. Explain the biorefinery concept. (1 p)

3. What is special about lignin and its biodegradability? (1 p)

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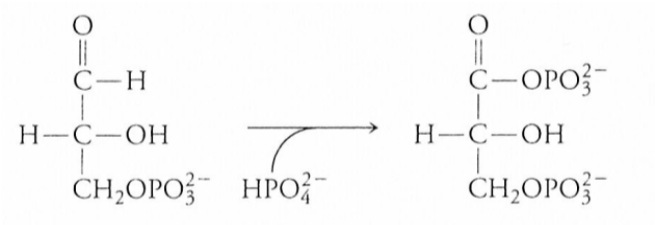
4. The common intermediates listed in the table below appear as reactants or products in several metabolic pathways. Place an "X" in the correct box that indicates the appropriate pathway for each intermediate. (2 p)

	Glycolysis	**Tricarboxylic acid cycle**	**Fatty acid synthesis**
Acetyl-CoA			
Glyceraldehyde-3-phosphate			
Pyruvate			

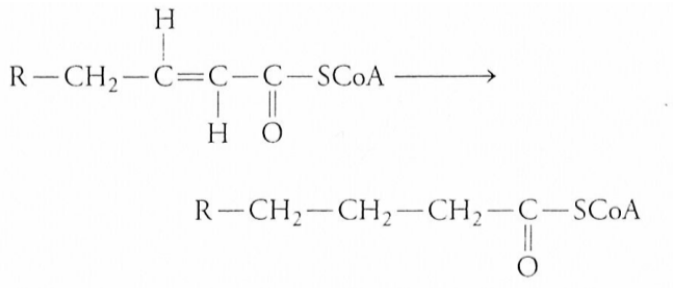
5. For the glycolytic reaction shown below:

   (a) Explain whether the reactant is being oxidized or reduced, (0.5 p)
   (b) Identify which cofactor (NAD^+, $NADP^+$, NADH, or NADPH) is involved in the reaction. (0.5 p)



6. For the fatty acid synthesis reaction shown below:

(a) Explain whether the reactant is being oxidized or reduced, (0.5 p)
(b) Identify which cofactor (NAD^+, $NADP^+$, NADH, or NADPH) is involved in the reaction. (0.5 p)



7. Photo synthesis: explain briefly how light reaction and dark reaction are connected. Consider how these reactions are coupled in terms of the electron carriers (cofactors) and the energy currency. (1 p)