

Name:

Signature:

Matriculation No.:

Participation No.: 1, 2 or 3 (circle appropriate)

Prof. Meckenstock / Prof. Siebers

PKZ: 1722 / 40105 / 40191

**Part A: Prof. Meckenstock**

- 1) A company has a big tank of waste with 0.5 M glucose. Instead of pumping oxygen for a long time, they want to mix in nitrate once to let it all be degraded to CO<sub>2</sub> and nitrogen. How much nitrate do they have to add? Explain by showing the redox equations  
(10 points)



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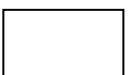
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- 2) If *Clostridium acetobutylicum* would be present in the closed tank filled with glucose of question 1 and they would **not** add nitrate, what would be the potential products, in what sequence would they appear, and why?

(10 points)



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- 3) Explain why a chemostat is better suited to mimic environmental conditions than a batch culture.

(7 points)



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4) Redox zonation:

- a. Explain the reasoning of the redox zonation model in lake sediments (6 points)
- b. How does that compare to contaminated aquifers? (7 points)



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5) What are NAPLs and what is the correlated problem concerning remediation of a contaminated site?

(10 points)

