

Examination in Technical Biology

December 16, 2011, kl 08.00-13.00, Vic: 1C, 1D

Note: Hand in your answer in two separate cover paper according to:

A = Questions 1-2

B = Questions 3-7

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1. Microorganisms multiply in a binary fashion. A culture starts with 2 cells and grows exponentially. How many generations does it take to reach 1024 cells? One generation takes 30 minutes. What is the growth rate of this culture? (1 p)
 2. The antibiotic streptomycin is a secondary metabolite produced by the fungus *Streptomyces griseus*.
 - a) Describe in a few sentences the fermentation process to produce this antibiotic. (1.5 p)
 - b) The mechanism of antimicrobial action. (0.5 p)
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3. In glycolysis, one of the following molecules gives electrons to NAD^+ . Which one is this molecule? (1 p)
 - a) Pyruvate;
 - b) Fructose-1,6-bisphosphate;
 - c) Glucose-6-phosphate;
 - d) Glyceraldehyde-3-phosphate.
 4. What is oxidative phosphorylation? Explain briefly what happens during oxidative phosphorylation. (1 p)
 5. Explain briefly what happens during Tricarboxylic Acid Cycle. Describe what kind of electron carriers and energy currency are produced. (1 p)
 6. What are the two important functions of Pentose Phosphate Pathway? (1 p)
 7. Metabolic pathways are connected in living organisms. For the following metabolic pathways, describe how the end product of one metabolic pathway enters the next metabolic pathway:
Glycolysis, Triacrboxylic Acid Cycle, Oxidative phosphorylation (1 p)