

Dugga in Technical Biology

November 12, 2012, kl 15.00-17.00, K:A

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

A = Questions 1-6

B = Questions 7-9

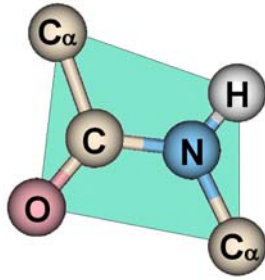
1. Mention two reasons why a microbial culture might have a long lag phase after inoculation. (1 p)
2. *Saccharomyces cerevisiae* is a facultative anaerobe commonly used as a cell factory by the industry.
 - a) Explain facultative anaerobe. (1 p)
 - b) Why is the sugar consumption enhanced when *S. cerevisiae* grow anaerobically? (0.5 p)
3. Shortly discuss why microbes in a biofilm are more resistant to environmental changes than free-floating microbes. (1 p)

Multiple Choice Quiz Section. Choose the best answer.

4. The outer membrane of Gram negative cells is more permeable than the plasma membrane because: (0.5 p)
 - A) LPS is larger than most membrane phospholipids.
 - B) the core polysaccharide spans the lipid bilayer.
 - C) porin proteins establish holes in the outer membrane.
 - D) none of the above
 5. The most important role of the prokaryotic cell wall is to: (0.5 p)
 - A) maintain the shape of the cell.
 - B) protect the cell from osmotic pressures.
 - C) prevent ions from diffusing away from the cell.
 - D) block the effects of antibiotics like penicillin
 6. Gram positive cells: (0.5 p)
 - A) have thick, homogeneous cell walls.
 - B) usually contain teichoic acids.
 - C) do not have an outer membrane.
 - D) all of the above are true.
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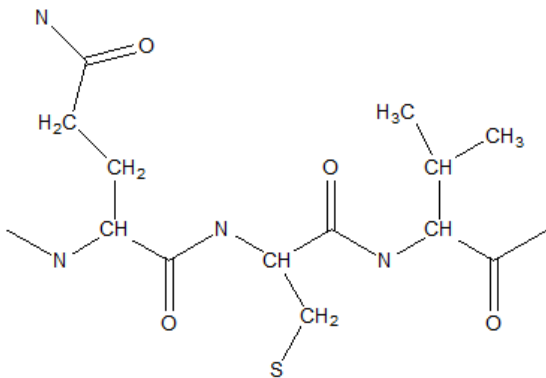
7. Explain why peptide bond has a planar structure as shown below.

(1 p)



8. X-ray crystallography yields models showing the positions of atoms such as C, N and O. Hydrogen atoms are not detected in most electron density maps and must be added back in their correct positions. Add back the missing H atoms in the polypeptide structure below:

(1 p)



9. Enzyme inhibition: in the absence of inhibitor, a plot of reaction rate versus substrate concentration for an enzyme-catalyzed reaction gives curve 1. What types of inhibition does curves 2 and 3 represent? Explain briefly how you come to that conclusion

(1 p)

