

Name (Last, First): _____

Chem 355 Test 3 Form B, Professor David L. Huffman, Monday, 3/24/2003

Questions for TEST FORM D. THIS EXAM WILL BE COLLECTED AT 12:50 PM. PAGE 5 IS FOR SCRATCH WORK. DO NOT USE YOUR OWN PAPER. COMPLETE THE SCANTRON PORTION OF THE TEST BEFORE PROCEEDING TO THE SHORT ANSWER SECTION.

Number 1 through 15 are worth 6 points each.

1. The breakdown of metabolites is called
 - A. anabolism
 - B. catabolism
2. Glycogen is a polymer of . . .
 - A. galactose
 - B. glucose
 - C. None of the above
3. The cytosol is the location for most of the reactions of . . .
 - A. glycolysis
 - B. gluconeogenesis
 - C. the citric acid cycle
 - D. A and B above
 - E. B and C above
4. Glycogen breakdown into glucose-1-phosphate requires . . .
 - A. one mole of ATP
 - B. two moles of ATP
 - C. none of the above
5. The production of lactate from pyruvate requires . . .
 - A. one mole of ATP
 - B. one mole of NADH
 - C. none of the above
6. Oxaloacetate is a component of
 - A. the malate-aspartate shuttle
 - B. gluconeogenesis
 - C. the citric acid cycle
 - D. A, B, and C above
 - E. A and B above
7. Phosphofructokinase . . .
 - A. is a rate-determining enzyme of glycolysis
 - B. is activated by citrate
 - C. is activated by ATP
 - D. A, B, and C above
 - E. A and B above
8. The pyruvate dehydrogenase complex . . .
 - A. acts on the substrate glucose
 - B. produces succinyl CoA
 - C. has lipoamide as a cofactor
 - D. A and B above
 - E. B and C above
9. Succinate dehydrogenase
 - A. is a membrane-bound enzyme
 - B. is part of the electron transport chain
 - C. is part of the citric acid cycle
 - D. B and C above
 - E. A, B, and C above
10. The primary regulatory points of the citric acid cycle include
 - A. the pyruvate dehydrogenase complex
 - B. aconitase
 - C. the α -ketoglutarate dehydrogenase complex
 - D. A and B above
 - E. A and C above
11. The pentose phosphate pathway . . .
 - A. produces glucose
 - B. produces NADPH
 - C. produces precursors for nucleotide synthesis
 - D. A and B above
 - E. B and C above
12. NAD⁺ . . .
 - A. is the reduced form of this cofactor
 - B. is the oxidized form of this cofactor
 - C. is an important cofactor in ethanol metabolism
 - D. A and C above
 - E. B and C above
13. Complex I . . .
 - A. accepts electrons from FADH₂
 - B. accepts electrons from O₂
 - C. None of the above
14. ATP synthesis . . .
 - A. is coupled to the electron transport chain
 - B. is an endergonic process
 - C. A and B above
 - D. None of the above
15. Photosynthesis . . .
 - A. converts light energy into chemical bonds
 - B. occurs in the cytosol of the plant cell
 - C. occurs in the liver of animals
 - D. A and B above
 - E. A and C above

**SHORT ANSWER PORTION OF TEST. VARIABLE NUMBER OF POINTS.
TELL ME WHAT YOU KNOW. DO NOT LEAVE ANSWERS BLANK.
PLACE YOUR ANSWER WITHIN THE BOX TO RECEIVE CREDIT**

16. Discuss regulation mechanisms of one of the following pathways. (15 points)
- Glycogen synthesis and breakdown
 - Glycolysis
 - Gluconeogenesis
 - The Citric Acid Cycle

16.

17. Discuss three metabolic fates of one of the following (15 points)
- glucose-6-phosphate
 - oxaloacetate
 - pyruvate

17.

18. Discuss one to the following topics (15 points)
- The Calvin cycle
 - Photon activation and electron flow in photosynthesis
 - The mechanism of ATP production in oxidative phosphorylation
 - Itemization of the moles of ATP produced from one mole of glucose

18.

19. Name a metabolic disease and its associated enzyme. (5 points)

19.

20. Draw the structure of glucose or fructose (5 points).

20.

21. Draw the structure of heme or cytochrome c (5 points).

21.

22. Discuss a topic of your choice from metabolism that is unrelated to your previous answers. Give at least three main points. Don't make your answer too general. (15 points)

22.

23. Discuss one of the following transport or shuttle mechanisms in detail. (15 points)

- a. the Cori cycle
- b. Malate-aspartate shuttle
- c. Glycerol-3-phosphate shuttle

23.

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**SCRATCH PAPER. THIS IS NOT A PAGE TO PLACE ANY ANSWERS.
THIS FORM MUST BE RETURNED WITH YOUR EXAM. DO NOT
DETACH.**