

**Questions for TEST FORM E. 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. Lipid bilayer cellular membrane
 - A. melting point depends on the specific lipid composition
 - B. contains lipids composed only of saturated hydrocarbons
 - C. contains predominantly polar components in the interior of the bilayer
 - D. A and B above
 - E. A, B, and C above
2. Micelles . . .
 - A. are used to solubilize exogenous lipids in the bile
 - B. are composed of lipid bilayers
 - C. are the organelles where fatty acid synthesis occurs
 - D. A, B, and C above
 - E. None of the above
3. Cholesterol . . .
 - A. needs to be eliminated from the human diet
 - B. esters carry lipids within the chylomicrons
 - C. is a saturated straight chain hydrocarbon
 - D. A and C above
 - E. None of the above
4. Which of the following statements are true?
 - A. Sugars are part of the head group of certain complex lipids
 - B. Nucleotide metabolism does not depend on amino acids
 - C. α -ketoglutarate is not crucial for amino acid metabolism
 - D. A, B, and C above
 - E. A and C above
5. An example of a peptidase is . . .
 - A. trypsin
 - B. chymotrypsin
 - C. pepsin
 - D. B and C above
 - E. A, B, and C above
6. Cyclic AMP
 - A. is important for phosphorylation cascades
 - B. activates triacylglycerol lipase via a protein kinase
 - C. concentration is dependent upon glucagons concentrations
 - D. A, B, and C above
 - E. A and B above
7. Acyl CoA synthetase. . .
 - A. is not necessary for fatty acid degradation
 - B. activates fatty acids by linking them to CoASH
 - C. uses pyrophosphate hydrolysis to drive the reaction to completion
 - D. B and C above
 - E. A and B above
8. Beta oxidation of fatty acids . . .
 - A. needs both FAD and NAD⁺ cofactors
 - B. removes butyl groups (4 C) with each subsequent round
 - C. occurs in the cytosol of the cell
 - D. A and B above
 - E. B and C above
9. Fatty acid synthesis
 - A. needs malonyl CoA
 - B. produces palmitate as the final product
 - C. occurs in the mitochondrial matrix
 - D. A, B, and C above
 - E. A and B above
10. Lipid transport in the blood
 - A. depends on the presence of lipoproteins
 - B. has no importance for cholesterol transport
 - C. occurs for both exogenous and endogenous lipids
 - D. A and B above
 - E. A and C above
11. Glutamine . . .
 - A. is not important for nitrogen metabolism
 - B. is an important neurotransmitter
 - C. is important in purine biosynthesis
 - D. A, B, and C above
 - E. B and C above
12. Ammonia . . .
 - A. is a strong acid
 - B. is needed at high concentrations in the cell
 - C. is a component of the urea cycle
 - D. none of the above
13. Which of the following statements is true?
 - A. Heme catabolism releases carbon monoxide
 - B. Gout is caused by the precipitation of urea crystals
 - C. Both are false
14. Ribonucleotide reductase . . .
 - A. reduces DNA
 - B. reduces RNA
 - C. is not necessary to make DNA
 - D. A and B above
 - E. A, B, and C above
15. Which amino acid is the immediate biosynthetic precursor of urea?
 - A. arginine
 - B. lysine
 - C. glutamine
 - D. aspartate
 - E. None of the 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. Outline the urea cycle. (15 points)

16.

17. Compare beta oxidation and fatty acid biosynthesis. (15 points)

17.

18. Discuss connectivity between metabolic pathways. Pick **only one** from the following list. (15 points)
- Fatty acid catabolism and the citric acid cycle
 - Amino acid biosynthesis and glucose metabolism
 - Heme biosynthesis and the citric acid cycle
 - Nucleotide biosynthesis and amino acids

18.

19. Tell me what you know about any metabolic disease. (10 points)

19.

20. Draw the structure of cholesterol and circle the esterification site (5 points).

20.

21. Discuss a topic of your choice from metabolism that is unrelated to your previous answers from the material you studied for test 4. Give at least three main points (15 points)

21.

22. What do the terms ketogenic and glucogenic mean? Pick a metabolite that one of terms describes and discuss how its metabolism impacts a process. (15 points)

22.

Name (Last, First): _____ Chem 355, Professor David L. Huffman, Test 4, FORM E

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