

Biochemistry 694:301
Final Exam, Deis
Mon., May 13, 2002

Name _____
Last 5 digits of SSN _____
Row Letter _____ Seat Number _____

This exam consists of two parts. Part I is multiple choice. Each of these 25 questions is worth two points. Answer the Part I questions on this sheet, below. Answer the Part II questions on the question pages.

Please use BLOCK CAPITAL letters like this --- A, B, C, D, E. Not lowercase!

- | | | |
|----------|-----------|-----------|
| 1. _____ | 10. _____ | 18. _____ |
| 2. _____ | 11. _____ | 19. _____ |
| 3. _____ | 12. _____ | 20. _____ |
| 4. _____ | 13. _____ | 21. _____ |
| 5. _____ | 14. _____ | 22. _____ |
| 6. _____ | 15. _____ | 23. _____ |
| 7. _____ | 16. _____ | 24. _____ |
| 8. _____ | 17. _____ | 25. _____ |
| 9. _____ | | |

GRADE:

Part I Total _____

Part II:

II-1 _____

II-2 _____

II-3 _____

II-4 _____

II-5 _____

Part II Total _____

Total, I & II _____

1. Glycogen Synthase lengthens the chain of glycogen by reacting with
 - A. Glucose-1-P
 - B. Glucose-2-P
 - C. Glucose-6-P
 - D. UDP-Glucose
 - E. UDP-Galactose

2. How much liver glycogen would an average person have?
 - A. 2.8 Calories
 - B. 28 Cal
 - C. 280 Cal
 - D. 2800 Cal
 - E. 28,000 Cal

3. The "remodeling" of glycogen during breakdown does *not* involve
 - A. branching enzyme
 - B. debranching enzyme
 - C. 1-6 glycosidase
 - D. transferase
 - E. any of the above

4. Complete breakdown of stearyl CoA (18:0) would yield how many high energy phosphate bonds ("ATP")?
 - A. 106
 - B. 108
 - C. 116
 - D. 122
 - E. none

5. Which condition could not lead to "ketosis"?
 - A. starvation
 - B. diabetes
 - C. running the last mile of a marathon
 - D. eating a bag of potato chips
 - E. going on the Atkins diet

6. ACP stands for
 - A. almost completely puzzled
 - B. automatic chloride pump
 - C. acyl carrier protein
 - D. amino-cysteinyl peptide

7. The function of Carnitine is
 - A. redox cofactor
 - B. one carbon carrier
 - C. help digest meat
 - D. transport fatty acids
 - E. cleave chymotrypsinogen

8. Ubiquitin is
 - A. another name for Coenzyme Q
 - B. an enzyme that breaks down proteins
 - C. a small protein marker for protein turnover
 - D. a folding chaperone

9. High levels of GOT, or Aspartate Aminotransferase in the blood serum, indicates:
 - A. brain damage
 - B. torn tendons
 - C. viral infection
 - D. heart or liver damage
 - E. PKU

10. Norepinephrine is converted into Epinephrine with the aid of
A. SAM C. THF
B. TPP D. PLP
- 11.* The compound shown below is
A. N5 methyl THF D. N5 N10 methenyl THF
B. N5 formyl THF E. N10 formyl THF
C. N5 N10 methylene THF
12. Gout and Lesch Nyhan Syndrome are both due to unusually high levels of what?
A. uric acid D. niacin
B. urea E. heme groups
C. uronate
13. Methotrexate works in chemotherapy because it
A. prevents fatty acid metabolism
B. prevents DNA synthesis
C. damages RNA
14. Restriction cleavage sites are "palindromic" -- which sequence below could be a restriction site for some enzyme?
A. GCACGCAC D. GCACACGC
B. GCACCACG E. none of the above
C. GCACGTGC
15. Taq DNA Pol is used in PCR because
A. it is inexpensive D. it works at high temperatures
B. it is not processive E. none of the above
C. it doesn't require a primer
16. pBR322, a plasmid frequently used as a vector, has resistance genes for
A. cipro and nalidixic acid D. aspirin and amanitin
B. ampicillin and tetracycline E. cocaine and alcohol
C. streptomycin and erythromycin
17. An Okazaki fragment has which structure?
A. short DNA strand D. short RNA strand
B. DNA at 5' end, RNA at 3' E. none of the above
C. RNA at 3' end, DNA at 5'
18. A supercoiled plasmid is found to have 27 right handed coils (or "twists") and 3 left handed supercoils ("writhes"). The linking number is
A. -31.5 D. +27
B. -27 E. +30
C. +24 F. +31.5

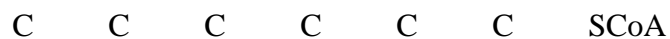
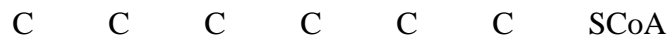
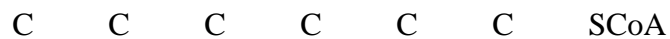
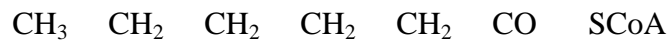
PART II Answer these questions here on the question pages.

1. a. Diagram the Glycogen Breakdown Cascade, starting with Epinephrine and ending with Glucose-1-P.

(5)

- b. Show the beta-oxidation of fatty acids -- fill in the details on the structures provided below. Don't forget to show cofactors!

(5)



you draw next step:

2. Show the cyclic portion of the Urea Cycle. Draw all reactants and products and indicate all cofactors.

(8)

- b. Show the pathway from Pro to Glu - don't bother to show cofactors or enzymes, but do draw all intermediates.

(2)

4. a. Draw a replication fork, and indicate lagging and leading strands, Okazaki fragments, etc. Name 7 enzymes or proteins required for replication in *E. coli*.

(5)

- b. Diagram the main features of a Promoter region as described in class.

(2)

- c. Explain 2 ways that Transcription terminates in prokaryotes.

(3)

5. a. Diagram the Elongation process for procaryotic translation. Be sure to name all Factors and cofactors as well as showing the ribosomes etc. as done in class. Name each step of Elongation.

(7)

- b. How is translation terminated? Show what happens when a Stop codon is reached and name all relevant factors.

(3)