Exam 1 Answers

1. a. (1) True
   b. (1) True
   c. (1) False – ice is more extensively H-bonded than liquid water

2. a. (1) polarity
   b. (3) 1 reducing end and 11 non-reducing ends
   c. (3) Disulfide bonds; oxidation; cysteine
   d. (1) Triacylglycerols (or triglycerides)

3. (2) Spontaneous clustering of non-polar solutes in water

4. (3) Water provides the driving force; its entropy increases (favored) as its contact area with solute decreases, which happens during clustering.

5. (3) It promotes forming a compact structure, since hydrophobic amino acids will cluster away from water.

6. (3) a
   b. (3) a
   c. (3) a
   d. (3) a

7. (3) C3 is the most reduced because it has the most assigned electrons.

8. a. (2) A
   b. (3) A, E
   c. (2) Gene duplication events
   d. (2) Number of sequence substitutions between the polypeptide and its predicted common ancestor (at the branch point)
   e. (2) A
   f. (2) G – all the other protein chains are equally distantly related to myoglobin

9. a. (2) Thr – Ile – Glu
   b. (4) structure:
   c. (2) peptide planes:
   d. (3) dihedral angles:
   e. (4) N-term –NH₃⁺ → 8
      C-term –COOH → 3
      Thr –OH → 13
      Glu –COOH → 4
   f. (2) 2-5, 7-9, 12-14

10. (12)

11. a. (1) True
    b. (1) True
    c. (1) True
    d. (1) False

12. (2) L-galactose

13. (2) d

14. (3) c

15. (4) b, d, e