- 2. Name 6 of the 9 different biological functions of proteins. (12 points)
- 3. Place the following amino acids next to the appropriate labels below by writing out their full names: gly, trp, thr, asn, his (10 points)

nonpolar side chain -

(6 points)

polar neutral side chain -

polar acidic side chain –

polar basic side chain –

- 4. What is meant by *native* protein? (3 points)
- 5. Pure alanine does not melt, but decomposes at 290 °C. In contrast, the ethyl ester of alanine melts at only 87 °C. Explain the large difference in melting points. (5 points)

6. Draw the structures of the products that form when the following polypeptide is completely digested. (8 points)

- 7. What does the prefix "glyco-" refer to in "glycoprotein?" (4 points)
- 8. Name each level of protein structure and describe the nature of that structure. (12 points)

9. Explain the roles of mRNA and tRNA in protein synthesis. (10 points)

10. Draw the structure of the guanine DNA nucleotide. (10 points)

- 11. What is a codon, and what kind of nucleic acid is a continuous, uninterrupted series of codons? (6 points)
- 12. The base sequence along one strand of DNA is ATTCG. What would be the sequence on the complementary strand of DNA? (4 points)

13. In DNA replication, a parent DNA molecule produces two daughter molecules. What is the fate of each strand of the parent DNA double helix? (5 points)

- 14. Why is structurally important in the DNA double helix that a purine base always pair with a pyrimidine base? (5 points)
- 15. With respect to genetic material, how does a virus differ from a cell? (4 points)