

**BC 367
Exam 1
October 8, 2009
Answer Key**

1. D
2. E
3. E
4. C
5. B
6. D
7. B
8. B
9. D
10. D

11. a) **A**
b) **B**
c) Peptide A contains no aromatic amino acids, so it has no A_{280} .
d) **C**
e) **C**

12. d, e, g collagen a, c keratin b silk fibroin

13. a) **NaH₂PO₄** (its pKa of 7.21 is the closest to the desired pH), **NaOH** (need to produce the conjugate base)

- b) Need 0.10 moles of the acid.
0.1 mol x 138 g/mol = **13.8 g NaH₂PO₄**

Solve Henderson-Hasselbach to determine how much A⁻, and thus NaOH, is needed.

$$\text{pH} = \text{pKa} + \log \frac{[\text{A}^-]}{[\text{HA}]}$$

$$7.5 = 7.21 + \log \frac{[\text{A}^-]}{[\text{HA}]}$$

$$\frac{[\text{A}^-]}{[\text{HA}]} = 1.95 \text{ or } [\text{A}^-] = 1.95[\text{HA}]$$

$$\text{Also know that } [\text{A}^-] + [\text{HA}] = 0.1 \text{ M}$$

$$2.95 [\text{HA}] = 0.1 \text{ M or } [\text{HA}] = 0.034 \text{ M, so } [\text{A}^-] = 0.066 \text{ M}$$

Add 66 mL NaOH, H₂O to 1.0 L

14. **Gly-Gly-Phe-Met-Leu-Arg-Phe-Gly-Trp-His**

15.

	gel filtration	gel filtration	SDS-PAGE	SDS-PAGE
	Normal GDNF	Variant GDNF	Normal GDNF	Variant GDNF
No β -mercaptoethanol	30,000	30,000	30,000	15,000
With β -mercaptoethanol	30,000	30,000	15,000	15,000

b) *Wnc* interactions keep the two subunits together despite the destruction of the covalent disulfide bond. (This can be inferred from the ultracentrifugation results as well as the data.)

c) **peptide bonds, 1° structure, net negative charge**

d) **similar 3° structure, homologs, orthologs**

16.

a) **Lysine**

b) **A, C, E**

c) **D**

d) **A, C, E**

e)

