Homework #3

1. Stock Solution of Lysozyme: $\dfrac{10 \cancel{ml} \times 50 \text{ mg}}{1 \quad \cancel{ml}} = 500$ mg or 0.5 g of lysozyme

Dissolve 0.5 g of lysozyme in about 5 ml of TE. Once dissolved, dilute the stock solution to 10 ml with TE in a graduated cylinder.

For your protein purification: $\dfrac{10 \cancel{mg} \times 1 \text{ ml}}{1 \quad 50 \cancel{mg}} = 0.2$ ml of 50 mg/ml lysozyme

In my protein purification, I would add 0.2 ml or 200 µl of 50 mg/ml lysozyme.

2. 1x Tris-glycine

Tris: $\dfrac{1.0 \cancel{L} \times 25 \cancel{mM} \times 1 \cancel{Mole} \times 121.4 \text{ g}}{1 \quad \cancel{L} \quad 1000 \cancel{mM} \quad \cancel{Mole}} = 3.04$ g of Tris

For 5X: 3.04 g of Tris x 5 = 15.2 g of Tris

Glycine: $\dfrac{1.0 \cancel{L} \times 250 \cancel{mM} \times 1 \cancel{Mole} \times 75.07 \text{ g}}{1 \quad \cancel{L} \quad 1000 \cancel{mM} \quad \cancel{Mole}} = 18.77$ g of Glycine

For 5X: 18.77 of Glycine x 5 = 93.85 g of Glycine

SDS: 0.1 % = $\dfrac{0.1 \text{ g}}{100 \text{ ml}}$

$\dfrac{1.0 \cancel{L} \times 1000 \cancel{ml} \times 0.1 \text{ g}}{1 \quad \cancel{L} \quad 100 \cancel{ml}} = 1$ g of SDS

For 5X: 1.0 g of SDS x 5 = 5.0 g of SDS

Dissolve 15.2 g of Tris, 93.85 g of Glycine and 5.0 g of SDS in about 500 ml of water. Once dissolved, dilute the stock solution to 1.0 L or 1000 ml in a graduated cylinder.

3. 1x Tris-glycine from 5x:

$$C_1V_1 = C_2V_2$$

$$(5x) \times V_1 = (1x) \times 1.0 \text{ L}$$

$$V_1 = \frac{(1\cancel{x}) \times 1.0 \text{ L}}{(5\cancel{x})}$$

$$= 0.2 \text{ L or 200 ml of 5x Tris-glycine buffer}$$

Dilute 200 ml of 5x Tris-glycine buffer to 1.0 L with H_2O in a graduated cylinder to make 1x Tris-glycine buffer. (Also, you could say 200 ml of Tris-glycine plus 800 ml of H_2O.)

4-8 Check your Biochemistry book for 3 and 1 letter codes of the amino acids.

4. Glycine, Alanine, Valine, Leucine, Isoleucine, Methionine, Proline, Phenylalanine and Tryptophan
5. Same as #4
6. Lysine and Arginine
7. Serine, Threonine, Asparagine, Glutamine, Tyrosine, Cysteine, Lysine, Arginine, Histidine, Aspartic Acid, Glutaminc Acid
8. Aspartic and Glutamic Acid