BICH 462a ANSWERS **NAME (printed LEGIBLY!)**_____
QUIZ #4B (20 points) Nov. 30, 2007 **Section no./T.A.name** _____

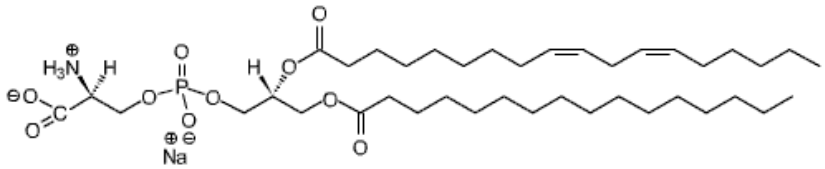
NO CALCULATORS ARE PERMITTED ON THIS QUIZ.
CIRCLE ONLY 1 ANSWER PER QUESTION. (Please put in folder on back table.)

1. **(3 pts)** Which of these sequences is most likely to form a single membrane spanning α-helix?

A. GLKMEFDGGTSMGHILLEDL
B. HIDETHEFILMCHSERDKTY
C. REDRKITFDGVLERGILDFW
***D. WLVMFLIAILAVTMLIAFLY**
E. HGISDETRGHLICVHIATYP

2. **(2 pts)** Which name correctly describes the molecule shown at right?

A. glycosphingolipid
B. phosphosphingolipid
C. 18:2($\Delta^{6,9}$) fatty acid
D. triacylglycerol
***E. phosphatidylserine**



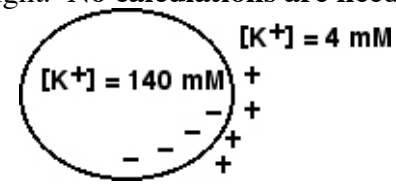
3. **(2 pts)** Which fatty acid has the HIGHEST melting point?

A. 18:2 D. 18:1 ***G. 18:0**
B. 16:2 E. 16:1 H. 16:0
C. 14:2 F. 14:1 I. 14:0

4. **(3 pts)** For movement of an uncharged solute from one compartment to another, the free energy change is given by $\Delta G_t = RT \ln \frac{C_2}{C_1}$, where C_1 and C_2 are the concentrations of the solute in compartments 1 and 2 respectively. In which direction will solute move when ΔG_t is negative?

A. from compartment 2 to compartment 1
***B. from compartment 1 to compartment 2**
C. the system is at equilibrium, thus no net movement
D. not enough information to determine

5. **(4 pts)** Suppose that for a K^+ ion, the intracellular concentration is 140 mM and the extracellular concentration is 4 mM. The transmembrane potential ($\Delta\Psi$) is –0.06 V, inside negative relative to outside. The free energy change for movement of K^+ out of the cell is $\Delta G_t = RT\ln(C_2/C_1) + ZF\Delta\Psi$.
Answer the following questions based on the sketch shown below right. **No calculations are needed.**



A. (2 pts) Does the chemical potential term favor movement of K^+ out of the cell? no ***yes**

B. (2 pts) Does the electrical potential term favor movement of K^+ out of the cell? ***no** yes

6. **(3 pts)** A transporter reduces the $\Delta G^{\ddagger}$ for diffusion of polar molecules through a lipid bilayer by

***A. providing multiple weak interactions with the dehydrated solute to replace the hydrogen bonding with water.**
B. increasing the rate of desolvation of the ion.
C. providing a tight binding site for the dehydrated solute.
D. orienting the solute.
E. providing a nonpolar channel with no specific interactions so as to increase diffusion rates.

7. **(3 pts)** A passive symporter transports

A. a single substrate down its concentration gradient.
B. two substrates in opposite directions across a membrane down their concentration gradient.
***C. two substrates in the same direction across a membrane down their concentration gradient.**
D. two substrates in the same direction across a membrane by using energy from the flow of H^+ or Na^+ down their concentration gradient.
E. two substrates in the same direction across a membrane up a concentration gradient.