BCHM461 Graded Quiz #1 (20 points) **Due date/time: Wed Sept 23, 2026 by 11:59pm**

This is graded quiz #1. It contains two problems, 20 points total. You can type/paste your answers directly in the textbox on ELMS or upload scanned copies of your answers. If the latter, before uploading your work to ELMS please make sure all scanned/photocopied material has good resolution and is readable both on your computer and in ELMS. If the uploaded material is unreadable it will not be graded.

Problem 1. Consider a hypothetic reaction A $\rightleftarrows$ B that takes place at 25°C. The reaction started with 250 mM of compound A and no B. Five minutes after the reaction started, the molar concentration of A dropped to 100 mM, and the ΔG for the forward reaction at this time point was -3 kJ/mol. Answer the following questions.

(A) Determine the value of ΔG^{o} for the forward reaction.

(B) Determine the equilibrium constant for the forward reaction.

(C) Determine the final molar concentration of B.

Problem 2. You need to prepare 200 mL of 50 mM acetate buffer with pH 5.2. You do this by mixing pre-calculated amounts/volumes of acetic acid and sodium acetate with pure water. Calculate how many milliliters of 1M acetic acid and 1M sodium acetate you need for this.