BIOB10 Fall 2025 – Sample Questions for Final Exam

1. How is it that proteins possessing different kinds of nuclear localization signals (NLSs) can be efficiently transported into the nucleus through nuclear pore complexes (NPCs)?

   A) The NPC can bind various NLSs through its unstructured FG-repeat domains.
   B) There are specialized NPCs that bind each of the different classes of the NLSs.
   C) Different import receptors recognize different NLSs and then interact with NPCs.
   D) Proteins with different NLSs travel through different sub-channels within NPCs.

2. Which of the following correctly describes the sequence of steps in the calnexin cycle during the quality control of N-linked glycoprotein folding in the endoplasmic reticulum?

   A) Glucosidase I removes one glucose → Glucosidase II removes the second glucose → Calnexin binds the diglucosylated glycoprotein → UGGT removes mannose residues to retain the protein in the ER.
   B) Glucosidase I removes one glucose → Glucosidase II removes the second glucose → Calnexin binds the monoglucosylated glycoprotein → Glucosidase II removes the final glucose once properly folded → If misfolded, UGGT adds back a glucose residue to restart the cycle.
   C) Calnexin binds the fully glycosylated glycoprotein immediately after transfer → Glucosidase I removes all three glucose residues → UGGT adds glucose residues →