1. (50 points) A January 30, 2018 USA Today article titled “Immigration, infrastructure top Trump’s State of the Union initiatives” began with the following:

Major initiatives Trump outlined in his first State of the Union address Tuesday night include rebuilding the nation's dilapidated infrastructure and limiting the flow of immigrants who compete with American workers for jobs. “Together, we can reclaim our building heritage,” the president said. “We will build gleaming new roads, bridges, highways, railways, and waterways all across our land. And we will do it with American heart, American hands, and American grit.”

Both proposals can be measured in the billions. The president wants to spend $200 billion rebuilding roads, bridges, airports, railways, and water projects. The money would be used to generate federal, state, local and private resources totaling at least $1.5 trillion over the next decade. At the same time, Trump proposes spending $25 billion on immigration, including $18 billion for his prized but elusive wall along the Mexican border. The remainder would be used for new immigration and Border Patrol agents and technology on both the nation's borders.

You have been hired as a winter intern at the Congressional Budget Office (CBO), and on your first day of work your boss calls you into her office to discuss the links between infrastructure and immigration. Now that the midterm elections are over, she expects that infrastructure may be back on the table. And she wonders whether the President might have been on to something when he linked infrastructure and immigration in his State of the Union address. But she thinks he has the sign of this link wrong: according to her thinking, greater investment in infrastructure and more openness to immigration, not less, may go hand in hand to minimize the economic disruptions that would occur with either alone. She asks you to check her logic by using the Specific Factors Model and the Heckscher-Ohlin Model to answer a few questions. In answering these questions, you can assume that the US is a small open economy, trading freely with the large rest of the world and importing Manufactures and exporting Food, and that investment in infrastructure can be modeled as an increase in the US capital stock.

a) Assuming that in the short run the US economy can be represented by the Specific Factors Model, with Manufacturing-specific capital, Food-specific land, and with labor mobile between sectors, show that in the short run US land-owners would be hurt by infrastructure investment alone, but that if infrastructure investment were combined with the right amount of foreign labor immigration into the US, the real incomes of both US landowners and US labor could be left unchanged in the presence of the infrastructure investment in the short run. Hint: For the Specific Factors Model, you may assume that the added capital associated with infrastructure investment shifts up the MPP of labor curve in the Manufacturing sector.

b) Assuming that in the long run the US economy can be represented by the Heckscher-Ohlin Model, with Food the capital intensive good and Manufactures the labor intensive good, both of which the US produces, show that in the long run the US “industrial mix” (i.e., the ratio of Food production to Manufacturing production in the US) would have to adjust in the presence of infrastructure investment alone, but that if infrastructure investment were combined with the right amount of foreign labor immigration into the US, the US industrial mix need not change at all in the long run.
2. (30 points) In the US debate over immigration reform, there is some discussion of whether the US could benefit from a more selective immigration policy, in which potential immigrants with certain kinds of skills are given priority for entrance into the US. Using the Continuum-of-Goods Ricardian Trade Model, with the Home country representing the United States, and assuming that foreign workers who are employed in a given foreign industry \( z \) would bring knowledge of industry \( z \)'s foreign technology with them (and with this knowledge, help reduce the US unit labor requirement for that \( z \)) if they were allowed to emigrate to the US, show that the impact of immigration into the US could have different consequences for the real US wage depending on what industries (which interval of \( z \)'s) the foreign workers were originally employed in before they emigrated to the US. Hint: To answer this question, you can assume that, whatever interval of \( z \)'s the foreign workers come from when they emigrate to the US, the impact of the immigration is to improve US technology (reduce US unit labor requirements) for those \( z \)'s but not cause the \( A(z) \) curve to slope upward over any interval of \( z \)'s in \([0,1]\).

3. (20 points) The New York Times ran an article a few years ago with the headline “Falling Wages at Factories Squeeze the Middle Class.” The article begins with:

For nearly 20 years, Darrell Eberhardt worked in an Ohio factory putting together wheelchairs, earning $18.50 an hour, enough to gain a toehold in the middle class and feel respected at work.

He is still working with his hands, assembling seats for Chevrolet Cruze cars at the Camaco auto parts factory in Lorain, Ohio, but now he makes $10.50 an hour and is barely hanging on. “I’d like to earn more,” said Mr. Eberhardt, who is 49 and went back to school a few years ago to earn an associate’s degree. “But the chances of finding something like I used to have are slim to none.”

It may seem puzzling that this drop in US manufacturing wages, which likely reflects increased trade pressures faced by US firms, is occurring now, when US tariffs have been low for some time. Use the 2-good 2-country Ricardian trade model and the 2-good 2-factor 2-country Heckscher-Ohlin model to argue that the increasing flow of technology across countries can help resolve this puzzle. Specifically, please do the following:

a) First, use the Ricardian model and show that, in a world of free trade and with the US producing both goods, the US wage would remain higher than the foreign wage as long as the US technology exhibits an absolute advantage in the good that is also produced by the other (foreign) country.

b) Second, use the Heckscher-Ohlin model and show that, in a world of free trade where the US is the capital abundant country and with both countries producing both goods, the US wage will become equal to the foreign wage if the US absolute advantage is eroded and technologies are the same across countries as the Heckscher-Ohlin model assumes.

c) Finally, using the Heckscher-Ohlin model and again assuming the US is the capital abundant country, show that a US tariff would raise Mr. Eberhardt’s real wage.

Extra Credit (5 points) Pose a question on a trade policy topic that your grandmother might ask you at the Thanksgiving dinner table this Thursday, and provide an answer that is supported by the models we have covered in Econ 39F this Fall but that is translated into words and intuitive explanations that your grandmother could appreciate without having taken Econ 39F herself.