Mid-Term Examination

NAME: ___________________________________________

In AGEC 640, we use economic models to analyze the causes and consequences of agricultural policy. This midterm exam asks you to apply some of the most important stylized facts and analytical methods from the first part of this class. Each answer should fit into the space provided, but if you prefer you can continue to write in the margins or on the back of each sheet.

PART A. STYLIZED FACTS FOR AGRICULTURAL POLICY ANALYSIS

1. Short answer questions.

1. AGEC 640 uses economic models to explain peoples’ choices and analyze policy changes. For the purposes of this class, what are the key fundamental features of this economics approach?

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2. As societies develop and earn higher incomes per capita, what happens to the share of income and employment in each of the three major sectors (agriculture, industry and services)?

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3. Looking within agriculture, as societies develop, in what ways does farming itself become “industrialized”? In what ways do (or don’t) farms become like factories?

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2. Drivers of change: the demographic transition

The charts above show population by age groups in 1980, for countries at three levels of income: low (Nigeria), middle (Indonesia) and high (USA). On top of each, please draw what happened next by sketching the approximate “population pyramid” as it looked 20 years later (in 2000). Then, for each country, describe what caused the pyramid to change in that way:

2.1 In Nigeria..._________________________________________________________________
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2.2 In Indonesia…_______________________________________________________________
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2.3 In the USA…_______________________________________________________________
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3. **Drivers of change: structural transformation and the number of farmers**

In the space above, please sketch three lines showing the approximate time path of the number of people in the United States who are: (a) workers of any type, (b) workers employed off-farm, and (c) farm workers. Please draw the lines as carefully as you can. Then, for each line, please describe what caused the number of workers to change in that way:

(a) The total number of workers…

(b) The number of workers employed off-farm…

(c) The number of farm workers…
PART B. ECONOMIC ANALYSIS OF POLICY EFFECTS

4. The farm household model of production
Economists try to explain peoples’ choices, and predict how they will respond to change. Each of the charts below shows an observation from a recent farm survey: the diamond is a typical farmer’s production of corn (in metric tons) and use of labor (in hours), the star is their corn production versus their production of beans (also in metric tons), and the triangle is their use of human labor versus horsepower (in hp).

The points above are simply observations. Now we must build a model to explain those observations, and predict how this farm household might respond to a change in circumstances.

4.1 In addition to the points shown, what other combinations of outputs and inputs do you think could be observed? Please sketch solid lines (or curves) to show those other combinations on each chart.

4.2 If this farm were trading everything freely with a large rest of the world, what could explain why they are producing at the observed points, instead of other points along the lines you drew? Please draw dashed lines (or curves) to show any other information that might be needed to explain the observed points on each chart.

4.3 Now imagine that events in the rest of the world cause the price of corn to rise, without changing the prices of anything else. How do you predict that your farmer’s production might change? Please draw any new lines (or curves) needed to explain the change you predict, and draw a square around the new point of production and a circle around the new point of consumption.
5. The farm household model of production, consumption and marketing

Please start this section by re-drawing your answer to questions 4.1 and 4.2. To avoid clutter, please do not redraw your answer to 4.3. As before, there is no need to label the lines.

The curves or lines drawn above offer an economic explanation for a farmers’ production. Now you continue the survey after harvest to ask about consumption. What you find is that she has sold some of the beans so as to buy more corn. (This is typical of many extremely poor farmers, who grow an inexpensive starchy staple and also produce higher-value crops for sale, to earn cash which they often spend on buying even more of the cheapest available food.)

5.1 On the middle diagram, draw a large dot showing the combination of corn and beans that this farmer has chosen to consume.

5.2 Briefly explain what determined the slope of the line that links the star and the dot you drew. Why must the dot be along that line? ________________________________________________
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5.3 In addition to the dot you drew, what other combinations of corn and beans do you think this farmer would be equally willing to consume? Please sketch a dotted line through those points.

5.4 Now return to question 4.3: if events in the rest of the world cause the price of corn to rise, how do you predict that your farmer’s production and consumption might change? Please draw any new lines (or curves) needed to explain the change you predict, and draw a square around the new point of production and a circle around the new point of consumption.

5.5 Has the farmer’s well-being improved or worsened? Briefly explain how you know.
6. Adding up households: supply, demand and markets

A given region consists of many households, and the diagram below is intended to show the sum of all the quantities produced, consumed or traded at each price, by all households in a region.

6.1 Adding up quantities produced by each household in our region, please draw a supply curve and a demand curve, defined as the total quantity produced and consumed at each price.

6.2 Imagine that our region consists of a few thousand households that are, by coincidence, exactly like the farmer in question 5. (In other words, that household is “a representative household” for this region.) Please draw a square around the point on the supply curve showing the region’s total production, and a triangle around the point on the demand curve showing total consumption, then draw a dashed line between these two points.

6.3 Briefly explain what determined the position of the dashed line that links the square and the triangle. Why is that line where it is? ____________________________________________________________
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6.4 Now again return to question 4.3: if events in the rest of the world cause the price of corn to rise (but nothing else changes) how will this region’s production and consumption change? Please draw any new lines (or curves) needed to explain the change you predict, and draw a circle around the new point of production and a star around the new point of consumption.

6.5 Has the region’s welfare improved or worsened? Use letters or shading on the diagram to illustrate the magnitude of gains or losses, and briefly explain how this loss or gain is defined. ____________________________________________________________
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