ECO 375 **Name (Print):** _____
Fall 2018
Midterm Exam 1
10/4/2018
Time Limit: 75 Minutes

This exam contains 8 short answer questions, 1 longer answer question, and 2 long answer questions. You must complete all short answer and longer answer questions; however, you only need to complete 1 of the long answer questions. Check to see if any pages are missing.

You may *not* use your books or notes on this exam. Calculators are permitted.

You are required to show your work on each problem on this exam. The following rules apply:

- **Organize your work**, in a reasonably neat and coherent way, in the space provided. Work scattered all over the page without a clear ordering will receive very little credit.
- **Show your work**. A correct answer, unsupported by calculations, explanation, or algebraic work will receive no credit; an incorrect answer supported by substantially correct calculations and explanations might still receive partial credit.
- If you need more space, use the back of the pages; clearly indicate when you have done this.

Multiple Choice: Circle the correct answer.

1. (5 points) The empirical relationship between trade and growth is:
   A. strong.
   B. weak.
   C. strong for natural resource-based exports only.
   D. nonexistent.

2. (5 points) Which indicator is inversely related (meaning that it falls as per capita income rises) to per capita income?
   A. adult illiteracy rate
   B. infant mortality rate
   C. share of the population living in rural areas
   D. all of the above

3. (5 points) While there is no evidence of absolute convergence, there is strong evidence today of conditional convergence in which:

   A. countries sharing certain characteristics are able to achieve rapid growth and begin to catch up with the richer countries.
   B. by entering into the WTO, a nation agrees to integrate into the global economy.
   C. countries all agree to play by "the rules of the game."
   D. countries considered at the most advanced stage of capitalism begin to decline, while developing nations accelerate past the,.

4. (5 points) If a country achieves a rapid increase in per capita income by discovering new oil reserves, it is experiencing:

   A. growth but not development.
   B. development but not growth.
   C. both growth and development.
   D. neither growth nor development.

5. (5 points) Most economists agree that an effective way of comparing income levels between countries around the world is through the use of:

   A. employment statistics.
   B. GDP per capita.
   C. GNI.
   D. purchasing power parity.

6. (5 points) In the Solow model, investment comes from:

   A. FDI and savings.
   B. the government.
   C. saving.
   D. the capital stock.

7. (5 points) The Solow Neoclassical Growth model assumes all of the following expect:

   A. diminishing returns to capital
   B. constant returns to scale
   C. Δk is positively related to the savings rate, and negatively related to the depreciation rate of capital and the population growth.
   D. Savings yields investment.

8. (5 points) Growth depends on which two processes?

   A. accumulation of assets and making those assets more productive
   B. harnessing natural resources and marketing them to developed nations at a "fair trade" rate
   C. exploitation of the agricultural sector in order to advance industrialization
   D. engaging in free trade while subsidizing domestic agricultural and industrial production

Longer Answer Question: Please answer the following. Be sure to label any graphs.

1. (30 points) Assume that Cohleland, a developing country, has a growth rate of 10%. In four years time, the income per capita in Cohleland will be equal to 70.

   (a) (5 points) Using the function for compound growth over discrete time, what is current level of income per capita in Cohleland?

   (b) (10 points) What is a major problem with using just the initial income per capita and current level of income per capita to calculate a country's growth rate?

   (c) (15 points) Now, assume you do not know the growth rate of Cohleland. Also, assume that you want to use the least square regression method with the equation from part a to find the growth rate of Cohleland. What other information would you need about Cohleland to find an accurate growth rate? Show that the growth rate is equal to $r = e^m - 1$, where m is the slope of the regression line.

Long Answer Questions: Please answer the following. Show all work. Draw graphs where needed. Only answer 1 of the 2 questions.

1. (30 points) Zackland, a developing country, can be described using the Harrod-Domar Model.
   (a) (15 points) Using the ICOR of Zackland, 0.8, the equation for change in capital from the Basic Growth Model, and the definition of the capital output ratio ($v = \frac{K}{Y}$), prove that the growth rate is: $g = \frac{10s}{8} - d$.

   (b) (15 points) Assume that the economy is stable. In other words, population growth is such that there is never any unemployment or underutilized capital. Also, consumers save 20% of their income, and the depreciation rate of capital is 0.1. Finally, $K = 100$. What are the growth rate, g, and the population growth rate, n, in this situation?

2. (30 points) Suppose Freedonia has a national production function that is defined as: $Y = 50 * L^{\frac{1}{3}} K^{\frac{2}{3}}$. Also, there is 50 units of capital in the Freedonia and 100 people. Use the Solow model to answer the following questions. Each year, Freedonia's total income grows at a constant 5%.

   (a) (10 points) What is the current level of total income per capita in Freedonia? Also, find the new level of total income per capita in Freedonia after a year.

   (b) (10 points) Let $w_L = .8$. Also, the growth rate of labor and the growth rate of capital are both equal to 2%. Find the Solow Residual.

   (c) (10 points) Draw a graph with capital per worker on the x-axis and output per worker on the y-axis. Label an initial point on the curve as A. Now, show where the economy might be if there is a decrease in technology nationwide. Label the new equilibrium point B.

Extra Credit: Doodle.