Attention: *Not all questionnaires are the same. This is questionnaire* **A**. *On the answer sheet, you must indicate the letter of your questionnaire with the course's number as follows:* **ECO2143A**. *You must answer according to* **the material seen in this course**. *Read all answer choices before choosing your answer. Calculator permitted.* GOOD LUCK!

QUESTIONNAIRE A

I. MULTIPLE CHOICE QUESTIONS (3 points each)

1. Assume that China's GDP grows at a rate of 8% annually, and the USA's at 2.5%. Suppose that in 2010 the GDP of the two countries were 6 trillion and 14 trillion respectively. At these growth rates, in what year can we expect to see China's GDP equal that of the USA?
   (a) 2054
   (b) 2026
   (c) 2020
   (d) 2042
   (e) 2035

2. Which of the following statement is clearly <u>FALSE</u>?
   (a) Life expectancy in many developing countries has gone up significantly over the 20th century.
   (b) Over the past 10 years or so, many African countries have experienced high growth rates.
   (c) The Human development Index is correlated with per capita income levels.
   (d) Over the last 200 years or so, inequalities between citizens of the world have increased.
   (e) Throughout human history, there has always been very large per capita income inequalities between countries of the world.

3. Which of the following is clearly <u>FALSE</u>?
   (a) When one looks at the data since 1950, the theory of convergence applies quite well to the experience of today's richer (OECD) countries.
   (b) When one looks at the data since 1960, the theory of convergence does not apply so well to the experience of African countries.
   (c) When one compares the standards of living between individuals living in Europe just before the beginning of the industrial revolution (early 1700s) to that of those who lived in Rome one century A.D., they are roughly the same.
   (d) According to the *Law of one price*, given the market exchange rates, a haircut should cost about the same in India and in Canada.

4. A study has estimated the quantity of capital per worker in Mexico to be worth 42 991$(US2000), while that of India is worth 6 270$(US2000). Which property of the national production function allows us to anticipate that an additional unit of capital will have a larger impact on production in India than in Mexico?
   (a) If capital increases, output increases.
   (b) The marginal product of capital is decreasing.
   (c) Constant returns to scale.

   (d) An efficient use of capital.

   (e) capital depreciation.

5. A country is described by the Solow model with $y = k^{1/3}$. The fraction of output invested is 30% and the depreciation rate is 10%. Suppose that $y = 3$ in the present period. Which of the following is true?

   (a) Income per capita will be lower in the next period.

   (b) Income per capita will be higher in the next period.

   (c) Given the parameter values, output $y = 3$ is not possible.

   (d) The Solow model cannot explain changes in income over time.

6. Suppose that physical capital and labor are the only two production factors. The assumption of constant returns to scale implies that

   (a) if the amount of capital doubles but the amount of labor is constant, then total production doubles.

   (b) if the amount of labor doubles but the amount of capital is constant, then total production doubles.

   (c) if the amount of capital doubles but the amount of labor is constant, then total production less than doubles.

   (d) if both the amounts of capital and labor double, then total production doubles.

   (e) if both the amounts of capital and labor double, then total production less than doubles.

7. Assume that the GDP/capita for the country of Coronado in 1950 was $10,000. By 2000, the GDP/capita of this country was $25,000. Using the yearly average growth rate of income per capita over this period, what is the projected GDP/capita of Coronado in 2020?

   (a) 36,071$/capita

   (b) 43,906$/capita

   (c) 48,769$/capita

   (d) 31,239$/capita

   (e) None of the above is anywhere close to the projection.

8. Which of the following is clearly <u>FALSE</u>?

   (a) Over the past 100 years or so, the yearly growth rate of per capita income in Japan has never exceeded that of the USA.

   (b) For the USA, the yearly growth rate of income per capita in the past 130 years or so has averaged around 1.8%.

   (c) Between 1820 and today, the inequality levels within countries of the world has remained rather stable.

   (d) Over the past 10 years or so, African countries make up about half of the top performers in the list of world countries with the highest per capita growth rates.

   (e) In terms of goods that are traded in world markets, the price of goods that are not traded tends to be higher in rich countries compared to poor countries.

9. Suppose that there are only three goods produced in the world: (pairs of) warm boots, hockey games and beaver tails.[1] Warm boots are traded on world markets but not hockey games and beaver tails. The following table provides information about <u>aggregate</u> output quantities and unit prices for countries A and B. (Prices and quantities for boots refer to pairs.)

---

[1]A beaver tail is a delicacy sold at your corner frozen canal. Warm boots make the frozen canal more enjoyable. A hockey game is a sport derived from an accidental cross-pollination between soccer and boxing.

Country	boots output total (million)	hockey games output total (million)	beaver tails output total (million)	price boots (local currency)	price hockey game (local currency)	price beaver tail (local currency)
A	4	8	2	3$A	4$A	2$A
B	2	5	3	2$B	1$B	1$B

An international statistical agency considers that a typical consumption basket in both countries is composed of 1 pair of warm boots, 5 hockey games and 2 beaver tails. Determine the PPP exchange rate between the two currencies.
(a) 0.333$A/$B
(b) 1$A/$B
(c) 1.5$A/$B
(d) 2$A/$B
(e) 3$A/$B

10. In question 9, let $(Y_A/Y_B)_{EX}$ denote the GDP ratios between countries A and B using the market exchange rate and $(Y_A/Y_B)_{PPP}$ be the GDP ratio using the PPP exchange rate. By what percentage will the GDP ratio $[(Y_A/Y_B)_{EX} - (Y_A/Y_B)_{PPP}]/(Y_A/Y_B)_{PPP}$ between country A and country B be mis-estimated if one uses the market exchange rate instead of the PPP exchange rate?
(a) Underestimated by 50%.
(b) There is no difference.
(c) Overestimated by 100%.
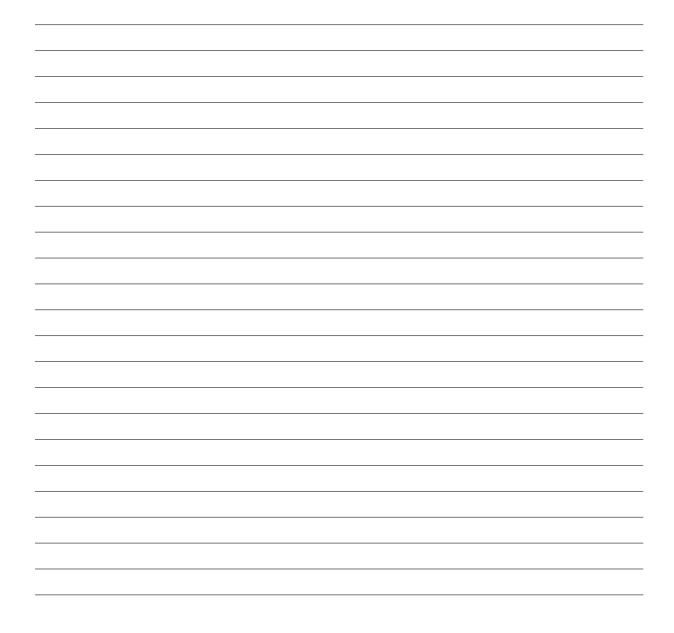(d) The GDP cannot be calculated without data on income levels.

NAME AND ID:

II. PROBLEM

You must answer the following questions within the space provided. Your answers must be accompanied with clear explanations. Graphs and equations without explanations will not get you far.

1. The Solow model (35 points)

a) (20 points) A country is described by the Solow model with a per-capita production function of $y = k^{1/3}$. (All variables are as described in class.) Suppose that today, k is equal to 600. The fraction of output invested is 30% and the depreciation rate of capital is 2%. How does the output per worker today compare with the steady-state one? Justify your answer with complete and clear explanations and mathematical derivations.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

b) (15 points) Suppose that the national production function for the Canadian economy can be expressed as $Y = AK^\alpha L^{1-\alpha}$, where each variable is as described in class. Explain how one could estimate the value of parameter α for Canada. Be as complete as possible while remaining clear and concise.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____