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 (2 points each)

1. Over the past 30 years or so, China has experienced very high growth rates. Which of the following statement is clearly <u>not</u> consistent with the prediction of the Solow model?
   (a) The fact that rich countries such as Canada and the USA have lower growth rates than China can be explained by the fact that there are decreasing returns to capital per worker.
   (b) As those high growth rates persist into the long run, there is no doubt that China will overtake the USA in terms of output per worker.✓
   (c) China's high growth rates can be explained by the fact that its capital stock per worker is much smaller than its steady-state stock level.
   (d) China's growth rate is likely to decrease as it converges to a steady-state level of its capital stock per worker.
   (e) All of the above are consistent with the predictions of the Solow model.

2. Suppose that a country experiences a large reduction in its capital stock, say due to the effect of a military conflict that has just ended. Assume no other effect from this event on the economy. Within the context of the basic <u>Solow model</u> (without technological growth), which of the following will occur as the economy adjusts to this situation (all in per capita terms)?
   (a) Zero growth for some time, followed by a gradually increasing growth rate.
   (b) High growth for some time, followed by slow but sustainable growth in the long run.
   (c) Low growth for some time, followed by slow but sustainable growth in the long run.
   (d) Some growth for some time, followed by zero growth in the long run. ✓
   (e) Positive growth, followed by negative growth, and then zero growth.

3. Which of the following is *clearly* FALSE?
   (a) For classical economists living in the early 1800's, land is the most important factor of production (other than labor).
   (b) For many development economists in the 1940s and 1950s, capital accumulation was the key to economic development.
   (c) The concentration of development aid efforts towards capital accumulation is considered a very successful strategy.✓
   (d) Today, education is considered to play an important role in explaining development.
   (e) Today, "women empowerment" is considered to be an important element in the development strategy of a poor economy.

4. Take the following identity representing the GDP in terms of aggregate expenditure shares: $Y_t = C_t + I_t + G_t + NX_t$. In Canada in 2010, aggregate investments by firms and households (I_t) represented approximately the following share of GDP:
   (a) 37%
   (b) 49%
   (c) 7%
   (d) 18%✓
   (e) 28%

5. According to the theory of intertemporal choice that we saw in class, for a net saver, a <u>decrease</u> in the interest rate
   (a) will always lead her to increase today's consumption level and decrease that of tomorrow.
   (b) will always lead her to increase today's consumption level and increase that of tomorrow.
   (c) will lead her to increase present consumption if the wealth effect is stronger than the substitution effect.
   (d) will lead her to decrease present consumption if the wealth effect is stronger than the substitution effect.✓

6. According to the empirical evidence, a decrease in the interest rate
   (a) will lead consumers to save more.
   (b) will lead consumers to increase present consumption in the aggregate.✓
   (c) will lead consumers to decrease present consumption in the aggregate.
   (d) will have no noticeable effect on aggregate consumption.
   (e) there is no empirical evidence on how interest rates affect consumption levels.

7. Which of the following assertions is clearly FALSE.
   a) For Malthus, the best way to improve living standards in the long run is through increased land productivity.✓
   b) Before the 1700s, humans generally lived at the subsistence level without much differences through time and places.
   c) The Malthus model does a pretty good job at explaining long run per capita economic growth before the 1700s.
   d) In Ireland, the introduction of the potato crop from the Americas has not contributed to improving the standards of living in the long run, as predicted by the Malthus model.

8. Suppose that in a certain country, one-fifth of the females die in infancy; two-fifths die at age 30; and two-fifths live to age 60. Furthermore, women bear one child at age 22, one child at age 26, one child at age 29, and one child at age 32. Where one-half of all children born are girls, what is the net rate of reproduction for this country (NRR)?
   (a) 1.25
   (b) 1.4✓
   (c) 1.0
   (d) 2.0
   (e) 0.75

9. Suppose that two countries, A and B, have the same rates of investment and depreciation, the same levels of productivity, and the same levels of output per worker today. Population growth is however greater in country A than B. Which of the following is true according to the Solow model:
   (a) Country B has more capital per worker than country A.

(b) Country A has more capital per worker than country B.
(c) The present growth rate of output per worker is larger in country B than A.✓
(d) The present growth rate of output per worker is larger in country A than B.

10. Which of the following is mostly TRUE?
    (a) According to the Malthusian model of population and economic growth, a technological improvement leads to higher standards of living in the long run.
    (b) The Malthusian model of population and economic growth is useful to explain increases in standards of living in the industrialized world over the last 200 years.
    (c) A drop in the mortality rate can lead to lower fertility through the effect of increased incentives to invest in a child's education. ✓
    (d) A drop in the mortality rate can only lead to higher population growth in the long run.
    (e) Better access to contraceptives is the leading explanation for lower population growth in today's developed world.

11. We have seen that both the Malthus and the Solow models can be used to explain the effects of population growth of people's income levels. A fundamental difference concerning the *basic assumptions* of the two models is that
    (a) the capital depreciation rate is larger with Malthus than Solow.
    (b) the quantity of production factors is fixed with Malthus while it is endogenous with Solow.✓
    (c) population always grows faster with Malthus than Solow.
    (d) the savings rate is endogenous with Malthus while it is exogenous with Solow.
    (e) population growth is exogenous with Malthus while it is endogenous with Solow.

12. Which of the following assertions is mostly FALSE?

    Through the history of today's rich countries, population growth has never reached such high levels as observed today in many poorer countries partly because
    a) in many of today's poorer countries, the mortality rate has fallen *more rapidly* than in the history of today's rich countries.
    b) in many of today's rich countries, the fertility rate dropped *before* the drop in the mortality rate.✓
    c) in many poorer countries, the fertility rate does not drop *as much* to compensate for the lower mortality rate.
    d) in many of today's rich countries, the factors explaining the drop in the mortality rate occurred in sequence.
    e) in many of today's poorer countries, the factors explaining the drop in the mortality rate occurred simultaneously.

13. Suppose that a constant 10% of output is invested, capital stock depreciates at a constant rate of 5% and population grows at a rate of 5%. If the economy exhibits a Cobb-Douglas production function $y = Ak^\alpha$, with $\alpha = 1/3$, $A = 10$ and the current level of capital per worker is $k_0 = 12$, what will happen to per capita income at $t = 1$?
    a) It decreases by 2.9%.
    b) It decreases by 1.2%.
    c) It remains unchanged.
    d) It increases by 1.2%.
    e) It increases by 2.9%.✓

14. In the economy described by question 13, the per-capita income level in the long run will be equal to
    (a) 31.6✓
    (b) 35.8
    (c) 42.5
    (d) 55.8
    (e) 58.9

15. According to historical observations,
    (a) nutrition cannot be an important factor in explaining income differences between countries because even though there exists large differences in nutrition levels, nutrition does not have a significant impact on people's capacity to produce.
    (b) nutrition cannot be an important factor in explaining income differences between countries because nutrition levels are roughly the same across the world.
    (c) the role of nutrition in explaining economic growth in the UK since 1780 does not appear to be significant.
    (d) better nutrition plays an important role in explaining income levels because not only can workers work better, but it also allows the previously worst fed people to work when they were too weak to work before. ✓
    (e) the impact of better nutrition is mostly due to the fact that it allows the previously worst fed people to work when they were too weak to work before, but it does not have an important impact on those who already work.

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. (20 points) Human Capital

Suppose, to simplify, that the total adult population size in the USA in 2000 was $L = 1,000$. Let L_X denote the number of adults with X years of schooling. According to the distribution of education levels across the adult population in the USA in 2000, we have: $L_0 = 8$, $L_4 = 43$, $L_8 = 39$, $L_{10} = 229$, $L_{12} = 200$, $L_{14} = 236$, $L_{16} = 245$. The returns to education are 13.4% per year for the first four years, 10.1% per year for years 5 to 8, and 6.8% per year for any additional year of education after the eighth year.

1.a) (10 points) Calculate the fraction of wages that is being paid to human capital in the entire economy. (Give the details of your calculations with brief explanations.)

1.b)(10 points) If salaries make up 2/3 of total national income, how important is human capital to explain total income levels? How does this compare to physical capital? And raw labor? Interpret birefly.

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2. (20 points) A theory of intertemporal choice Suppose that Ronaldo lives for two periods only, $t \in \{1, 2\}$. Y_{dt} is his disposable income at period t and W_1 is his initial wealth at period 1. He can save or borrow at interest rate r and cannot leave a bequest or unpaid debt after period 2. C_t is his consumption level at period t and S_1 represents the savings level in period 1. Ronaldo's indifference curves between the two period's consumption levels are convex.

With the help of graphical analysis, illustrate a case in which a drop in his initial wealth leads Ronaldo to go from being a net saver to a net borrower. Denote the high and low initial wealths as W_1^H and W_1^L respectively. Make sure to identify clearly the points for which $S_1 = 0$. Explain briefly your reasoning, both graphical and mathematical.