

## **MIDTERM 1**

A total of 50 points possible.

Last Name: **KEY** First Name: \_\_\_\_\_

Your Student ID Number: \_ \_ \_ \_ - \_ \_ \_ - \_ \_ \_ \_

### **Part A: Multiple Choice Questions**

(15 questions, each of which is worth 2 points)

1. What are the dates traditionally assigned to the Industrial Revolution period in England?
  - A. 1790-1850
  - B. 1790-1860
  - C. 1760-1860**
  - D. 1760-1820
  - E. 1670-1770
  
2. What was the typical rate of productivity growth in the PRE-INDUSTRIAL economy?
  - A. between 0% and 0.1%**
  - B. between 0.1% and 0.4%
  - C. between 0.4% and 0.8%
  - D. between 0.8% and 1.2%
  - E. 0%
  
3. What was the typical rate of productivity growth in successful economies after 1800?
  - A. between 0% and 0.1%
  - B. between 0.1% and 0.4%
  - C. between 0.4% and 0.8%
  - D. between 0.8% and 1.2%**
  - E. 0%

4. In the Malthusian world, what formula allows us to estimate approximately the rate of productivity growth in societies before 1800 (N is population, A is the efficiency level of a society).

- A.  $g_A = c g_N$
- B.  $g_A = (1-\alpha)g_{Q/N} + \gamma g_N$
- C.  $g_A = (1-\alpha)g_{Q/L} - \gamma g_L$
- D.  $g_A = (1-\alpha)g_{Q/N} - \gamma g_N$
- E.  $g_A = g_N$

5. In what year were both the Spinning Jenny and the Water Frame invented?

- A. 1733
- B. 1769**
- C. 1834
- D. 1869
- E. 1688

6. Which of the following industries had the least dramatic productivity advance in the Industrial Revolution?

- A. Cotton textiles
- B. Coal Mining**
- C. Wool textiles
- D. Steam Engines
- E. Iron and Steel

7. One possible reason for the decline in the female age of first marriage and in the higher percentage of women ever marrying in the Industrial Revolution in England was

- A. Higher real earnings all across the economy.
- B. The sharp decline in mortality in childbearing.**
- C. The introduction of contraception within marriage.
- D. The great fall in the price of soap.
- E. Improved employment opportunities in industry.

8. The Industrial Revolution does not seem to explain the “Demographic Revolution” that occurred in England at the same time. This is because:

- A. Population grew because women married at younger ages.
- B. Population grew because more women got married.
- C. There was not much demand for labor since machines displaced people in the Industrial Revolution.
- D. The “demographic revolution” did not begin till 1800.
- E. The average age of marriage fell as much in agricultural parishes as in manufacturing parishes.**

9. Historians have inferred an **agricultural revolution** accompanied the Industrial Revolution because

- A. The population of England tripled and more people were employed in industry.**
- B. The enclosure movement started after 1750.
- C. There was widespread mechanization in agriculture.
- D. Jethro Tull made the first scientific advances in agriculture in the 1730s.
- E. Grain yields were observed to increase dramatically.

10. On the eve of the Industrial Revolution the population of England was about 7 million people. The population of France was, in millions

- A. 7
- B. 10
- C. 15
- D. 21**
- E. 4

11. The **Glorious Revolution** of 1688-9 in England is

- A. The replacement of Catholicism by Protestantism in England
- B. The replacement of an absolute king by a king who was essentially a figurehead for Parliament**
- C. The introduction of modern paper money in the English economy
- D. The reform of the patent system that led to the Industrial Revolution.
- E. The name given to the introduction of calculus in the high school curriculum in that year when Isaac Newton was made minister of education.

12. What is the odd name in the following list?

- A. Arthur Young
- B. Turnip Townsend
- C. Farmer George
- D. James Hargreaves**
- E. Jethro Tull

13. Agriculture in England in the Industrial Revolution is believed traditionally to have experienced output growth rates of 0.9% per year, and input growth rates of 0% for land, 0.1% for labor, and 0.9% for capital. If the shares of land, labor and capital were respectively 0.4, 0.4 and 0.2. What was the productivity growth rate?

- A. 0.5%
- B. 0.7%**
- C. 0.9%
- D. 1.1%
- E. 0.3%

14. Suppose agriculture in England in the Industrial Revolution had a growth rate of output prices of 0.4%, a growth rate of capital costs of 0.4%, a growth rate of wages of 0.7% and a growth rate of land rents of 1.1%. What is the implied rate of productivity growth if the shares of each input in costs were as above?

- A. -0.2%
- B. 0%
- C. +0.2%
- D. +0.4%**
- E. -0.4%

15. Suppose that agriculture in the Industrial Revolution experienced productivity growth rates of 2% a year. Suppose also the share of the English labor force in agriculture was 50%, the share of English output which was from agriculture was 40%, and the share of English capital agriculture was 60%. How much overall productivity growth was generated from agriculture?

- A. 0.8%**
- B. 1%
- C. 1.2%
- D. 2%
- E. 0.4%

## **Part B: LONG ANSWER**

1. What interesting lessons emerge when we look at the private returns to innovators in cotton textiles in the Industrial Revolution era in England? (20)

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**A full credit answer would explore the following details:**

- 1) In general, innovators made little profits from their innovations.**
- 2) Small returns to innovators were due to the inability of the patent system to protect them and the ease with which others could copy innovations without punishment.**
- 3) Examples of innovators, their inventions, and whether they were successful at earning money (Arkwright is an especially important example).**
- 4) Arkwright was able to make money because a- his Water Frame was large (so it was hard to use illegally) and b- most of his money came from reorganizing factories (consulting).**
- 5) Mention some other lesson (e.g., technology was biased toward large scale developments, production became a centralized process, land owners and consumers were the major beneficiaries of productivity growth, etc.).**

**At a minimum, most people cited at least #1 and #2 above. This would have resulted in a score around 12/20, assuming no erroneous information was also included in the essay.**