ECON 448 Technology and Industrial Dynamics

2002-2005 Mid-term and Final Exam Questions

1. Define the following concepts:
Patent
National system of innovation
Mission-oriented technology policy
Sixth Framework Programme
Solar firm model
Tacit knowledge
Mode of regulation
Taylorism
Organic composition of capital
Embodied technology
Federated enterprises
Key input
Innovation

2. Discuss the characteristics of main types of Japanese industrial organization (Zaibatsu, business group, and network). Describe the type of industrial organization that is dominant in Turkey by using Imai's conceptual framework

3. Write an essay on the so-called "Productivity Paradox". Please do not forget to discuss its definition, empirical evidence, and the arguments that are suggested to explain the paradox. What do you think if there is really any paradox? Why (not)?

4. Does Turkey need any technology/innovation policy? Why (not)? (Please be very specific in defining problems and suggesting, if any, policies.)

5. Summarize the main characteristics and limitations of various regimes of accumulation observed in developing countries. Which one has been dominant in Turkey since the early 1980s? Why (not)?

6. Does the development / diffusion of new flexible production technologies hold back the process of globalization? Why (not)?

7. What are the sources of increasing returns to adoption? What causes lock-in into an inferior technology? Give a specific/historical example (except the ones already discussed in class).

8. Calculate total factor productivity growth rates for the following country for years 1991-92 and 1992-93. Do you think the TFP growth rates reflect technological change? Why (not)?

Year	Value added USD (current prices)	Value added USD (1992 prices)	Wage bill USD	Number of hours worked	Capital stock USD (current prices)	Capital stock USD (1992 prices)
1991	100	100	50	200	80	80
1992	120	110	60	210	92	84
1993	130	110	65	210	99	84

9. Explain what constitutes a National System of Innovation (NSI). Discuss the functions of various components that make up a NSI.

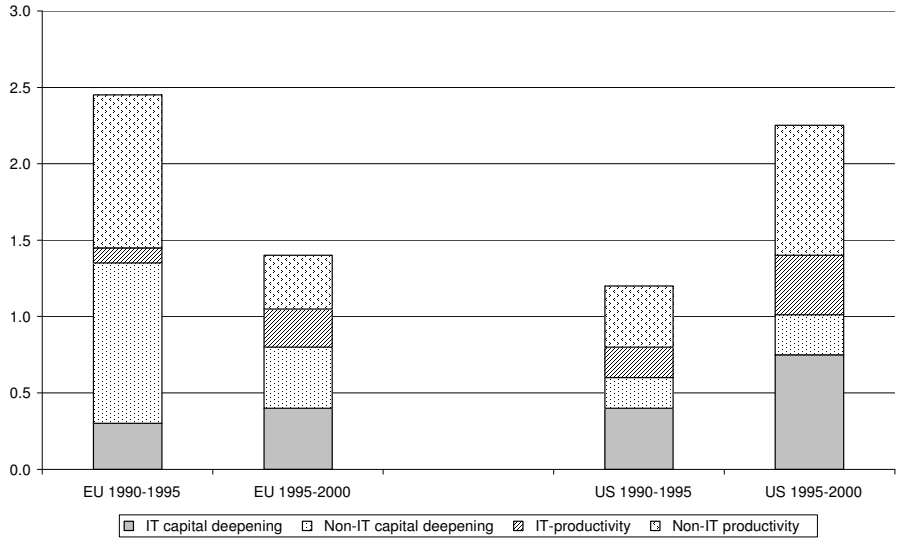
10. What is the link between (the degree of) vertical integration and the rate of technological change? Is there any causality running between these two variables? (Hint: Langlois, Teece, …)

11. What is the impact of the development of new flexible/lean production technologies on the process of globalization?

12. Compare and contrast basic characteristics of the old Fordist and the new, emerging Information & Communication techno-economic paradigms.

13. Discuss how Boyer explains the economic crises of the late 19th century, the early 20th century, and the 1970s.

14. The following table presents the data on the decomposition of labor productivity growth in the EU and the USA for two periods, 1990-1995 and 1995-2000. Discuss possible factors behind the divergent patterns observed in these economies.



15. Discuss how Piore and Sabel explain the world economic crisis in the 1970s. Please do not forget to discuss external shocks and the main reasons for the crisis. (*Hint:* Piore and Sabel developed the theory of flexible specialization in their book, *Second Industrial Divide*, published in 1984.)

16. Explain how total factor productivity (TFP) growth is defined and calculated. Discuss problems in calculating TFP growth. Please clearly explain your assumptions and derivations.

17. (a) Consider a competitive market. The market demand curve is given by

$P = 100 - Q$

where P is the product price and Q the quantity demanded. All firms have the same marginal cost, MC = 80 YTL. An independent innovator innovates a new production technology that reduces the marginal cost to 20 YTL. Find the maximum profit the innovator can make by *selling* its technology.

(b) Consider a monopolist market. The market demand curve is given by

$P = 100 - \frac{1}{2} Q$

where P is the product price and Q the quantity demanded. The marginal cost of the monopolist firm, MC, is equal to 80 YTL. An independent innovator innovates a new production technology that reduces the marginal cost to 20 YTL. Find the maximum profit the innovator can make by *selling* its technology to the monopolist firm.

(c) Which market provides stronger incentives to innovate? Why?