

Mastering Theories of Technology and Innovation 2009

Final Exam, 26 October 2009, 9.00 – 12.00 a.m.

*Please select 4 of the 5 following questions and answer them. Mark clearly your selection on this sheet and hand it in together with your answers. **Your final grade will be determined on the basis of the answers you provide for the questions selected.** Answering more than the selected questions will thus have no impact on your grade.*

Question 1

- a) Dosi discusses 5 stylized facts of contemporary innovation. Briefly describe these stylized facts.
- b) What is the productivity growth puzzle? Discuss the cornerstones of Nelson/Winter's *useful theory of innovation*. Focus on the design phase of innovation (and thus not the selection phase).
- c) Compare Dosi's notion of a technological paradigm with the concept of a technological regime as introduced in the articles of Geels, Rip/Schot and van der Poel.

Question 2

- a) What is path dependence? Through which mechanism do Arthur and David explain path dependence? Use an example to illustrate your answer.
- b) What is path creation? Explain the concepts of embedded agency, mindful deviation and momentum. Discuss how Garud/Karneo's theory mindfully deviates from the earlier notion of path dependence. Use an example to make your case.
- c) Given Freeman's article about national research systems: Do you think Freeman would rather agree with the notion of path dependence or path creation?

Question 3

- a) Explain the basic concepts of SCOT. Why did Pinch/Bijker set out to develop the theory of SCOT?
- b) What is a technological frame and how is it different from the idea of a technological paradigm? Use an example of your choice to explain how 'inclusion' in a frame can foster or hamper innovation.
- c) What are the basic functions of user-producer interactions according to Lundvall? Explain this notion and compare it with the concept of rhetorical closure.

Question 4

- a) Describe the evolution of a Large Technical System (LTS). Refer to the notion of the 'seamless web' and use an example to discuss five phases in the evolution of a LTS.
- b) Discuss the strengths and weaknesses of the LTS approach.
- c) Baldwin et al. propose a model for the diffusion and commercialization of user innovations. Discuss this model (you do not have to use the formal part of it!) and briefly compare it with Hughes' notion of the growth and evolution of a LTS.

Question 5

- a) Teece proposes a framework to explain how firms can profit from innovation. What are the basic tenets of this framework. Use an example of your choice to explain and illustrate.
- b) Use an example to describe what a technology cycle is. Illustrate the characteristics of the four phases and discuss the scope of the technology cycles theory as compared with the notion of technological transitions.
- c) The following figure is used by Teece to describe a basic strategic challenge that innovators faces. Explain the figure and discuss the challenge.

