

## RGIT

### MIRS program

NO CONSULTATION

**Duration:** 1 hour and 30 minutes

**First Exam**

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#### Structure of the exam:

Section A – concepts and contrasts	(you can <u>choose</u> questions)	[6 points]
Section B – multiple answers	(reply <u>all</u> )	[5 points]
Section C – comments	(you can <u>choose</u> questions)	[4 points]
Section D – empirics	(you can <u>choose</u> questions)	[5 points]

#### Attention, please take note:

The student can choose many of the questions she prefers to address.

But no points will be given to *repeat* answers. If two questions are covering similar topics the student is expected **NOT** to choose one of them (for instance if a question in Section A refers to concept X and a statement in Section B also implies concept X then the student should not choose one of the two questions).

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**A. Definitions and distinctions (choose only two questions and tackle them)**

A1. Provide arguments in defence of the linear model.

A2. The chain-linked model is different from the linear model: what? how? why?

A3. Provide three instances that distinguish the multi-channel model from its predecessors.

A4. Articulate diffusion of innovation as a more interesting concept than it may appear.

A5. XXXX xxxxxxxx vs XXXX xxxxxxxx.

A6. XXXX xxxxxxxx, xxxx and xxxx: relate them.

A7. Technological xxxxxxxx, xxxxxxxx, and xxxxxxxx.

A8. The life cycle of an xxxxxxxx: describe, unpack, illustrate.

A9. The xxxxxxxx taxonomy: provide a description, give details, place it in historical time.

**B. Identify the correct answers (reply to all questions; errors = 0.25 points of penalty)**

**B.1 True or false?**

- a) We can understand knowledge as a *stock* variable and learning as a *flow* variable.
- b) An example of Disembodied knowledge is technology in a form a physical product. An example of Embodied knowledge is the R&D work that happens in a lab.
- c) Concepts like “path dependence” (by Paul David) and “lock-in” (Brian Arthur) point to situations in which the technologies that win are always the optimal ones.

**B.2 Fill the blanks**

- a) According to the OECD (Oslo Manual, 2005) there for types of innovation: \_\_\_\_\_, \_\_\_\_\_, organisational, and marketing innovation.
- a) Following the \_\_\_\_\_ model, the innovation process takes place in an context shaped by the macro-environment and micro-environment.
- b) Schumpeter mark \_\_\_\_ is typical of biotech, whereas innovation the pharmaceutical industry develops according to Schumpeter mark \_\_\_\_.

**B.3. Select one statement:**

- a) One statement here is incorrect:
- Adam Smith saw learning-by-doing as a by-product of specialisation with the firm
  - In Charles Darwin mutations are the equivalent of innovation in economics
  - For Karl Marx did not have an explanation for why capitalism is such a dynamic economic system
  - Schumpeter included insights of these three previous authors in his theory.
- b) One of these things we cannot say in the economics of innovation:
- The key economic character in Schumpeter was the inventor, not the entrepreneur
  - “First movers” may be pioneers but “fast seconds” may be more profitable
  - Incremental innovation represents continuous improvement.
  - In architectural innovation a change in a component calls from adjustments in other components

**C. Questions that refer to key readings seen in class (answer to just one question)**

C1. In his leading chapter “Innovation: A guide to the literature”, which is the introduction to the influential *Oxford Handbook of Innovation*, Jan Fagerberg refers to xxxx xxxxx xxx. What factors are presented to account for this?

C1. In this same paper, Fagerberg cites a passage of Kline and Rosenberg (1986), where they point out: “xxxx xxxxxxxx xx xxxxx xxxx xxx xxxx xxx xxxx xxxxxxxx xx xxxxx xxxx xxx xxxx xxx xxxx”. xxxxxxxx xx xxxxx xxxx xxx xxxx xxx xxxx xxxxxxxx xx xxxxx xxxx xxx xxxx xxx xxxx xxxxxxxx xx xxxxx xxxx xxx xxxx xxx xxxx xxxxxxxx xx xxxxx xxxx xxx xxxx xxx xxxx xxx.

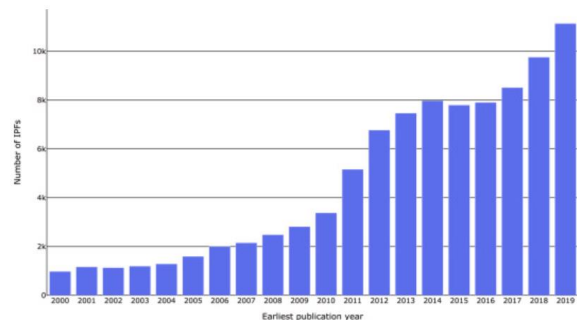
C2. According to Paul Geroski (see his book chapters in the reading list) technological trajectories are apparent in performance improvements along given variables, for instance (cargo) capacity or speed. Discuss the concept and explore it with the help of examples.

**D. Questions that refer to key cases seen in class and/or supported in materials (deal with just one question)**

D1. Recent news from the deployment of electrical vehicles in Oslo, Norway, are instructive in several ways in what innovation diffusion is concerned. Please discuss ... xxxx xxxxxxxx xx xxxxx xxxx xxx xxxx xxx.



D2. This figure from Metzger et al. (2023) shows the patterns of global patenting activity on different battery types. How to account the trend and the fluctuations around the trend?



D3. The field of semiconductors is going through a major moment of reconfiguration. What is going on reveals the systemic nature of innovation. Explore the dimensions of change: product complexity, product life cycle, security issues, and geopolitical competition.

***Good work!***