HELSINKI UNIVERSITY OF TECHNOLOGY
INSTITUTE OF STRATEGY AND INTERNATIONAL BUSINESS

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Name: _____

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Year you followed the course   _____

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Please write your name, student number, course code and name, this date and your signature on each additional paper you use for answering the case questions. Use clear handwriting. You can answer the questions either in English, Finnish or Swedish. You have to get at least 25 points (out of 50) to pass the examination.

A. TRUE-FALSE QUESTIONS   (max 15 points)

Note: There is only 1 correct answer to each true-false question. The questions are evaluated as follows:
- wrong answer: -1 point
- no answer: 0 points
- correct answer: +1 point

1. Invention can be characterized as an innovation that has been put into commercial use.
   ○ TRUE
   ○ **FALSE – it's the opposite**

2. Architectural innovation typically has a "competence-destroying" effect on incumbents' competence bases.
   We have decided to accept both replies (as well as the 'no reply' option), because this question was too ambiguous. Architectural knowledge gets embedded in organizational knowledge structures and is not easily codifiable. When architecture changes, this knowledge may become obsolete, and a competence-destroying effect will follow. But this is quite a subtle issue, and we decided to accept all answers.

3. The 'rugby' model of innovation (or the 4th generation model) is characterized by frequent application of concurrent engineering methods.
   ○ **TRUE**
   ○ FALSE

4. Dominant designs typically emerge <u>before</u> the rate of process innovation reaches a maximum.
   ○ **TRUE**
   ○ FALSE

5. In Moore's model, the 'chasm' refers to a situation in which innovators mis-interpret market signals.
   ○ **TRUE**
   ○ FALSE

6. In Christensen's 'disruptive technologies' model, the expected performance requirement trajectory of the mainstream market rises <u>more rapidly</u> than the expected performance trajectory of a disruptive technology.
   ○ TRUE
   ○ **FALSE – the opposite is true**

7. In the 'technology cycle' model, the 'era of ferment' is characterized by intense competition between alternative product designs.
   ○ **TRUE**
   ○ FALSE

8. A strong legal-technical appropriability regime favors imitators over innovators.
   ○ TRUE
   ○ **FALSE – the opposite is true**

9. Netscape Navigator's loss of market leadership to MS Internet Explorer provides a good example of a situation in which strong dominance in one domain (PC operating systems) is leveraged to gain dominance in a closely related domain (internet browsers).
   ○ **TRUE**
   ○ FALSE

10. A "network externality" is said to be in operation when a product's value to a consumer changes as the number of users of the product changes.
    ○ **TRUE**
    ○ FALSE

11. "Increasing returns" are said to be in operation when additional units of outputs require progressively greater additions in inputs.
    ○ TRUE
    ○ **FALSE – it is the opposite**

12. Induced strategic action is more closely associated with the firm's corporate strategy than autonomous strategic action.
    ○ **TRUE**
    ○ FALSE

13. A 'lead user' defined as one who buys more than the average customer.
    ○ TRUE
    ○ **FALSE – they are early adopters who have tried to solve the problem by themselves and are ahead of pragmatists and reflect the general market values/necessities**

14. In 'discovery-driven planning' it is important to begin by making assumptions and then stick to these, since otherwise it would be difficult to manage uncertainty.
    ○ TRUE
    ○ **FALSE – you do not begin with assumptions, you try to postpone making them and when you make them you try to refine and clarify them using checkpoints/milestones**

15. A key difference between patents and copyrights is that copyrights do <u>not</u> protect the original idea.
    ○ **TRUE**
    ○ FALSE

B. MULTIPLE CHOICE QUESTIONS (max 10 points)

Choose only one alternative per question. There is only 1 correct answer to each question. The responses are evaluated as follows:
- wrong answer(s): 0
- no answer: 0
- correct answer: +1

1. The process of creating a reverse income statement starts by estimating
   a. projected inventory
   b. projected production capacity
   c. required profit
   d. required sales costs
   ANSWER: ___c

2. Dealing with architectural innovation is often difficult for incumbents because:
   a. they easily get alienated from customer needs
   b. they do not take competitors seriously
   c. new entrants have privileged access to new components
   d. established organizational information filters cause them to focus on wrong technical issues
   ANSWER: ___d

3. All three of the following criteria are necessary, but not yet sufficient conditions for a core competence to become a source of competitive advantage:
   a. they are distinctive, valuable, and codified
   b. they are tacit, radical, and imperfectly imitable
   c. they are incremental, non-substitutable, and rare
   d. they are rare, valuable, and imperfectly imitable
   ANSWER: ___d

4. An appropriabilty regimes is NOT determined by:
   a. innovator's ability to profit from innovation
   b. firms capabilities
   c. patents
   d. imitability of knowledge
   ANSWER: ___ b

5. The chasm doesn't refer to:
   a. The difference between user values in early and mainstream markets
   b. Success to commercialize in early markets
   c. The stage when it is important to identify a single group of pragmatist customers in the emerging mainstream market
   d. Problems in adapting to mass markets
   ANSWER: ___ b

6. The replacement of an analogue dialing device with a digital in a desk telephone is a/an :
   a. incremental innovation
   b. architectural innovation
   c. modular innovation
   d. radical innovation
   ANSWER: ___ c

7. Dominant design phases are characterized by:
   a. shifting focus from process innovations to product innovations
   b. incremental innovations
   c. generally excepted product architecture
   d. embedded practices and procedures in firms
   ANSWER: ___ b, c, and d where accepted

8. The sources of strategic dissonance does not refer to:
   a. relying on existing corporate strategy
   b. divergence between changing basis of competition in the industry and the firm distinctive competences
   c. diversification of corporate strategy
   d. when acknowledged senior experts gets a key role in the firm strategy making process
   e. divergence between corporate strategy and strategic action
   ANSWER: ___c

9. Absorptive capacity is NOT advanced by:
   a. Own R&D
   b. Direct involvement in manufacturing
   c. Previous learning capacity in old technology
   d. External venturing
    ANSWER: ___d

10. Corporate venture capital investments are done by firms to
    a. increase the sales and profit of the corporation's own business
    b. extend existing core product families
    c. cash in on existing superior knowledge of markets and technologies
    d. exploit synergies between the firm and the new venture
    ANSWER: ___ b and d where accepted

C. OPEN-END QUESTIONS (max 25 points)

Mini case: Amazon Kindle

Read the 8 page article and fact compilation about Amazon and Kindle and present your analysis within the scope of the questions. Use additional paper if necessary for answering.

1. Compare traditional paper based books with e-books value chains. How is value creation and value appropriation changing/ emerging in e-books relative to traditional industry? (5p)

Points to cover

1) Value migration in publishing and printing: e-books have **eliminated the costs of paper and printing (rather minor though), stocks and warehousing (extensive), packaging and shipping (large)**. E-books value chain marginal costs (of reproduction) also tend to zero for the distributors or creators of the e-books. The publishing of book might change dramatically. Much depends on how well actors learn and have capabilities to shift business model and strategize within the emerging e-book/e-content business era.

2) The emerging e-book value chain: **New types of complementary assets will become important** like internet access providers, electronic equipment manufacturers (Mobile phone manufacturers (tablets, PDAs, mini laptops, etc) as well as portals to sell them. Those that have a possibility to gain control within the e-book interface include e-book vendors, software developers (document format), e-book reader device manufacturers, and network operators.

3) The industry structure as well as firm strategic focus shifting **from a vertically integrated industry "publishing industry" into horizontally integrated "content industry"**. Thus music, video, TV and other content might emerge as interesting bundles. Economies of scale and scope lies differently within the emergent new structure.

4) **The e-book value proposition and value delivery shifts.** New critical issues for sustaining value of products as piracy/hacking/cracking of e-books can cause serious loss for publishers. Protection and copyright issues become critical. New logics of selling, e.g. book rentals. Additional value appropriation can be sought by offering different kind of electronic services and offerings bundled with e-books, as with Kindle and the availability of Wikipedia and dictionary

5) **The customer value stack.** The **initial costs** to purchase an e-book device like Kindle is enormous to traditional paper based books. Additional value appropriation can be sought by offering different kind of **electronic services and offerings bundled with e-books**. Reading on computer screens is very problematic: not comfortable as reading a paper book, and users cannot read e-books everywhere like a paper book without a reading device. Functionality / **accessibility** of the device around the world critical. Why should you carry your whole library with all the time?

2. What are the key externalities that Amazon needs to catalyze (5 points)

Points to cover

The five factors contributing and enabling technology related externalities are: learning by using, network externalities, economies of scale, informational increasing returns, and technological interrelatedness. The key externalities arising from these are listed below:

1) **Install base of Kindle and user base of e-books reader devices**. These are **direct network externalities** when the benefit from using a good increases with the number of other users of the same good. The direct network externalities can be either read as the install base of Kindle which is offcourse a critcal factor for Amazon but for the e-book business it is rather the install base of readers and accessories for e-books which is most critical for this business to provide needed dynamic externalities. Popularizing the downloading of books, newspapers and traditional print, thus should become key. Also increasing value of larger installed base through sharing of content e.g. through the feature of Kindle that enables you to send a highlight to a friend is crucial. This is important for gaining critical mass. A critical point to generating externalities through installed base/user base is hampered by the built-in EvDO radio connection and that it only works on the CDMA mobile telephony standard, which does not allow to currently extend the Kindle user base and the service platform Whispernet to work all around the world due to non compatibility.

2) **Complementary assets availability, production and attachment** (indirect network externalities). The complementary assets (listed in question 1) are important for enabling externalities in the domain of e-book business and Kindle. These could be additional software and additional services to the Kindle and e-book business, contracts with network operators to provide Amazon e-book Whispernet service platform for Kindle (availability and reliability) and e-payment service providers. Also partnering with magazines, publishing houses, content producers and blog communities seems critical to think of. Collaborations with PDA/Mobile phone manufacturers is critical if one thinks of e-book business and the service platform Amazon currently has built up. Also collaboration and partnering with Microsoft might prove valuable but might also be very dangerous in terms of losing control but should be evaluated in relation to strategizing around externalities.

3) **Technological interrelatedness, compatibility and interoperability** (indirect network externalities). Compatibility is the ability of two components to work within one system. Compatibility promotes customer lock-in effect, as future components will also need to be compatible. Interoperability refers to the ability of two or more given systems (e.g., devices, databases, networks or technologies) to act in concert with one another in accordance with a prescribed method to achieve a predictable result. Thus discussions related to **e-book reading formats** and ability to further send and copy files (trading within the user base of Kindle), e-mail support, mp3 support, Wikipedia access, usb-connections etc. are valuable. **Standardization of file sharing formats and readers** and the opportunity to enable the emergence of **dominant design** in relation to these and digital rights management (DRM) scheme are critical to enable increasing switching costs of users and producers of complementary goods. A discussion of the now chosen rather **closed software architecture** of Kindle is valuable.

4) **Learning by using is also a critical externality to enable.** This can be thought of in relation to pushing and providing paths for habits and value of users to migrate by enabling learning and exploration of technology by users and producers. Finding lead users and niche markets of Kindle for learning could be a valuable inroad into the e-book business area for Amazon.

3. Apply the Teece model on Amazon's e-book business. From this perspective, who are its major threats? (5 points)

Points to cover

Issues key to discuss in relation to the Teece model: appropriability, complementary assets and dominant design. The Amazon e-book business should include a discussion of both e-book selling, Kindle and the Whisperent service platform linking these two.

1) **Appropriability.** Appropriability depends on a) The nature of technology (tacitness, complexity, systemicity, and product-process nature) and b) efficacy of legal mechanisms of protection. Kindle is positioned within a weak legal/technical appropriability regime of e-book reader devices, as the device is easily re-engineered (and other devices with same features like PDAs/Tablets also exists) and the device and parts may be produced by several manufacturers (OEM producer currently and several other producers able and ready). The software for Kindle is proprietary (closed architecture) and do not allow further applications to easily be built on it currently (they are not using and open source software business model for this). Software is not easily protected and a weak apporpriability regime is also on this part present meaning that other software applications for e-reader devices may be rather easily developed based on Kindles software. In relation to Amazons position and brand reputation in internet book selling business and contracts with publishers gives it a position to enforce a tighter appropriability regime around the e-book business, one dominated by Amazons interface. Its current position also enables it also to choose new partnerships easily.

2) **Complementary assets.** Complementary assets should be analyzed by a) describing the business model with e-books b) own asset audit - Are they generic, specilized or co-specilized?) – where lies Amazons assets c) asset availiability analysis **- Are they generic (free), specilized (constrained) or co-specilized (constrained)?** d) analyzing likelihood of downstream, horizontal, upstream competitive diversification and integration of e-book business and e) how does the criticality of complementary assets in e-book business change over time? Amazon does not hold internal competence in hardware but related to software probably some but not those crucial for Kindle and its interface to the CDMA and Internet. The hardware can be said to be generic and free assets. Also software is generic and free. Publishing is probably more a co-specialized as Amazon needs to negotiate with publishing houses about e-book delivery and terms of distribution. Also network access/operators of 3G networks can be assumed to be partly generic and partly co-specialized depending on the geographic economic area. Probably more competencies lie in Amazon on the part which relates to the platform for organizing the e-books and other content delivery, payment and user customization. Thus these types of assets could be conferred as specialized in relation to Kindle.

3) **Dominant design.** Is e-book business is in a dominant design phase or not? The obvious answer is no and thus critical is to see that competing designs for the e-book business is just emerging and that there will be competition between designs. One should then think of what drives dominant design emergence in the e-book business. This requires thinking of several aspects as: User base? Standards (de facto or official)? Complementary assets? Complementary products? Network effects? Customer preferences?

4) **Major threats.** The appropriability regime, complementary assets and dominant design discussion and analysis should give directions for augmenting major threats. Several can be envisioned. Handheld and small portable digital devices (PDAs, tablets, smart phones, tablet PCs) are especially threatening in relation to the ecosystem they are attached to. It is rather a competition between designs than between single products and services. This said other product and service compilations may have some advantages e.g. multipurpose products that may be able to gain a broader user base, more rapid learning between users and producers, or technically better in performance on distinct dimensions (speed of download, accessibility, better displays, better battery performance, etc). Another threat is also the dependency on the EvDO network. Weather Sony is a threat or a possible collaborator is still unclear but should be brought into discussion. Together they could be much more able to push a dominant design in e-book business than competing on the standard in the same ecosystem.

4. What is the broader value and activity system to which Amazon needs to attach itself? How can it emerge as the one who controls the key resources? How can it control system evolution? (5 points)

Points to cover

Here one should evaluate how to control critical assets, provide system coordination, and share value for system evolution and control. This implies controlling systemically central, hard-to-copy, value-adding resources that lend themselves for complementarities. Another critical issue is to provide coordination and guidance for the rest of the system. Coordination of efforts includes synchronization of development activities and definition of systemic interfaces. It means that Amazon should provide for and encourage stable, profitable niches that allow for sustained specialization. This would imply opening up the closed software architecture of Kindle. The final aspect of enabling system evolution includes leaving money and profits on the table and not over-exploiting your partners.

1) **Control critical resources in the broader value and activity system**. Key assets to control: a) control over an installed base (e-books (titles); e-book readers (software), e-book reader devices), b) intellectual property rights c) ability to innovate, d) first-mover advantages, e) manufacturing, f) strength in complements and g) reputation and brand name. This could mean building on existing assets, brand reputation and marketing channels for e-commerce with especially books to extend installed base of e-book readers and Kindle, e.g. "e.g. if you buy two books, you can download one for free through Kindle". Develop the number of titles available for e-books and Kindle to become more attractive. Exclusive deals and cooperation with publishers and network operators to gain control over complementary assets. One might here also consider discussing compatibility issues with MS architecture.

2) **Coordination and guidance to enable emergence of dominant design in e-book business (Amazon e-book purchase interface and Kindle).** Synchronization of development activities, thus support for research and development work across the e-book business area. Support through **external venturing activity by Amazon and R&D alliances and -programs.** Definition of system interfaces is important and where Amazon holds excellent competencies. This would imply support and proactive work on **standards or defacto standards** development activities and projects for **software and interface applications** (between reader device and e-book purchasing platforms and publishers). Also extend the content production and innovative use of e-book reader for other applications and services. Open architecture for complementary asset developers, e.g. writers, software developers, and device and parts (screen, IC, radio, etc.) manufacturers, to enable attachment to the ecosystem could be very valuable,

3) **Preemption**. Build installed base early of Kindle especially through reducing purchase price (even considering a razor blade strategy) or building a even more compelling bundling of service and device. But Amazon should watch out for rapid technological progress (especially arising within the other ecosystems).

4) **Expectations management** / **strategic intent**. Manage expectations about e-book availability (type Moore's law but on the availability of e-books (exponential growth)) and e-book reader next generation device performance and reach (connectivity).

5) **Share value.** This would mean thinking carefully on the business model of e-book purches and probably keeping publishers happy given them interest and incentives for further expanding e-book titles. Also how to maintain and increase the developer community of a possible more open archictecture type platform of Kindle and Amazons e-book business should be carefully evaluated.

5. Which organizational arrangements and corporate level strategy would you choose for Amazons Kindle business? Present tangible organizational suggestions and strategy recommendations and justify them. (5p)

Possible points to cover
Evaluation: An informed and analytic discussion based on the four previous analyses is valued. Only focusing on part of the points presented here is also possible. Specific focus is put here on the argumentation and how well the arguments are based on previous points and grounded in technology strategy thinking.

1) **Venturing.** Organizational options that should be discussed in one or other way. One may then discuss **internal venturing** and/or **external venturing. For external venturing i**mportant is to highlight **the value captor's process** points and arguments. One needs to be **open for redirecting the new venture** (Kindle) allowing for multiple commercialization paths, e.g. kill, spinn-off, spin-in, recycle, salvage, or launch. This includes then **venture evluation processes** and possibly using **discovery driven planing** for this new business and tying milestones. Also refining assumptions about e-book bsuiness and Kindle is important. Internal ventruing discussion should include thinking about if to organize as a more autonomous or induced strategic behavior. One would conclude probably that **autonomous strategic behavior** is one that Amazon shoud foster for the e-book and Kindle bsuiness. Probably a separate business unit for the e-book business and Kindle would be what to persue. Important is here to think of Kindle and e-book business as an active experimentation and learning activity around an emergent design. The business is in an era of ferment. **Increasing and developing absorptive capacity** for the emergent e-book business. One should probably also think carefully here whcih are **Amazons core competencies** and how it could build on these in the e-book market space. Probably one would conclude then that Kindle is not perhaps Amazons future business but instead the platform (Whispernet) through which e-books and other contents and services are organized and and linked to the reader divices.

2) **Explore and learn in niche markets.** Lead users. One could also read the case as a disruptive technologies situation where new value propositions are emerging that currently does not meat quality demand of readership but enables new possibilities that are valued again (Clayton Christensen thinking). Then one should think carefully of which are those groups and niche markets, market at the side that could be interested in the e-book, e.g. academics that are inclined to hold large stocks of books and inability to easily access them, medical doctors that would need a lot of books and information available in their daily job, libraries. Find, explore and build up competencies in niche markets/segments. Think carefully who are lead users of e-books. Probably Amazon is to boldly launching this device to the mass market and should instead start small as Texas Instruments with RFID technology and cow tracking/monitoring in Europe.

3) **Contracting and alliances.** Options for collaboration are several. One could e.g. negotiate with publishers, so that they would produce e-books for every book they publish, or negotiate and cooperate with news agencies and provide news updates for a low price or free with some conditions. Also collaboration with mobile phone manufacturers could be valuable and a strategic option to ally with e.g. Nokia and have e-books available for the Nokia Tablet. Amazon has a favorable position in internet book and other goods selling.

4) **Supporting rapid user base development for Kindle.** Razorblade strategy could be thought of here, then selling the device (Kindle) nearly free/on loss and then capture value from e-book selling or other services, e.g. once the users have bought the device, they will sign a contract and are forced to buy 1 book each month (or get directly for a one year subscription 12 books which they can choose to download whenever they like).

E) **Enable externalities and bandwagon effect.** See question 2 for more on this.

END

ADDITIONAL COMMENTS: