
print name

INSTRUCTIONS:

1. The *Natural Capitalism* Exam must be completed within the allocated time (*i.e.*, 6:30 - 7:30).
It is a closed book exam.
2. **Recall the material difference between e.g. (for example) and i.e. (that is).**
3. As each student finishes the *Natural Capitalism* Exam, that student will receive an exam answer sheet and leave the exam room until after the end of the exam (*i.e.*, 7:30, unless all students finish earlier).
4. Grades will be posted to BlackBoard no later than 5:00 PM Thursday, September 30.
An email notice of the posting will be sent.
5. The *Natural Capitalism* Exam is worth 20% of the course grade.
This exam has 35 questions graded as if there are 33.
Harmless errors are far more likely than non-harmless errors in this test design.
Based on a statistical analysis of all students' answers, the instructor unilaterally may alter the grading of specific exam questions for all similarly situated students.
Any student may appeal the grading of this exam questions. However, only if a student successfully appeals the ambiguity of AT LEAST THREE questions on this exam will *that* student's exam grade change by the number of successful appeals in excess of two questions.
Appeals only affect the exam grades of those students that appeal.
6. **All appeals** of these exam questions must be:
[6A] typed; [6B] signed by the student in three ways, typed name, handwritten signature, and typed social security number; [6C] in sequence, list, immediately following the signature, each of the questions, by number, being appealed; [6D] after the [6C] list, argue each question, one at a time; [6E] at the beginning of each question's appeal, identify two or more reasonable meanings that the question could have had; [6F] argue why one or more of the identified reasonable meanings is *as* appropriate or is *more* appropriate than the meaning used for the answer key answer; and [6G] personally handed to the instructor **no later than 6:00 PM, respectively** on Tuesday or Wednesday, **October 5 or October 6.**

QUESTIONS:

1. T F Routinely, markets accurately value to damage to an ecosystem.
2. T F Switching from the current focus of marketing a sale of goods to marketing of a cradle-to-cradle sale of services **and** flows from those goods would align exactly a manufacturer's interests with the environment's interests.
3. T F Factor Ten efficiency is achieved when the same output is obtained from ten times the inputs.
4. T F The by-products of internal combustion automobiles contribute to the Greenhouse Effect, **but** the by-products of a hypercar (*e.g., water*) do **not**.
5. T F Oil is more likely to be **unavailable** at high prices before oil is **uncompetitive** at low prices.
6. T F Today, managers of industrial production systems tend to seek to optimize many, **but not** all, related feedback loops internal to that industrial production system; **but** typically ignore multiple feedback loops with the environment.
7. T F Today, industrial production systems tend to generate substantial waste both internal to the production systems **and** external to the production systems.
8. T F If both a process **and** the measurement **and** control of that process is more local, then superior optimization of both that process **and** similarly locally measured **and** controlled related process in aggregate is more likely; **but** optimization of the part **and** the whole is **neither** a necessary **nor** a sufficient outcome.

9. T F Today,
industrial production designs often are linear,
while
nature's designs are cyclic.
Accordingly,
industrial production often has falsely closed loops
while
nature's loops always are truly closed.
10. T F Biomimicry
can inform both the design of specific manufacturing processes
as well as
inform the structure **and** function of an entire economy.
11. T F A building's design
can both positively **and** negatively effect
human behavior in organizations.
12. T F The whole is the summation of its parts.
13. T F Efficiency can **not** be capitalized.
14. T F Design is applied foresight.
15. T F Optimizing components
in isolation of the whole system is the ideal means of optimizing
the whole system.
16. T F Downstream savings
offer the greatest leverage
when seeking efficiency for a whole system.
17. T F *Muda*
is any human activity that absorbs resources **and** creates value.
18. T F Lean thinking urges competition against
the relative standard of a market competitor (*e.g., six sigma*)
rather than
competition against absolute perfection.

19. T F As compared with direct management by government, price signals that arrive in a synchronized fashion relative to a system's needs can better organize complex system interactions **as well as** incite innovation.
20. T F Rarely, if ever, is manufactured capital a true substitute for natural capital: thus, natural capital becomes a limiting variable. Also, human experience prior to the Industrial Revolution has generated a collection of institutional biases towards perceiving natural capital as a slack variable.
21. T F Perverse subsidies encourage behavior detrimental to the process being subsidized. All subsidies are perverse.
22. T F Today, both natural fibers **and** manufactured fibers are produced in a sustainable manner.
23. T F Closing material loops can **unlock** opportunities both for reduction **and** recycling of inputs.
24. T F From a technological perspective, industrial agriculture has been very successful.
25. T F Farms, as natural systems, offer many opportunities to use the four forms of capital
(*i.e., human, financial, manufactured, **and** natural*)
of Natural Capitalism
as well as to use
the four central strategies
(*i.e., radical resource productivity, biomimicry, service **and** flow economy, **and** investing in natural capital*)
of Natural Capitalism.

26. T F Water is a **not** limiting variable for life on Earth.
27. T F The current manufactured systems for delivery **and** recovery of water have maximized the value generation from *muda*.
28. T F Human behavior **neither** has altered **nor** can alter the Earth's climate.
29. T F The presence **or** the absence of a stimuli (*e.g., price signal*) is less important than the stimulated system's ability to respond to the stimuli (*e.g., genetics*) **and** thus to generate a change desired in that system.
30. T F The current array of market price signals **and** market decisions reflect explicit assumptions that the future has a high value **and** that the environment is a necessary input.
31. T F If profitable for the adopting firm, then efficiency enhancing innovations gain rapid market acceptance.
32. T F Often, the cause of a current problem is a prior, narrowly tailored, technological solution to a different problem, **and** that prior solution revealed previously **unknown or misunderstood** feed back loops.
33. T F Both natural systems **and** social systems provide both monetized resources **and** services **as well as nonmonetized resources and** services.
34. T F An observer of a complex system will see that system through the lens of the observer's paradigm; thus, an interdisciplinary approach tends to improve the accuracy of perception.
35. T F Businesses will earn greater long-term profits by rejecting the current focus on narrowly defined subsystem revenue streams **and** adopting a whole system focus.