Quiz for IDS.332J and IDS.333   October 21, 2021

Nature of Quiz:

This is an "open-book" quiz. As it would be in professional practice, you can seek out and obtain answers from your notes, texts, the web, friends, etc.

The questions concern the range of concepts, ideas, and associated conclusions we have been exploring in class. You are not required to do any calculations, but you may show some to illustrate your responses.

Your answers must be in your own words, your own terms. Put another way, you should demonstrate your ability to express the answers yourself, to show that you have "internalized" the concepts.

Some, perhaps many of you, will have prepared basic answers in advance. That is OK. Getting you to develop your understanding of the concepts is the object of the course.

As stressed in the Quiz Review, responses phrased in exactly the same way as some other student, or taken directly from a text, will not be given credit. The quiz is to . Type or paste in your answers. Images, diagrams. or screenshots are OK.

This template provides space after each question for your answer. This space is not a limit however. You can use as much as you want.

Note that longer answers are not inherently better! About 10 sentences should do nicely in most cases.

You can answer questions in any order. You might scan them before you start.

I've enjoyed and appreciated the opportunity to become acquainted with you! Richard

There are 11 Questions – each counting 10 points (yes, 110% score is possible!)

Question 1: What is Flexibility in Design?
Explain the course to a professional – such as a job interviewer, a faculty advisor, a fellow student, or a co-worker.
- Describe a Flexible Design.
- Under what conditions might a Flexible Design desirable?
- What are the potential Benefits of Flexible Design?
- How does Flexibility in Design differ from standard, conventional practice?

Question 2: Cost of Flexibility in Design
Your colleague says: "Nice to have flexibility but it costs more and we can't afford it".
Respond to this remark by discussing the flexibility costs in terms of
- Initial capital investments (Capex) in the system
- Long-term economic costs
- Value as insurance against downside risks
- Value in terms of capacity to adapt rapidly to new opportunities or needs

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Question 3: Forecast is 'always' wrong
How do you interpret the claim that "The forecast is 'always' wrong"? Obviously, some forecasts are correct at some time, even many times.
- What is the meaning of this statement?
- What are the limitations to this claim?
- Why might it be a good starting point for an Analysis of Flexibility in Design?

Question 4: Flaw of Averages
- Define the "Flaw of Averages"? Give an example.
- Are there any systems to which it does not apply? if so, characterize them.
- What implication does the Flaw of Averages have on the desirability of any standard deterministic analysis of the design and management of systems?

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Question 5: Distribution of Results from Uncertainty Analysis of Project
Uncertainty about the future leads to a range of estimates for the value of any project.
- Define the meaning of the "distribution" of results of the uncertainty analysis,
- Explain how this distribution relates to a target curve.
- What does the distribution of possible results tell us about possible risks?

Question 6: Comparing Deterministic and Uncertain Analyses of Projects.
The Value of a project plan obtained from a deterministic analysis often differs from the value obtained from an analysis that recognizes future uncertainties.
- Explain why and how this can occur.
- Are valuations under uncertainty ever systematically more or less than deterministic estimates?
- If so, what's the explanation?

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Question 7: Discount rate
One view is that the Discount Rate should represent the Opportunity Cost of Capital.
- Explain the concept of "opportunity cost of capital."
- Discuss why Discount Rate should (or should not) equal this Opportunity Cost.
- State your field of work – and indicate the level of Discount Rate that applies.

Question 8: Economies of Scale
- Explain the meaning of Economies of Scale – and give an example.
- What do Economies of Scale have to do with Flexibility in Design?
- What is the effect of greater Economies of Scale on the desirability of Flexibility?

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Question 9: Effect of Discount Rates and Learning on Flexibility in Design

- What's the effect of higher Discount Rates on the desirability of Flexibility?
- Provide an intuitive explanation of your reasoning to your answer to above.
- How does the concept of "Learning" fit into the desirability of Flexibility?

Question 10: Value of Information

- How can we estimate the "Value of Information"?
- Explain the concept of "Perfect Information"
- How can we use the value of "Perfect Information"

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Question 11: Decision Analysis

- Explain the structure of a Decision Tree
- What information should be attached to a decision tree?
- From your experience, is it easy or difficult to set up a decision tree correctly? Explain your reasons for your answer.

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IDS.333 Risk and Decision Analysis
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