SOEN 342 Software Requirements Specifications

Fall 2015

Midterm Exam I – Example Questions

Name: _____ Total Points:

ID: _____ _____ / ____

Instructions. *This example SOEN 342 Midterm contains questions from previous years that you can use to test your preparation. Note that the midterm is a* ***closed book*** *exam. The real exam will contain more questions: about 4-5 larger questions that you will need to solve in about 5–15mins, plus some multiple-choice questions. Also, note that the actual midterm will not necessarily cover the same questions as the ones here (or even the same type of questions)!*

- This is a closed book, 60 min. exam
- **Do not** detach any pages from this exam!
- Check if your booklet has all 7 pages
- The only allowed tool is an ENCS-approved calculator
- Provide all answers in this booklet
- You will get marks for brief and precise answers. You will not get marks for long essays or for information that is correct but does not answer the question.
- If you leave the room, you must submit your exam and cannot return until the end of the exam period

(2pts) **1.** Name five *defects* that can appear in a requirements document and provide a one-sentence definition for each.

2 pts

1. Name: _____

   Definition: _____

2. Name: _____

   Definition: _____

3. Name: _____

   Definition: _____

4. Name: _____

   Definition: _____

5. Name: _____

   Definition: _____

(1pt) **2.** When doing an interview with a stakeholder (e.g., user), the following is **NOT** recommended: *(Check only one answer)*

1 pt

- ☐ Preparing for the interview (e.g., review of domain documents)
- ☐ Using an interview template
- ☐ Asking the users directly about their needs
- ☐ Starting by presenting a solution to the stakeholder's problems
- ☐ Asking context-free questions

(1pt) **3.** To be *complete*, a decision table with N input conditions must have: *(Check only one answer)*

1 pt

- ☐ N columns
- ☐ $2 \cdot N$ columns
- ☐ N^2 columns
- ☐ $\frac{N}{2}$ columns
- ☐ 2^N columns

(3pts) **4.** Consider the following interaction matrix:

	3 pts

Statement	S1	S2	S3	S4	Total
S1	0	1000	1	1	
S2	1000	0	0	1	
S3	1	0	0	1	
S4	1	1	1	0	
Total					

Here, S_{ij} =

- 1: conflict
- 0: no overlap
- 1000: no conflict

(a) (1 pt) Compute the values for the total row and column and insert them in the table above.

(b) (1 pt) Use the formula discussed in the lecture to compute the total number of *conflicts*: _____

(c) (1 pt) Use the formula discussed in the lecture to compute the total number of *non-conflicting overlaps*: _____

(7pts) **5.** Consider the following Defect Detection Prevention (DDP) risk-consequence table for a library loan management system:

7 pts

Objectives	**Risks**				**Loss of objective**
	Late returns (likelihood: 0.6)	Stolen copies (likelihood: 0.3)	Lost copies (likelihood: 0.1)	Long loan by staff (likelihood: 0.5)	
Regular availability of book copies (weight: 0.4)	0.40	0.60	0.60	0.20	
Comprehensive coverage of library (weight: 0.3)	0	0.20	0.20	0	
Staff load reduced (weight: 0.2)	0.30	0.50	0.40	0.10	
Operational costs decreased (weight: 0.1)	0.10	0.30	0.30	0.10	
Risk criticality					

With

$$Criticality(r) = Likelihood(r) \times \sum_{obj} (Impact(r, obj) \times Weight(obj))$$

and

$$Loss(obj) = Weight(obj) \times \sum_{r} (Impact(r, obj) \times Likelihood(r))$$

(a) (1 pt) What is the meaning of a single table entry, i.e., of each pair (obj, r)?

- ☐ (estimated) loss of satisfaction of objective *obj* if risk r occurs
- ☐ relative cost to recover objective *obj* if risk r occurs
- ☐ this is the risk-reduction leverage (RRL)
- ☐ the (estimated) reduction of risk r under objective *obj*
- ☐ None of these options

(b) (2 pts) Compute the values for *Loss of objective* and enter them in the last column of the table.

(c) (2 pts) Compute the values for *Risk criticality* and enter them in the last row of the table.

(d) (1 pt) Which *objective* is most at risk?

- ☐ Regular availability of book copies
- ☐ Comprehensive coverage of library
- ☐ Staff load reduced
- ☐ Operational costs decreased
- ☐ None of these options

(e) (1 pt) What is the *highest risk* overall? _____

(8pts) **6.** You are the requirements engineer in an information system project for a video rental store. Simplifying assumptions and details:

8 pts

- It is a stand-alone store, not part of a larger organization.
- Rents only videos, not computer games or other items.
- A "video" can be in any medium: tape, DVD, and so on.
- The rental charge may vary by medium. For example, DVD rentals are more expensive than tapes.
- The store does not sell anything. For example, there are no sales of videos or food.
- All transactions are rentals.
- The input medium by which membership and video rentals are captured is not important.
- Cash-only payments.
- On completion of a rental, the customer receives a transaction report with 'typical' information on it (use your judgement).
- Each renter has a separate membership.

(a) (1 pt) Identify 4 *actors* and give a brief description (3–5 words) for each

- **Actor 1:** Name: _____

  Description: _____
- **Actor 2:** Name: _____

  Description: _____
- **Actor 3:** Name: _____

  Description: _____
- **Actor 4:** Name: _____

  Description: _____

⇒ ***Continued on next page!***

(b) (2 pts) Identify four primary (user-goal level) use cases and related actors (identified by A1, A2 etc.):

- **UC1** Name: _____ Actors: _____
- **UC2** Name: _____ Actors: _____
- **UC3** Name: _____ Actors: _____
- **UC4** Name: _____ Actors: _____

(c) (1 pt) Draw the UML use case context diagram for your actors and use cases:

⇒ ***Continued on next page!***

(d) (3 pts) Write the use case (steps only, no additional details like pre- and postconditions) for "Rent Video" in *essential* style, for the main success scenario (basic flow):

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. ...

(e) (1 pt) Write two extensions (alternative scenarios) for the "Rent Video" use case. Provide the step number in the main success scenario and a brief description.

- _____ : _____
- _____ : _____