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Department of Computer Science and Engineering
College of Engineering, University of Nevada, Reno

CS426 / CPE426 Senior Projects

Midterm Test

April 6, 2006

Test type: Closed-book exam **Number of questions:** 7 **Total points:** 42 **Weight in course grade:** 15%

- 1** Briefly describe *your team's project* in CS426/CPE426 (7 to 10 lines description) and indicate what are its innovative features (at least 3 expected). In addition, indicate why you think your project is worthwhile, what are the main challenges related to completing it, what is its current status, and what future work you see associated with it beyond the timeframe of the course. [8 points]
- 2** Explain why UML is considered to be a *unified* modeling language for software systems. [4 points]
- 3** Explain what is meant by an *interface* and by a *subsystem* and indicate the UML notation for them. Also, in connection with them, describe the *layering pattern* for architectural design. [7 points]
- 4** Indicate what a *project glossary* is and why is it this useful. Give five examples of terms that are included in your team project's glossary. Explain the meaning of each term. [5 points]
- 5** Outline the CRC (*Class-Responsibilities-Collaborators*) analysis technique for finding analysis classes in object-oriented modeling. [5 points]
- 6** CHOICE: Consider the following types of design diagrams. Answer either (a) or (b), but not both:
 - (a) Indicate the UML notations for *activity diagrams* (start and stop states, action states, sub-activity states, transitions, decisions, forks, joins, and swimlanes). Give an example of an activity diagram that includes at least 6 action states, a fork, a join and two swimlanes. Provide some additional (text) description to your activity diagram to explain its meaning.
 - (b) Indicate the UML syntax for *statechart diagrams*, (detailed syntax for states and detailed syntax for transitions) and enumerate the four types of event that trigger transitions (note that you need not explain each type of event). Give an example of statechart diagram that has at least 6 states (not counting start and stop states). Provide some additional (text) description to your statechart diagram to explain its meaning. [7 points]
- 7** Regarding *advanced statecharts*:
 - Explain what is meant by a composite state and indicate the main types of composite states;
 - Briefly describe the two types of submachine communication (via attributes and via sync states);
 - Explain what is meant by shallow history and by deep history.[6 points]

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