National Exams December 2013

04-Soft-A7, Software Process

3 hours duration

NOTES:

1. If doubt exists as to the interpretation of any question, the candidate is urged to submit with the answer paper, a clear statement of any assumptions made.

2. This is an OPEN BOOK EXAM.
   Any non-communicating calculator is permitted.

3. FIVE (5) questions constitute a complete exam paper.
   The first five questions as they appear in the answer book will be marked.

4. Each question is of equal value.

5. Most questions require an answer in essay format. Clarity and organization of the answer are important.

1.
   a) What is software process? Identify and describe very briefly (1-2 lines) activities, which are common for all software processes.
   b) List three software development process models you know and describe them very briefly (1-2 lines).
   c) What are umbrella activities? Identify five umbrella activities which you consider as most important.

2.
   a) Identify and describe briefly (3-4 lines) major project management activities.
   b) What is agile software development?
   c) Compare and contrast project management activities in two cases: (1) if you use the Waterfall model and (2) agile development.

3.
   a) Three main sets of activities for dealing with risk are: risk mitigation, risk monitoring, and risk management. Describe each set of activities very briefly (1-2 lines).
   b) Assume that you are a project manager of a relatively small software development company. Upon completion of the implementation phase 50% of the testing team left the company. How would you manage this risk? Would the use of agile software development help to manage this risk?

4. Assume you are managing development of an information search and delivery tool, which must deliver electronic documents from a repository to a user according to some key words and user's preferences (for instance, information from a product catalog or classified advertisements).
   a) Draw a UML diagram representing three use cases: setting the user's preferences, document search, and document selection and delivery.
   b) Draw a UML sequence diagram for the "setting the user's preferences" use case.
   c) If agile development is used, would you change software specifications or just focus on implementation?

5. To estimate the cost of the project in question #4 using the Function-Point approach, define counts:

	Simple	Average	Complex	Total
External Inputs				
External Outputs				
External Inquiries				
Internal Logical Files				

External Interface Files				
Count_total				

- Assign weights for Simple, Average and Complex arbitrarily, but reasonably.
- What is the purpose of adjustment values in the Function-Point approach to software project cost estimation?

6.
   a) Describe briefly (2-3 lines) testing strategies, which you know.
   b) Explain what are: unit testing, integration testing, and system testing.
   c) Explain the difference between verification and validation.
   d) Compare and contrast the procedures of verification and validation in two cases: (1) if you use the Waterfall model and (2) agile development.

7.
   a) What is meant by the configuration of the software system? Illustrate your answer by detailing the configuration of the software system in question #4.
   b) Identify and describe briefly (1-2 lines) the main activities of the process of making change.
   c) How would activities of the process of making change differ in two cases: (1) if you use the Waterfall model and (2) agile development?

8.
   a) Compare and contrast software development and software maintenance.
   b) When maintenance activities must begin?
   c) Why maintenance is expensive?
   d) What are the goals of reverse engineering? What are the goals of restructuring? What benefits can be derived from reusing software?

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Marking Scheme

1.   a) 2 marks
      b) 3 marks
      c) 5 marks

2.   a) 5 marks
      b) 2 marks
      c) 3 marks

3.   a) 5 marks
      b) 5 marks

4.   a) 4 marks
      b) 3 marks
      c) 3 marks

5   10 marks

6.   a) 2 marks
      b) 3 marks
      c) 3 marks
      d) 2 marks

7.   a) 4 marks
      b) 3 marks
      c) 2 marks

8.   a) 3 marks
      b) 2 marks
      c) 2 marks
      d) 3 marks