National Exams December 2014

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. Candidates may use any non-communicating calculator.

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 short written answers. Clarity and organization of the answer are important, but full sentences are NOT required. Be sure to bullet lists and ideas wherever possible.

1.
   a) What is software process? How the process can be typically decomposed?
   b) What are definitions of software process metrics and project measures?
   c) Briefly describe the spiral software process model. Identify a situation in which the spiral process is likely to be used. Identify the main drawback of the spiral process.

2.
   a) What is the main objective of project planning? What does the software scope describe?
   b) What is agile software development?
   c) Compare and contrast the project planning activities in two cases: (1) if you use the Waterfall model and (2) agile development.

3. Assume the project duration is estimated as eight weeks. Draw a brief Gannt diagram (timeline chart) for two process models (a) and (b). The project schedule must include managerial, development, and quality assurance activities. You do not need a grid paper; indicate the duration of each stage in days approximately.
   a) Waterfall model.
   b) Agile development with 2-week sprints.

4. Assume you are managing development of an emergency reporting system, in which the field officer reports an emergency situation, and the dispatcher must record the issue and allocate recourses.
   a) Draw a UML use case diagram modeling the system. Define entry and exit conditions, and quality requirements.
   b) Draw a UML class diagram for the 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 the 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.
- Chose five adjustment factors, and assign values to them.

6.

a) List and briefly describe the technical activities for testing?
b) List and briefly describe unit testing techniques.
c) What are testing stubs and drivers and .how they are used in testing strategies?
d) List the system testing activities.

7.

a) What is meant by the configuration of the software system? What is the variant management?
b) Identify and briefly describe briefly the main configuration management activities
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) What is the difference between software evolution and maintenance?
c) What is version control?
d) What is the difference between re-engineering and reverse engineering?

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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