**King Mongkut's University of Technology Thonburi**

**Final Exam, Academic Year 2010**

**COURSE CPE** 333 Software Engineering **Computer Engineering Departments, 3rd Yr.**

**Monday 7 March 2011** **09.00-12.00 h.**

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**Instructions:**

1. This examination contains 2 parts, 10 pages (including this cover page).
2. Students are to solve allthe problems
3. The answers must be written in the space provided in this exam paper.
4. One sheet of A4 note paper is allowed.
5. All electronic devices and books are **not** allowed.

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Name_____ ID _____

**Part I: Multiple choices (1 point awarded for each correct answer, 0.5 point deducted for each wrong answer)**

1. What does it mean to say that requirements should be quantifiable?

   a) It should be possible to link each feature in the design back to the specific requirement that it implements.
   b) It should be possible to express the requirement in a formal or semi-formal notation, such as a sequence diagram.
   c) It should be possible to measure whether the requirement is satisfied by the system.
   d) All of the above.

2. Which is the most important factor to be considered during acceptance test?

   a) Schedule of system delivery
   b) Ability to benchmark the system
   c) Match with requirements
   d) Error handling method

3. What is configuration management in software engineering?

   a)Overall management of the design of the system
   b)The identification of the software system configuration at discrete points in time to control changes to the system
   c) Management of the configurable components in a system
   d) In object-oriented programming, the management of objects that control the configuration of some other function(s) in the system

4. What is the purpose of a test case specification in software engineering?

   a) To specify the sequence of actions for the execution of a test
   b) To specify inputs, predicted results, and a set of execution conditions for a test item
   c) To list the test procedures to be performed on the integration of the software with hardware
   d) To list the specific tests to be conducted on the integration of each software module with other modules

5. What is not one of the reasons why performance and/or load testing is not adequately performed during acceptance testing?
   a)Users are unable to project how the new system will be used in terms of files sizes, transaction sizes, peak periods, etc.
   b) Vendors are unable to assume the risk of guaranteeing performance when the user is unable to quantify system performance parameters.
   c) Users rely on vendor performance formulas and statistics based on an average company, not their company.
   d) Vendors are unwilling to assume the risk of having hidden bugs in their code cause the test to fail.

6. What is regression testing?

   a) Testing that is done so that the user or customer can decide whether the software meets the specifications
   b) Testing that is done to determine whether a single function or a module works correctly.
   c) Testing which verifies that all current and previously released functions are all working correctly.
   d. All of the above.
   e. None of the above.

7. Which of the following statement is false?

   a) Good coding standard can lead to software robustness.
   b) Software validation should be done in all phases across the software life cycle.
   c) Good software testing methodology can provide an absolute certainty about the system correctness.
   d) None of the above

8. What is not true about the waterfall process model?

   a) It emphasizes testing and risk analysis.
   b) It is a traditional process that values structure and sequence of activities.
   c) It is not very practical for use in today's software development environment.
   d) All activities must have prerequisite.
   e) None of the above

9. Which of the following processes/methodologies use a four phased approach; Inception, Elaboration, Construction, and Transition ?

   a) Rational Unified Process
   b) Waterfall
   c) Extreme Programming
   d) Boehm's Spiral
   e) None of the above

10. Which of the following statement is false?

   a) Both RUP and Extreme Programming emphasize iteration
   b) Both RUP and Extreme Programming emphasize design
   c) Both RUP and Extreme Programming produce many artifacts
   d) a and b
   e) b and c
   f) None of the above

11. Which statement is false?

   a) Use case diagrams shows the system functionalities and system users.
   b) Sequence diagrams displays how the processes are carried out in small steps and the order of these steps.

c) Collaboration diagrams represent interactions between objects using a series of sequenced messages.
d) Both Sequence and Collaboration diagrams provide the global view of the system's functionalities.
e) None of the above

12. Which of the following issues is most closely related to deployment of a software system?

a) Layout of user interface screens
b) Choice of programming language and platform
c) Communication protocols
d) Migrating databases from legacy systems
e) Setting up a source code repository
f) All of the above

13. "A set of specific association between the components and connectors of a software system's architecture" is the definition of which of the following concept:

a) Components
b) Coordination
c) Configuration
d) Connections

14. Which of the following is a characteristic of a highly modular software design?

a) Strong Cohesion, Strong Coupling
b) Strong Cohesion, Weak Coupling
c) Weak Cohesion, Strong Coupling
d) Weak Cohesion, Weak Coupling

15. Which of the following is not an Architectural pattern discussed in the lectures

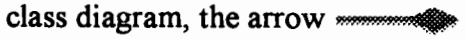
a) State-Logic-Display
b) Basic Interpreter
c) Event-Based
d) Batch-and-Pipe
e) Multi-tiered Architecture

16. Which of the following UML diagram is best suited for describing the operational step-by-step workflows of a components in a system, and is often used to show overall flow of control?

a) Statechart diagram
b) Sequence diagram
c) Use case diagram
d) Activity diagram

17. Which of the following is not an advantage of Component Based software re-use model?

a) Easy to develop
b) Support asynchronous behavior
c) Platform independence
d) Support distributed platform

18. In class diagram, the arrow  represent what type of relationship?

a) Is-A
b) Has-A
c) Association
d) Generalization
e) Composition

19. Which of the following is the least important characteristic of a large multiple release software projects?

a) Performance
b) Correctness
c) Readability
d) Traceability
e) Maintainability
f) Completeness

20. Of the following, which type of comment should be most avoided?

a) Code marker
b) Explanation of the code
c) Summary of the code
d) Description of the code intent

21. Which of the following is not an advantage of Git?

a) Efficient merge operation
b) Support distributed model
c) Fast
d) Compact
e) Compatible with many GUI tools

22. Which of the following statement about SCM is false?

a) An SCM can helps to keep track of who works on which files
b) An SCM allows multiple programmers to work on the same project concurrently
c) When a file is locked by a programmer, no one else can check out that file

d) During the merge operation, if a conflict is discovered, SCM will not allow the programmer to submit the file
e) New revision is automatically created every time a change is made to a file in the repository

23. Which is not a feature of Build Automation Tool?

a) Automatically discover files and object dependencies
b) Automatically perform debug and report software errors
c) Automatically perform regression test on the built system
d) Automatically generate documentation
e) Automatically deploy the solution

24. Which is a limitation of SVN?

a) Every user must use the same version of Operating Systems to commit to an SVN repository
b) Users must update before commit changes to the SVN repository
c) User must be in the same network as the server to connect to the repository
d) Installing SVN on servers require administrative privilege

25. Which is not a benefit of SVN tool?

a) Programmer no longer needs to maintain local copy of the source code
b) Programmer can share code with team members
c) Programmer can easily send test files to other programmers
d) Programmers can collaborate on the same source code effectively

26. Which is not a function of Quick Test Pro?

a) Defining check point to tract variables during test
b) Using loop to repeat test
c) Develop mind map diagram of the test scenario
d) Defining condition to test during a test case

27. Which of the following type of program cannot be tested using Quick Test Pro?

a) Web Application
b) Java Application
c) C# Application
d) File Transfer Application

28. In project scheduling, what is the Critical Path?

a) The series of dependent tasks with the longest total estimated effort
b) A series of dependent tasks with zero float
c) A set of tasks that will cause the project to be late if any task in the set is delayed or takes longer than estimated to complete
d) All of the above
e) None of the above

29. Suppose that a task is estimated to require 15 days of effort. If you assign that task to an experienced developer who is 25% more productive than average (productivity factor 1.25), how long would you expect her to take to finish the task?

a) 10 days
b) 8 days
c) 12 days
d) 20 days
e) 5 days

30. Definition: in project scheduling, the difference between the date and time a task actually begins and the date and time it is finished. Of which term is this the definition?

a) Effort
b) Duration
c) Calendar time
d) Finish-to-Start (FS) dependency
e) None of the above

Answer

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|---|---|---|
| 1 _____ | 11 _____ | 21 _____ |
| 2 _____ | 12 _____ | 22 _____ |
| 3 _____ | 13 _____ | 23 _____ |
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| 9 _____ | 19 _____ | 29 _____ |
| 10 _____ | 20 _____ | 30 _____ |

**Part II: Design Problem**

You are responsible for the software development of a building security system. The system consist of three major components, fingerprint door lock systems, network, and a server that provides authentication information to the fingerprint door lock component situated near a door.

Each door lock systems consist of a fingerprint reader, a sensor that detects whether the door is opened or closed, a sensor that detects whether the door is locked or not, and an actuator that engage the lock on the door. The fingerprint reader generate request to the servers to authenticate when a finger is pressed, and controls the sensors and actuator to lock or unlock the door.

The system should have the following features:

1. The system consist of 4 security levels 1-4
2. Every user has a unique user id, each user is a member of a security level (1-4)
3. Every lock has a unique lock id, each lock is given a level of security (1-4)
4. The data about user security level is stored on the server
5. When a fingerprint reader is pressed, it sends the finger print id to the server to check if the user has access, if so, disengage the lock for 8 seconds.
6. If the door is opened for more than 30 seconds, the server should be notified
7. The server should keep track of all current lock/unlock status of all the doors in the buildings
8. The server should keep a history of all of the successful and fail access attempts at every door.

Your task as software developer is to:

1) Choose a scenario in the system, and draw a diagram that describe the scenario using sequence or activity diagram (Choose one, don't draw both).

2) Describe a software architecture you would choose as a design for the system, **OR** draw a class diagram of the components of the system. (Choose one, class diagram or architectural description, not both.)