Semester One of Academic Year (2015---2016) of BJUT

《Software Methodology》

Module Code: COMP3017J

Exam Paper A

Exam Instructions: Answer ALL Questions

Honesty Pledge:

I have read and clearly understand the Examination Rules of Beijing University of Technology and University College Dublin and am aware of the Punishment for Violating the Rules of Beijing University of Technology and University College Dublin. I hereby promise to abide by the relevant rules and regulations by not giving or receiving any help during the exam. If caught violating the rules, I would accept the punishment thereof.

Pledger: _____ **Class No:** _____

BJUT Student ID: _____ **UCD Student ID**_____

Notes:

The exam paper has 3 parts on 6 pages, with a full score of 100 points. You are required to use the given Examination Book only.

Instructions for Candidates

Full marks will be awarded for complete answer to **All** questions.

Instructions for Invigilators

Candidates are allowed to use non-programmable calculators during this examination.

Obtained score

Part 1: single-choice questions (2'*25=50 points)

1. Which question no longer concerns the modern software engineer?
A) Why does computer hardware cost so much?
B) Why does software take a long time to finish?
C) Why does it cost so much to develop a piece of software?
D) Why can't software errors be removed from products prior to delivery?

2. Software is a product and can be manufactured using the same technologies used for other engineering artifacts. Is this true or false?
A) True
B) False

3. Software deteriorates rather than wears out because
A) Software suffers from exposure to hostile environments
B) Defects are more likely to arise after software has been used often
C) Multiple change requests introduce errors in component interactions
D) Software spare parts become harder to order

4. WebApps are a mixture of print publishing and software development, making their development outside the realm of software engineering practice. Is this true or false?
A) True
B) False

5. Which of the items listed below is not one of the software engineering layers?
A) Process
B) Manufacturing
C) Methods
D) Tools

6. Software engineering umbrella activities are only applied during the initial phases of software development projects. Is this true or false?
A) True
B) False

7. Which of these are the 5 generic software engineering framework activities?
A) communication, planning, modeling, construction, deployment
B) communication, risk management, measurement, production, reviewing
C) analysis, designing, programming, debugging, maintenance
D) analysis, planning, designing, programming, testing

8. The essence of software engineering practice might be described as understand the problem, plan a solution, carry out the plan, and examine the result for accuracy. Is this true or false?

A) True
B) False

9. Most software development projects are initiated to try to meet some business need. Is this true or false?

A) True
B) False

10. The waterfall model of software development is

A) A reasonable approach when requirements are well defined.
B) A good approach when a working program is required quickly.
C) The best approach to use for projects with large development teams.
D) An old fashioned model that is rarely used any more.

11. Bottom-up integration testing has as it's major advantage(s) that

A) major decision points are tested early
B) no drivers need to be written
C) no stubs need to be written
D) regression testing is not required

12. The spiral model of software development

A) Ends with the delivery of the software product
B) Is more chaotic than the incremental model
C) Includes project risks evaluation during each iteration
D) All of the above

13. Requirements engineering is a generic process that does not vary from one software project to another. Is this true or false?

A) True
B) False

14. Which of the following is not one of the context-free questions that would be used during project inception?

A) What will be the economic benefit from a good solution?
B) Who is behind the request for work?
C) Who will pay for the work?
D) Who will use the solution?

15. Which of these is not an element of a requirements model?

A) Behavioral elements
B) Class-based elements
C) Data elements
D) Scenario-based elements

16. The entity relationship diagram
A) depicts relationships between data objects
B) depicts functions that transform the data flow
C) indicates how data are transformed by the system
D) indicates system reactions to external events

17. Control flow diagrams are
A) needed to model event driven systems.
B) required for all systems.
C) used in place of data flow diagrams.
D) used to represent system behavior.

18. Which of the following is not a characteristic common to all design methods?
A) configuration management
B) functional component representation
C) quality assessment guidelines
D) refinement heuristics

19. Cohesion is a qualitative indication of the degree to which a module
A) can be written more compactly.
B) focuses on just one thing.
C) is able to complete its function in a timely manner.
D) is connected to other modules and the outside world.

20. Which of the following is not an example of infrastructure components that may need to be integrated into the software architecture?
A) Communications components
B) Database components
C) Interface components
D) Memory management components

21. In the context of object-oriented software engineering a component contains
A) attributes and operations
B) instances of each class
C) roles for each actor (device or user)
D) set of collaborating classes

22. Which of these is a graphical notation for depicting procedural detail?
A) box diagram
B) decision table
C) ER diagram
D) flowchart

23. Several common design issues surface for almost every user interface including
A) adaptive user profiles
B) error handling
C) resolution of graphics displays
D) system response time
E) both b and d

24. A pattern language
A) encompasses a collection of patterns
B) is implemented using hypertext
C) resembles the structure of natural languages
D) None of the above

25. Which of the following is not one of the attributes of software quality?
A) Adds value for developers and users
B) Effective software process creates infrastructure
C) Removes need to consider performance issues
D) Useful products satisfy stakeholder requirements

Obtained score

Part 2: fill-in-the-blank questions (2'*5=10 points)

1. The Five SCM (Software Configuration Management) tasks are: Identification, _____, change control, _____, reporting.

2. A CRC card includes three main items: class name, class collaborators, and _____.

3. The concepts and techniques discussed for architectural design, _____, and user interface design can be used in the conjunction with a pattern-based approach.

4. WebApp design quality includes the following indicators: usability, functionality, _____, efficiency, and maintainability.

5. User satisfaction = compliant product + _____ + delivery within budget and schedule
(note: "+" is plus sign)

Obtained score

Part 3: short-answer questions (40 points)

1. There are four types (levels) of testing. What are they?

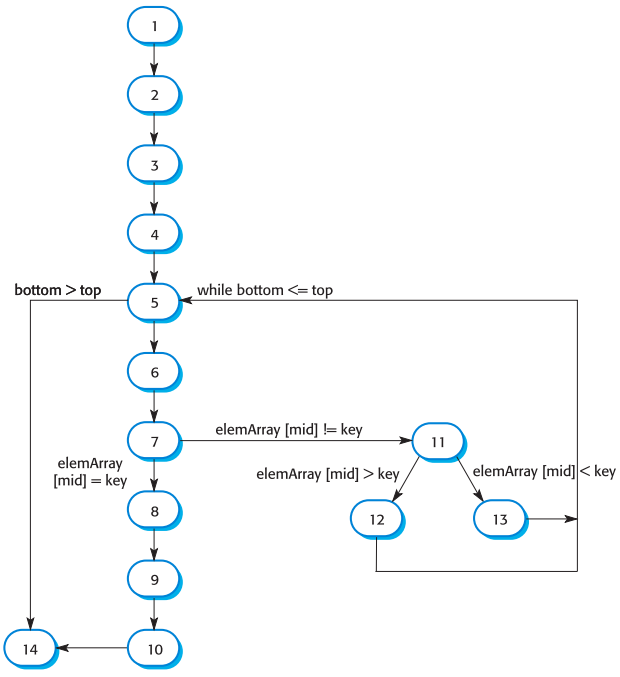
2. List the four design models required for a complete specification of a software design and the role of each.

3. Describe the three Golden Rules for user interface design.

4. Assume you want to buy a cellphone on an online shop (like JD.com), please draw a use-case diagram for this scenario.

5. How do architectural patterns differ from component patterns?

6. Look at the following flow chart, specify the predicate nodes and number of regions, list all the independent paths, calculate cyclomatic complexity V(G).



7. The usage of a computer is as follows:
work 100 hours, and then broken (3 hours for repairing), and then work 120 hours, and then broken (2 hours for repairing), and then work 140 hours, and then broken (4 hours for repairing)
Please compute the MTBF (mean-time-between-failure) and MTTR (mean-time-to-repair).