Practice Exam Notes

- The real final exam will have similar multiple-choice questions in terms of both format and content covered but they will not be identical to the questions in this document.
- The final exam will also have a short answer section. The short answers questions will be similar to the in-class activities (e.g. making UML diagrams, use cases, calculating cyclomatic complexity, JavaDoc, JUint, etc.).

Part I: Multiple Choice

Circle the BEST answer. If more than one answer makes sense, pick the BEST one.

1) From the following which would be the BEST definition to explain software?
   A. Software is something tangible and can be used in a system.
   B. Software is a logical element of the system.
   C. Software is both a logical and physical element of the system.
   D. Software is a physical element of the system.

2) Which of the following is NOT a reason we spend so much time and effort maintaining existing programs:
   A. Errors in delivered software must be corrected.
   B. Changes to technical standards, operating systems, etc. cause new or unexpected errors that need to be corrected.
   C. Poor documentation takes longer to reverse engineer and fix.
   D. Poor useability or user level documentation; must provide additional support to users.
   E. Development tools do not work as expected.

3) Which of the following is **NOT** a category of the seven software application domains?
   A. System software
   B. Web/Mobile applications
   C. Tertiary software
   D. Embedded software
   E. Artificial Intelligence Software

4) Application software includes applications such as:
   A. Microsoft Word, Photoshop, and Minecraft (video game).
   B. Matlab, Autocad, and PSpice.
   C. Windows, Linux, compilers.
   D. YouTube, OWL, TikTok
   E. Self-driving cars, image recognition, decision making systems.

5) The Software Engineering Layer "Methods" describes:
   A. The technical "how-to's" for building software.
   B. The tools that aid in automation and support of software engineering processes.
   C. The foundational Layer of software engineering and holds everything together.
   D. A commitment to quality.
   E. Methods for unit testing software.

6) Fill in the blanks. The following _____ resides within a product or system.
   A. Embedded software
   B. System software
   C. Application software
   D. Product-line software

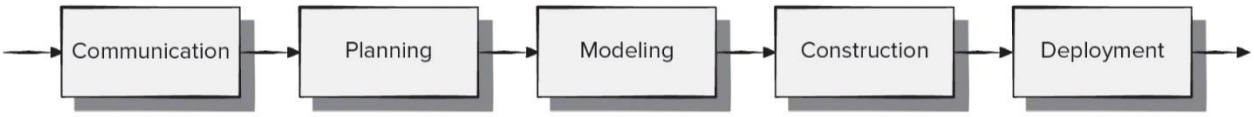
7) A task in the generic process framework can best be defined as:
   A. a collection of activities and actions that are performed when some work product is to be created.
   B. strives to achieve a broad objective and is applied regardless of the application domain, size, complexity, etc.
   C. focusing on small, but well-defined objectives that produces a tangible outcome.
   D. encompasses a set of tasks that produce a major work product.
   E. the review process of evaluating various software engineering work products.

8) Which one of the following is **NOT** an Umbrella Activity:
   A. Software project tracking and control
   B. Deployment
   C. Risk management
   D. Technical reviews
   E. Measurement

9) George Polya outlined the essence of software engineering practice as:

A. Plan a solution that includes modeling and software design.
B. Understand the problem, plan a solution, carry out the plan, and examine the result for accuracy.
C. Understand the problem, plan a solution, and carry out the plan.
D. Understand the problem including the communication and analysis.

10) The five key software process activities are always performed in the same order and linearly.
A. True
B. False



11) The above diagram depicts this software process flow:
A. Linear Process Flow
B. Iterative Process Flow
C. Evolutionary Process Flow
D. Parallel Process Flow
E. Spiral Process Flow

12) Which of the following is a possible stakeholder group for the OWL Migration project discussed in-class:
A. Medical doctors at sick kids in Toronto.
B. The city of London Ontario.
C. The government of Ontario.
D. Parks Canada
E. Western University students and faculty.

13) In what way does the unified process model differ from other models?

A. The unified process begins by describing the customer's interaction with the system.
B. The unified process provides a graphical representation of the system to be designed.
C. The unified process recognizes the importance of customer communication and streamlined methods for describing the customer's view of a system.
D. The unified process allows for easy understanding of the different transition stages within the system.

14) From the following which BEST explains the term "process flow"?
A. Describes how the framework activities and the actions and tasks that occur within each framework activity are organized with respect to sequence and time.
B. Describes the execution of one or more activities in parallel with other activities.
C. Describes how activities repeat before proceeding to the next.
D. Describes the execution of each of the five framework activities in sequence, beginning with communication and culminating with deployment.

15) Which of the following is a Prescriptive Process Model:
A. Scrum Model
B. XP Model
C. DevOps Model
D. V-Model
E. Evolutionary Process Flow

16) An issue with the Prototyping Process Model is that:
A. Temptation to "ship" a prototype.
B. Testing occurs late in the process.
C. It is essentiality the same as the waterfall model.
D. Overlapping phases can cause problems.
E. It does not accommodate change well.

17) What is the main purpose of a daily scrum meeting?
    A. The daily scrum meeting allows the stakeholder to try the current daily build and give feedback.
    B. The daily scrum meeting allows for discussions on technical problems found since the last team meeting.
    C. The daily scrum meeting allows the workflow to be synchronized and make plans for the next 24 hours.
    D. The daily scrum meeting asks what items will be added to the backlog.

18) Within a scrum, a sprint is a short time-boxed period of time. Which of the following would you classify as a "sprint"?
    A. Work that has been running at an even pace but then finishes quickly at the end.
    B. Work that takes place within a relatively short time frame.
    C. Work that starts off fast, as in a sprint, but then slows down to a steady pace.
    D. Work that races along quickly to a given point irrespective of whether it gets finished.

19) An issue with the DevOps methodology is that:
    A. It is difficult to control the cost of changes.
    B. Temptation to "ship" a prototype.
    C. Developer reluctance to use measurement.
    D. Heavy reliance on automated tools to be effective.

20) Which of the following would describe the meaning of a scrum team in software development?
    A. A scrum team is an independent SQA team and conducts tests and quality assurance activities on an active software development project.
    B. A scrum team is a loose team of people that can come and go in the development stage and often have no formal project title.
    C. A scrum team is a self-organizing interdisciplinary team consisting of a product owner, a scrum master, and a small development team.
    D. A scrum team is a group of stakeholders invested in the product.

21) Which of the following is a positive for using scrum?
   A. Owner sets priorities.
   B. Suitable for large teams.
   C. Expert team members.
   D. Cost control of changes.

22) Scrum principles are used to guide development activities within a process that incorporates the following framework activities:
   A. Requirements, analysis, design, evolution, delivery.
   B. Proposal, evolution, analysis, delivery
   C. Design, requirements, evolution, distribution
   D. Requirements, analysis, evolution, delivery

23) The XP framework encourages the use of:
   A. A board that shows all project tasks.
   B. Pair programming.
   C. Continuous integration.
   D. Daily, weekly, and monthly meetings.

24) This type of maintenance deals with keeping software usable in a changing environment:
   A. Corrective maintenance
   B. Adaptive maintenance
   C. Perfective maintenance
   D. Preventive maintenance
   E. Scope maintenance

25) Which of the following would NOT be considered an essential part of the Go No Go Decision making to continue with the prototype development?
   A. The project risk of exceeding its budget becomes high.
   B. The project must be delivered at any cost.
   C. The risk of the project failing to meet its target objectives.
   D. The risk of missing the delivery date.

26) Which of the following is NOT a key principle for communication?
    A. If something is unclear, draw a picture.
    B. Ensure all meetings are at least 30 minutes long.
    C. Face-to-face communication is best.
    D. Prepare before you communicate.
    E. Someone should facilitate the activity.

27) What are primary actors?
    A. Primary actors are considered more important than secondary actors.
    B. Primary actors are any stakeholder of the system.
    C. Primary actors are only human.
    D. Primary actors support the system so that secondary actors can do their work.
    E. Primary actors are any person or system external to the system who provides input/output.

28) An example of a Non-Functional Requirement would be:
    A. The user interface must be intuitive and easy to use.
    B. The Sales system should allow users to record customers sales.
    C. The system must support multiple users and allow them to login to the application via a login screen.
    D. Users can create bookmarks of their favorite webpages.
    E. The system sends an approval request after the user enters personal information.

29) Which of the following is NOT a requirements engineering task?
    A. Architectural design
    B. Inception
    C. Specification
    D. Validation
    E. Elaboration

30) This requirements monitoring task uncovers errors and determines their cause:
    A. Distributed debugging
    B. Run-time verification
    C. Run-time validation
    D. Business activity monitoring
    E. Evolution and codesign

31) This conflict resolution technique asks all stakeholders involved with the conflict itself to vote on a set of alternative options.
    A. Agreement
    B. Compromise
    C. Overruling
    D. Voting
    E. Stakeholder determinism

32) Which of the following is NOT part of the requirements models?
    A. Class-oriented models
    B. Behavioural models
    C. Flow-oriented models
    D. Interactive models
    E. Data models

33) CRC cards are used in this kind of modeling:
    A. Data modeling.
    B. Flow modeling.
    C. Events modeling.
    D. User interface modeling.
    E. Class modeling.

34) When performing a grammatical parse to develop Analysis Classes, nouns become potential:
    A. Methods
    B. Interfaces
    C. Attributes
    D. Classes
    E. Packages

35) This diagram can be used for scenario modeling:

A. UML Class diagram.
B. UML Use Case diagram.
C. Entity Relationship Diagram (ERD).
D. UML State Diagrams.
E. Data Flow Diagram (DFD).

36) Good software design should exhibit:
A. High coupling, High cohesion.
B. Low coupling, High cohesion.
C. Low coupling, Low cohesion.
D. High coupling, Low cohesion.

37) At the lowest level of _____ a solution is stated in specific terms using pseudocode.
A. Modularity
B. Architecture
C. Refactoring
D. Abstraction
E. Coupling

38) Technical Debt is best described as:
A. Costs associated with rework caused by choosing “quick and dirty” solution.
B. Unpaid wages to technical workers.
C. Costs associated with purchasing hardware and software for the development team.
D. Costs associated with not maintaining hardware that supports the development team.
E. Payments owing on loans taken out to fund development.

39) Work products from the design activity act as a blueprint for this activity:
A. Communication
B. Planning
C. Deployment
D. Construction
E. Maintenance

40) The design concept is a top-down design strategy originally proposed by Niklaus Wirth to successively refining levels of procedural detail.
    A. Functional Independence
    B. Stepwise Refinement
    C. Abstraction
    D. Refactoring
    E. Information Hiding

41) This form of UML deployment diagram shows the computing environment but does not explicitly indicate configuration details:
    A. Descriptor form.
    B. Instance form.
    C. Configuration form.
    D. Design form.
    E. Hardware form.

42) In the Process-Related View, a software component is a:
    A. A method or operation.
    B. A set of one or more classes.
    C. A pre-existing prepackaged design pattern.
    D. A class attribute or field.
    E. The package that contains the whole software project.

43) In this architectural style A data store resides at the center of the architecture, accessed frequently by other components that update, add, delete, or otherwise modify data in the store.
    A. Data-Centered
    B. Call-and-Return
    C. Layered
    D. Data-Flow
    E. Model-View-Controller

44) This architectural consideration implies that a system is consistent and balanced in its attributes.

A. Visibility
B. Spacing
C. Symmetry
D. Emergence
E. Economy

45) This type of diagram is BEST used to represent architectural context:
A. UML Context diagram.
B. Architectural Component Deployment Diagram (ACDD).
C. Architectural Activity Figure (AAF).
D. Entity-Relationship Diagram (ERD).
E. Architectural Context Diagram (ACD).

46) This basic design principle states that “depend on abstractions. Do not depend on concretions.”:
A. Open-Closed Principle (OCP)
B. Interface Segregation Principle (ISP)
C. Dependency Inversion Principle (DIP)
D. Liskov Substitution Principle (LSP)
E. Common Closure Principle (CCP)

47) This basic design principle states that “a module should be open for extension but closed for modification.”
A. Open-Closed Principle (OCP)
B. Interface Segregation Principle (ISP)
C. Dependency Inversion Principle (DIP)
D. Liskov Substitution Principle (LSP)
E. Common Closure Principle (CCP)

48) This type of coupling occurs when one component “surreptitiously” modifies data that is internal to another component:
A. Content
B. Control
C. External
D. Internal
E. Data

49) A common work product of UX design is:
    A. Color pallets
    B. Type setting
    C. Visual design
    D. Wireframes

50) This user experience design element is comprised of three components: information design, interface design, navigation design.
    A. Strategy
    B. Scope
    C. Structure
    D. Skeleton
    E. Surface

51) The video game marketplace Steam having an inconsistent user interface breaks this golden rule:
    A. Reduce the user's memory load.
    B. Make the interface consistent.
    C. Place the user in control.
    D. Make the design attractive.
    E. Provide for flexible interaction.

52) User personas are:
    A. Descriptions of real end users.
    B. Created for every user.
    C. Aid in software testing.
    D. Used to create scenarios for target users.

53) This task analysis and modeling action defines how a work process is completed when several people are involved.
    A. Task elaboration
    B. Object elaboration
    C. Workflow analysis
    D. Use case creation
    E. User profiling

54) In Google's 5-Day UX design sprint, on the sketch day:
    A. Lightning talks are given by domain experts.
    B. Individual team members (including stakeholders) are given the time and space needed to brainstorm solutions.
    C. A Minimally viable product based on the solution selected from the sketch phase is created.
    D. Each stakeholder presents his solution sketch and the team votes to determine the solutions that should be tackled in the prototyping phase.
    E. Developers watch users try out the prototype.

55) Number of actions, tasks, and system states indicated by the design model give an indication of:
    A. the size of the finished software in gigabytes
    B. the complexity of the interface and the degree to which it will be accepted by the user
    C. the memory load on users of the system
    D. the amount of learning required by users
    E. the interaction time and the overall efficiency of the system

56) This useability guideline states that "A well-designed interface provides the illusion that users are in the same place, with the work brought to them".
    A. Anticipation
    B. Controlled Autonomy
    C. Visible Navigation
    D. Learnability
    E. Focus

57) The windows calculator application implementing a user interface that is visually similar to a physical calculator is an example of this useability guideline:
    A. Consistency
    B. Human Interface Objects
    C. Learnability
    D. Metaphors
    E. Readability

58) Which of the following is NOT a category of design pattern?
    A. Component Patterns
    B. Mobile Patterns
    C. Object-Oriented Patterns
    D. Data patterns
    E. Application patterns

59) Which of the following subcategory of patterns BEST matches the following explanation: Address problems associated with the assignment of responsibility between objects and the manner in which communication is affected between objects.
    A. Structural patterns
    B. Behavioural patterns
    C. Interface patterns
    D. Creational patterns

60) Fill in the blank. A _____ encompasses a collection of patterns, each described using a standardized template and interrelated to show how these patterns collaborate to solve problems across an application domain.
    A. Pattern language
    B. Collaboration language
    C. Broad task
    D. Design task

61) This part of the pattern template describes the trade-offs that must be considered when the pattern is implemented:
    A. Context
    B. Forces
    C. Intent
    D. Collaborations
    E. Consequences

62) This is an example of an Anti-Pattern:
    A. Abstract factory
    B. Stovepipe System
    C. Container
    D. Chain of responsibility
    E. Adapter pattern

63) Which of the following answers matches the understanding of the value-based view of quality?
    A. Quality is something you immediately recognize but cannot explicitly define.
    B. Quality relates to the original specification of the product.
    C. Quality can be tied to inherent characteristics.
    D. Quality relates to the end user's specific goals.
    E. Quality is based on how much a customer is willing to pay for a product.

64) This ISO 25010 quality model eight characteristics that focus on both the static and dynamic nature of computer systems.
    A. Design quality model
    B. Item quality model
    C. Project quality model
    D. Product quality model

65) The independent video game developer Hello Games faced significant backlash regarding their game No Man's Sky due to:
    A. Following the "good enough" approach to software quality and releasing the game with missing features.
    B. Perfectionism that lead to the game being delayed for years.
    C. Missing the market window, customers were no longer interested in the game.
    D. Including a bug that permanently damaged customer's computers.

66) This quality cost comes from quality planning, formal technical reviews, test equipment, and training.
    A. Prevention Costs

B. Appraisal Costs
C. Internal Failure Costs
D. External Failure Costs
E. Support Costs

67) How effective have review techniques been in uncovering errors according to the software engineering industry?
A. Up to 100%
B. Up to 85%
C. Up to 50%
D. Up to 75%

68) The review metric Rework Effort (Er) refers to:
A. The effort (in person-hours) required to review a work product prior to the actual review meeting.
B. The effort (in person-hours) that is expended during the actual review.
C. Represents the sum of effort measures for reviews.
D. The effort (in person-hours) that is dedicated to the correction of those errors uncovered during the review.

69) The review metric Preparation Effort (Ep) refers to:
A. The effort (in person-hours) that is expended during the actual review.
B. The effort (in person-hours) required to review a work product prior to the actual review meeting.
C. Represents the sum of effort measures for reviews.
D. The effort (in person-hours) that is dedicated to the correction of those errors uncovered during the review.

70) A walkthrough is an example of this type of review:
A. Formal review.
B. Informal review.
C. Casual review.
D. Obsolete review.

71) Cyclomatic complexity V(G) for a flow graph G can be defined as:
    A. V(G) = E – N + 2
    B. G = E – N
    C. V(G) = E – N – 2
    D. V = E – 2 + N

72) How should you test unstructured loops?
    A. m passes through the loop where m < n.
    B. Pass through the loop at it's bounds m passes for m=0, 1, n-1, and n.
    C. Only one pass through the loop.
    D. Two passes through the loop.
    E. Unstructured loops are commonly a sign of a bigger problem, do not test, refactor instead.

73) This approach to testing uses implementation knowledge of control structures:
    A. White-box testing
    B. Black-box testing
    C. Functional testing
    D. Behavioural testing

74) Which of the following answers BEST describes the goals of a good test?
    A. A good test will be easy to run.
    B. A good test will have a high likelihood of finding errors.
    C. A good test will be simple to understand.
    D. A good test will be quick to get results from.

75) A regression test suite contains three (3) different classes of test cases. Which of the following is NOT part of the test suite?
    A. Additional tests that focus on software functions could be affected by change.
    B. Representative tests samples that exercise all software functions.
    C. Tests that look at how the software engineer is interacting with the software.
    D. Tests that focus on software components that have changed.