

Multiple-Choice Questions:

1. What often-false assumption does the waterfall model make about requirements specifications?
 - a. Specifications are predictable
 - b. Specifications are stable
 - c. Specifications have low change rates
 - d. All of the above
 - e. None of the above

2. True or false? It is better to discover defects later in the development process. That way, you can have more of the system finished before you worry about fixing things.
 - a. True
 - b. False

3. An empirical process model iterates between...
 - a. ... feedback and adaptation
 - b. ... design and implementation
 - c. ... requirements gathering and design
 - d. ... user studies and testing
 - e. None of the above

4. True or false? In iterative software development, it is recommended that iterations be 3 to 6 months in length.
 - a. True
 - b. False

5. If your project has unstable requirements (i.e., that are prone to change), you should use a waterfall process model.
 - a. True
 - b. False

6. In iterative development, how long should an iteration generally be?
 - a. 1 week
 - b. 2–6 weeks
 - c. 2–4 months
 - d. 6 months to a year
 - e. None of the above

7. Which of the following is meant by a *software development process*?
 - a. A running instance of a program; for example, a UNIX process is a software development process
 - b. Something developers do to accomplish a goal during a project; for example, planning poker is a software development process for estimation
 - c. Something developers use to accomplish a goal during a project; for example, Git or Subversion is a software development process for configuration management
 - d. An organization or structure imposed on the tasks and activities involved in developing a software product; for example, developing iteratively and incorporating best practices might be ingredients in a software development process
 - e. None of the above

8. Which one of the these is a bad length for an iteration?
 - a. 1 week
 - b. 2 weeks
 - c. 4 weeks
 - d. 6 weeks
 - e. All of the above

9. Which one of these is appropriate in an agile and iterative development process?
- Gather a complete set of requirements before designing/building anything.
 - Implement the backend of the system first—that is, before implementing the frontend functionality with which users interact.
 - Generate and maintain complete, detailed design documents, which comprehensively model all aspects of the design.
 - Implement the system incrementally, building it up bit by bit.
 - Test the code at the end, after the system has been completely implemented.
10. Which of the following is not an agile value?
- Individuals and interactions over processes and tools
 - Working software over comprehensive documentation
 - Customer collaboration over contract negotiation
 - Responding to change over following a plan
 - None of the above (i.e., all are agile values)
11. Which of the following problems does iterative development directly address?
- Design erosion
 - Unstable requirements
 - Program comprehension
 - All of the above
 - None of the above
12. Which type of process control model is appropriate for software development?
- A “defined” process control model
 - An “empirical” process control model
 - A “remote” process control model
 - A “parallel” process control model
 - None of the above

13. In the _____ development process, the various phases of development are completed sequentially, one after the other (e.g., gather all the requirements, then design the whole system, then implement the whole system, and so on).
- a. iterative
 - b. waterfall
 - c. agile
 - d. spiral
 - e. None of the above
14. True or false? In iterative software development, iterations should be 2 to 6 days in length.
- a. True
 - b. False
15. In software engineering, defects that are discovered _____ are _____ to fix.
- a. earlier; more expensive
 - b. later; more expensive
 - c. by customers; more difficult
 - d. by developers; more difficult
 - e. None of the above
16. Which of the following is meant by a software engineering process?
- a. Tools, such as Git, that developers use to accomplish their software engineering goals
 - b. An organization or structure imposed on the tasks and activities involved in developing a software product
 - c. A thread of control in a multithreaded computing system, such as the Rails web server
 - d. All of the above
 - e. None of the above

17. Which term is best defined by the following text?

Development of a system through repeated cycles and in smaller portions at a time, allowing software developers to take advantage of what was learned during development of earlier parts or versions of the system

- a. Configuration management
- b. Iterative development process
- c. Waterfall development process
- d. Verification and validation
- e. None of the above

18. Which term is best defined by the following text?

Development of a system whereby progress is seen as flowing steadily downwards through the phases of conception, analysis, design, construction, testing, production, and maintenance, and wherein one should move to a phase only when its preceding phase is reviewed and verified

- a. Configuration management
- b. Iterative development process
- c. Waterfall development process
- d. Verification and validation
- e. None of the above

19. Which of the following is an issue associated with the waterfall development process?

- a. Falsely assumes that requirements are stable and can be known from the start
- b. System defects are often discovered late in the development process
- c. Can lead to “analysis paralysis” wherein a considerable investment of time and effort is put into a project before any code is written
- d. All of the above
- e. None of the above

20. Following a _____ software engineering process tends to reveal defects early in development.

- a. Waterfall
- b. Iterative
- c. Sequential
- d. All of the above
- e. None of the above

Solutions:

1. d

2. b

3. a

4. b

5. b

6. b

7. d

8. a

9. d

10. e

11. b

12. b

13. b

14. b

15. b

16. b

17. b

18. c

19. d

20. b

Solution:

Waterfall software development makes the often-false assumption that requirements are mostly stable and can be known from the beginning.

This false assumption creates considerable problems for waterfall because the whole system may be developed before problems with the requirements are discovered. Furthermore, the later defects are discovered in a software product, the more expensive they are to fix (the Defect Cost Increase (DCI) Principle).

Iterative development overcomes these problems by maintaining a tight feedback loop. That is, feedback on the system is collected at regular intervals, revealing any problems early in the process when they are less expensive to correct.

Problem:

For each piece of text below, place an “I” and/or a “W” next to it if it corresponds to *Iterative* and/or *Waterfall* development process, respectively.

_____ A structure imposed on the development of a software product

_____ Development of a system through repeated cycles and in smaller portions at a time, allowing software developers to take advantage of what was learned during development of earlier parts or versions of the system

_____ Development of a system whereby progress is seen as flowing steadily downwards through the phases of conception, analysis, design, construction, testing, production, and maintenance, and wherein one should move to a phase only when its preceding phase is reviewed and verified

_____ System defects are often discovered late in the development process

_____ Good if your project has unstable requirements (i.e., that are prone to change)

_____ Falsely assumes that requirements can be known from the start

_____ Can lead to “analysis paralysis” wherein a considerable investment of time and effort is put into a project before any code is written

_____ Has an “empirical” process control model

Solution:

I,W A structure imposed on the development of a software product

I Development of a system through repeated cycles and in smaller portions at a time, allowing software developers to take advantage of what was learned during development of earlier parts or versions of the system

W Development of a system whereby progress is seen as flowing steadily downwards through the phases of conception, analysis, design, construction, testing, production, and maintenance, and wherein one should move to a phase only when its preceding phase is reviewed and verified

W System defects are often discovered late in the development process

I Good if your project has unstable requirements (i.e., that are prone to change)

W Falsely assumes that requirements can be known from the start

W Can lead to “analysis paralysis” wherein a considerable investment of time and effort is put into a project before any code is written

I Has an “empirical” process control model

Solution:

Key Features of an empirical process model is that it iterates between Feedback and adaptation.

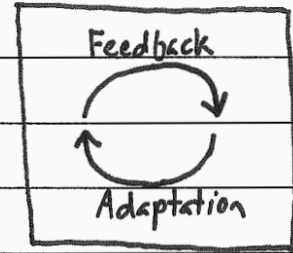
Yes, it effectively addresses unstable requirements.

It does so via the Feedback part of the

process: as requirements change, the changes are revealed

from the Feedback. Because they are discovered quickly,

they can be attended to early on when the cost of fixing them is lowest.



Problem:

What problem does iterative development directly address?

Solution:

Unstable / changing requirements

Multiple-Choice Questions:

1. Which of the following activities are not done by the developers?
 - a. US creation
 - b. US corrections
 - c. Set priorities of USs
 - d. Add Estimations
 - e. None of the above

2. In the agile development process taught in class, the development team estimates each user story and decides the priority for each story.
 - a. True
 - b. False

3. Which of the following techniques is used for estimating effort?
 - a. Role playing
 - b. Blueskying
 - c. Planning poker
 - d. Observation
 - e. None of the above

4. T or F? In general, the larger the estimate, the more likely it is to be accurate.
 - a. True
 - b. False

5. T or F? Planning poker uses the “wisdom of the single biggest expert” to estimate how long it will take to implement user stories.
 - a. True
 - b. False

6. Who knows the value of a requirement and who knows the cost of implementing the requirement? (The answer to this question motivates the need for certain developer-customer communications in the development process covered in class.)
 - a. The developers know both the value and the cost of requirements
 - b. The customer knows both the value and the cost of requirements
 - c. The customer knows the value of requirements, and the developers know the cost
 - d. The developers know the value of requirements, and the customers know the cost
 - e. Both the developers and the customer know the value and the cost of requirements

7. All else being equal, choose the estimate below that is most likely to be accurate.
 - a. 1 day
 - b. 1 week
 - c. 1 month
 - d. 1 year
 - e. 1 decade

8. T or F? To estimate work, developers commonly use their own past performance and/or the “wisdom of the crowd.”
 - a. True
 - b. False

9. T or F? Planning poker uses the “wisdom of the crowd” to estimate how long it will take to implement user stories.
- True
 - False
10. T or F? In general, the smaller the estimate, the more likely it is to be accurate.
- True
 - False
11. Which of the following approaches/techniques leverages the collective opinion of a group of individuals rather than that of a single expert? Circle all answers that apply.
- Black-box testing
 - Planning Poker
 - Writing user stories
 - Wisdom of the Crowd
 - None of the above
12. In the agile development process taught in class, the _____ estimate each user story, the _____ decide the priority for each story, and the _____ choose which user stories to implement in the next iteration.
- developers; customers; customers
 - customers; developers; customers
 - customers; customers; developers
 - customers; developers; developers
 - developers; customers; developers

Solutions:

1. c

2. b

3. c

4. b

5. b

6. c

7. a

8. a

9. a

10. a

11. b, d

12. e

Solution:

developer (or customer)	Creates	User stories
developer	estimates	User stories
customer	prioritizes	User stories
developer	selects	User stories
developer	Creates	tasks
developer	estimates	tasks
developer	assigns	tasks

Problem: All else being equal, which of the following USs most likely has the more accurate estimate?

Title: *Animated Buttons*

Description: Use jQuery to animate buttons.

Estimate: 2 days

Title: *Review Flight*

Description: A user will be able to leave a review for a shuttle flight they have been on.

Estimate: 20 days

Solution:

US Animate Buttons.

(Because estimates of less than 15 days are generally more accurate than over 15 days.)

Problem: What two things are wrong with the following series of steps?

1. First, the developers solicit user stories from the customer.
2. Next, the developers assign a priority level to each user story.
3. Next, the developers estimate the effort required to implement each user story.

Solution:

- (1) First, the developers solicit user stories from the customer.
- (2) Next, the developers assign a priority level to each user story.
- (3) Next, the developers estimate the effort required to implement each user story.

- ① Customers assign priorities
- ② Developers must estimate effort before customers assign priorities (otherwise how can the customer assess the cost/benefit?)

Problem: After your team chooses the USs to implement in an iteration, but before the team begins implementing, what three things must the team do?

Solution:

- ① Break the USs into tasks
- ② Estimate the time to complete each task
- ③ Assign each task to a developer