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Grade	**7.80** out of 10.00 (**78**%)

Question **1**

Correct

Mark 1.00 out of 1.00

What **activity** does a Software Process **not** include?

Select one:

- a. Design
- b. Evolution
- ◉ c. Fault tolerance ✓
- d. Specification
- e. Coding

Your answer is correct.

The correct answer is: Fault tolerance

Software architectural design is about

Select one:

- ○ a. An overall design about what diagrams are used and their relations ✗
- ○ b. A link between software design and the development location (building etc.) architecture
- ○ c. The main parts and their relations for investigating general characteristics of the system
- ○ d. Detailed class-level structure
- ○ e. The security properties of the system

Your answer is incorrect.

The correct answer is:
The main parts and their relations for investigating general characteristics of the system

The multiplicity relation from user requirements to system requirements is

Select one:

- ○ a. All user requirements are related to all system requirements ✗
- ○ b. 1 to 1
- ○ c. Many to 1
- ○ d. 1 to many
- ○ e. There is no relation between user and system requirements

Your answer is incorrect.

The correct answer is: 1 to many

Why are design and programming interleaved activities?

Select one:

○ a. To comply with plan-driven process models

◉ b.
So that code and design have chance to be corrected and conform to each other
✔

○ c. To leave time for testing in between

○ d.
Design cannot be completed before seeing how parts are coded

○ e.
There is always shortage of programmers: they have to be split between tasks

Your answer is correct.

The correct answer is:
So that code and design have chance to be corrected and conform to each other

Prototyping is mostly about

Select one:

◉ a. Improving quality ✗

○ b. Easier integration

○ c. Understanding

○ d. Easier testing

○ e. Finishing fast

Your answer is incorrect.

The correct answer is: Understanding

What is **true** about requirements in **agile** development?

Select one:

- ○ a.
  All user stories should be completed before starting development
- ◉ b. Detailed specification is not necessary ✓
- ○ c.
  If complete requirements are available, agile will not work
- ○ d. Requirements are not necessary
- ○ e. Changing requirements are not allowed

Your answer is correct.

The correct answer is: Detailed specification is not necessary

What can be said about the relation between functional and non-functional requirements?

Select one:

- ○ a.
  Functional requirements are more important, others can be determined later
- ○ b. They are independent from each other
- ◉ c.
  One non-functional requirement may generate many functional requirements
  ✓
- ○ d.
  Every non-functional requirement corresponds to exactly one functional requirement
- ○ e.
  Every functional requirement comes with some non-functional requirements

Your answer is correct.

The correct answer is:
One non-functional requirement may generate many functional requirements

The most important **goal** of agile software development is

Select one:

- a. Delivering less documentation
- ⦿ b. Using incremental development ✗
- c. Coping with changing requirements
- d. Conforming to development standards
- e. Satisfying programmers

Your answer is incorrect.

The correct answer is: Coping with changing requirements

Which one of the following UML diagrams is for **dynamic** modeling?

Select one:

- a. Component diagrams
- ⦿ b. Class diagrams ✗
- c. Object diagrams
- d. Sequence diagrams
- e. Use case diagrams

Your answer is incorrect.

The correct answer is: Sequence diagrams

What is the difference between refactoring and reengineering?

Select one:

○ a.
Refactoring is conducted before any problems are found, reengineering is done after the degradation of software

✓

○ b.
Refactoring is for only functional requirements, reengineering is for non-functional requirements also.

○ c.
Refactoring is for agile projects, reengineering is for plan-based development

○ d.
Refactoring is for our project, reengineering is to understand someone else's project

○ e.
Refactoring finds development errors, reengineering finds validation problems

Your answer is correct.

The correct answer is:
Refactoring is conducted before any problems are found, reengineering is done after the degradation of software

Suppose you have an online banking system that performs a backup of all customer records once a week **for 4 hours**, during which it is not able to serve any customers. Additionally, you have observed that the system is a hot target for denial of service (DoS) attackers, who launch a high-volume attack on the system **outside** its maintenance window **once a month**, which lasts roughly **8 hours**. Other than these times, the system is always available to serve its clients. What is the approximate (monthly) availability of this online banking system? (You can assume we have 28 days in a month)

Select one:

   ○ a. 54/56 (~96%) ✓

   ○ b. 2/56 (~4%)

   ○ c. 50/56 (~89%)

   ○ d. 1/56 (~2%)

   ○ e. 55/56 (~98%)

Your answer is correct.

The correct answer is: 54/56 (~96%)

Which of the following is **not** one of the reasons why the replacement of a legacy system is risky?

Select one:

   ○ a.
The development of the new system might involve more recent technologies
✓

   ○ b.
The business processes of the system might be tightly coupled with the system

   ○ c.
There might be undocumented business rules embedded in the legacy system

   ○ d.
The development of new software might exceed the available budget

   ○ e. The system might lack complete specification

Your answer is correct.

The correct answer is:
The development of the new system might involve more recent technologies

Which of the following is **not** an indication that the maintainability of a system is **decreasing**?

Select one:

- a.
  The average time required to analyze the impact of changes has increased from 2 weeks to a month over the last year

- b.
  The number of outstanding change requests in the previous month was 10, whereas it is 2 this month

- ◉ c.
  The number of corrective maintenance requests in the system has doubled in the past two months
  ✗

- d.
  The hardware failures in the system have increased by 25% in the past three months

- e.
  The average time taken to implement a change request was 20 days over the last 6 months, compared to an average of 10 days in the prior two years

Your answer is incorrect.

The correct answer is:
The number of outstanding change requests in the previous month was 10, whereas it is 2 this month

Which of the following is **not** a part of development testing of a software product?

Select one:

- a. Component testing

- b. Unit testing

- c. System testing

- d. Interface testing

- ◉ e. Beta testing ✓

Your answer is correct.

The correct answer is: Beta testing

Question 15

Incorrect

Mark 0.00 out of 1.00

Suppose you are building a small security-critical system **incrementally** with a team of 5 people, where you would like to ensure that the addition of new features to the system will **not** introduce new security vulnerabilities, while providing protection against all previously identified security issues. Which of the following approaches would you utilize to build this system?

Select one:

○ a. Distributed Scrum ✗

○ b. Plan-driven development

○ c. Reuse-oriented software engineering

○ d. Waterfall development

○ e. Test-driven development

Your answer is incorrect.

The correct answer is: Test-driven development

Question 16

Correct

Mark 1.00 out of 1.00

Consider a home health monitoring system for elderly patients. Which of the following are **misuse** cases for such a system?
I. Check patient health status and update medication list
II. Measure blood sugar level and compare with previous readings
III. Intercept the transfer of patient health data to the hospital over the wireless network
IV. Send bogus prescription to patient via the mobile device

Select one:

○ a. III and IV ✓

○ b. I and IV

○ c. I, II and IV

○ d. II and III

○ e. III only

Your answer is correct.

The correct answer is: III and IV

Which of the following are **non-functional** requirements for an online student information system?

I. A student should be able to search for courses taught in that semester

II. In case of failure, the system should be able to restart within an hour

III. An instructor should be able to check the transcript of all students he/she is advising

IV. The system should be able to handle at least 100 student logins per second

Select one:

- a. I and III
- b. I and II
- c. II and IV ✓
- d. III and IV
- e. I and IV

Your answer is correct.

The correct answer is: II and IV

Consider the following partial list of requirements for a student information system. Which **requirements property** is guaranteed **not** to be satisfied based on this list?

I. System admins should be able to view the complete personal information of all students.u

II. The system should provide an interface through which students can request help for using the system.

III. A student's personal information such as home address should only be visible to the student himself/herself.

Select one:

- a. Validity
- b. Verifiability
- c. Consistency ✓
- d. Realism
- e. All of the listed properties are guaranteed to be satisfied

Your answer is correct.

The correct answer is: Consistency

Given the following systems, which is the best architecture design pattern for each system?

I. An e-commerce website, which updates in real time the product availability information and shopping cart views based on user interactions with the system and new product additions to the catalogue

II. A virus scanner that accepts a file as input, extracts specific features from the file, formats the feature values, searches among those features for specific attack signatures and outputs the scanning result

III. A currency exchange information system, where people all over the world can issue an HTTP request to the website to retrieve the currency exchange rate between two currencies (e.g. USD vs TL)

Select one:

○ a.

I. Layered, II: Model-view-controller, III: Layered

○ b.

I. Model-view-controller, II: Layered, III: Model-view-controller

◉ c.

I. Model-view-controller, II: Pipe&filter, III: Client-server

✔

○ d.

I. Pipe&filter, II: Layered, III: Repository

○ e.

I. Pipe&filter, II: Client-server, III: Layered

Your answer is correct.

The correct answer is:

I. Model-view-controller, II: Pipe&filter, III: Client-server

Suppose it is found that there is open source software that implements some of the required functionality in your new product. You need to give serious consideration for the following matters, except for (the) _____.

Select one:

○ a. Architecture design of your product

○ b. Dependencies of the software

○ c. Support for the software

○ d. License of the software

◉ e. Price of the software ✓

Your answer is correct.

The correct answer is: Price of the software

"Spectre and Meltdown are design flaws in modern CPUs, which could allow hackers to get around system protections on a wide range of PCs, servers, and smartphones, allowing attackers to access data including passwords, from memory."

Fill in the blanks using proper terminology.

Spectre and Meltdown are _____ which can be _____ .

Select one:

○ a.

Trojan horses – ridden

○ b.

Attacks – stopped

○ c.

Assets – protected

◉ d.

Vulnerabilities – exploited ✓

○ e.

Threats – neutralized

Your answer is correct.

The correct answer is:

Vulnerabilities – exploited

One morning last year, Fred Schaub drove his car, which is turned on and off with the push of a button instead of a key, into the garage attached to his home and went into his house believing the car was shut off. Twenty-nine hours later, he was found dead, overcome with carbon monoxide that flooded his home while he slept. He is among more than two dozen people killed by carbon monoxide nationwide since 2006 after a keyless-ignition vehicle was inadvertently left running in a garage."

The quoted piece underlines the **conflict** between the two factors:

Select one:

○ a.

   Convenience – security

○ b.

   Comfort – reliability

○ c.

   Flexibility – operability

○ d.

   Understandability – performance

◉ e.

   Usability – safety ✓

Your answer is correct.

The correct answer is:

   Usability – safety

Many companies do not use software engineering methods in their everyday work. As a result:

Select one:

○ a.

They follow agile processes

○ b.

Overall software cost in the industry is reduced

◉ c.

Their software is often more expensive and less reliable

✓

○ d.

Their code is more understandable

○ e.

These companies are more efficient and successful

Your answer is correct.

The correct answer is:

Their software is often more expensive and less reliable

Find the **wrong** statement about incremental development:

Select one:

○ a.

It can be agile

◉ b.

Specification, development, and validation are always isolated project phases

✓

○ c.

It can be plan based

○ d.

It is not used in waterfall methodology

○ e.

It allows easier integration of customer feedback

Your answer is correct.

The correct answer is:

Specification, development, and validation are always isolated project phases

Find the item that is **not** a reason for software evolution

Select one:

- ○ a. The software is reliable ✓

- ○ b.
  There are errors in the code

- ○ c.
  Adapting to changing environment

- ○ d.
  To increase capabilities with added functions

- ○ e. Adapting to new technology

Your answer is correct.

The correct answer is: The software is reliable

What type of testing is specific to the **security** area?

Select one:

- ○ a. Unit
- ○ b. Integration
- ○ c. Verification
- ○ d. System
- ○ e. Penetration ✓

Your answer is correct.

The correct answer is: Penetration

The relation among dependability, reliability, and availability is (that) _____?

Select one:

○ a. They are all disjoint, however all intersect security

○ b. They are all disjoint, however all are covered by quality

◉ c. Dependability covers the others ✓

○ d. Reliability covers the others

○ e. Availability covers reliability

Your answer is correct.

The correct answer is: Dependability covers the others

Frequent usage of switch (case) statements is not recommended. Instead, _____?

Select one:

○   a.   Nested if statements can be used

○   b.

     Input data should be pre-processed to reduce variety in its values

○   c.   Parallel algorithms can evaluate all the alternatives at once

○   d.

     Go to statements can direct the execution to various code blocks

◉   e.

     Polymorphism should be used, which would avoid type checking

     ✓

Your answer is correct.

The correct answer is:

Polymorphism should be used, which would avoid type checking

What can you model with an activity diagram that you **cannot** model with a class diagram?

Select one:

- ⦿ a. The execution orders of activities or methods ✓
- ○ b. The complete set of activities or methods
- ○ c. Starting time of the execution of activities or methods
- ○ d. What entity (other class / activity etc.) calls a method
- ○ e. Priority of activities or methods

Your answer is correct.

The correct answer is: The execution orders of activities or methods

Find the correct choice for a class diagram for modelling fruits, where an *apple* is a specific kind of fruit. An apple has seeds in it. An apple class directly or indirectly includes the properties of the 'fruit' class and the 'seed' class.

Select one:

- ○ a. Apple inherits form both fruit and seed
- ○ b. Apple inherits from only seed
- ⦿ c. Apple only inherits from fruit ✓
- ○ d. Both fruit and apple inherit from seed
- ○ e. Both seed and apple inherit from fruit

Your answer is correct.

The correct answer is: Apple only inherits from fruit

What kind of security requirement is the statement "The contents of messages transmitted between two users of the application shall not be readable by anyone else"?

Select one:

- a. Immunity

- b. Integrity

- c. Non-repudiation

- d. Confidentiality ✓

- e. Availability

Your answer is correct.

The correct answer is: Confidentiality

Which software engineering concept are the following statements related to?

I. Programs executing on the software platform are generated automatically from models.

II. Systems are considered at a higher level of abstraction.

III. A subset of UML models are used to describe a system.

Select one:

○ a. Model-driven engineering ✓

○ b. Reuse-oriented software engineering

○ c. Scrum

○ d. Reverse engineering

○ e. Test-driven development

Your answer is correct.

The correct answer is: Model-driven engineering

Which of the following is an example of N-version programming?

Select one:

○ a.

The primary control system in an aircraft uses a different processor from the secondary systems.

○ b.

The primary control system in an aircraft is programmed using a different language from the secondary systems.

◉ c.

Five body sensors deliver their readings to a remote healthcare system, where the majority measure is accepted as correct and processed.

✗

○ d.

The attack detection module of a network security tool is implemented by three different teams and the tool decides how to handle the network packets (i.e. whether to prevent or allow them into the network) based on a combination of the responses from the three implementations.

○ e.

The development of a software component is completed by two people programming together.

Your answer is incorrect.

The correct answer is:

The attack detection module of a network security tool is implemented by three different teams and the tool decides how to handle the network packets (i.e. whether to prevent or allow them into the network) based on a combination of the responses from the three implementations.

You are tasked with unit testing a method for calculating the area of a geometric shape of a given type, with given dimensions, which has the following method signature:

void area(String type, int width, int length)

For the method to work properly, the *type* and *width* parameters should always be provided. The *length* parameter will be ignored when drawing a square. Suppose you are allowed to run only 3 unit tests for this method. Which three of the following test cases would you run to attain the **highest** testing coverage? (Hint: Consider equivalence classes for inputs)

I. area("square", 2, 0)
II. area("square", 4, 0)
III. area(null, 2, 2)
IV. area("square", -1, 0)
V. area("square", 4, 2)

Select one:

- a. I, III, IV ✓
- b. II, IV, V
- c. I, II, V
- d. I, II, IV
- e. I, II, III

Your answer is correct.

The correct answer is: I, III, IV

Which of the following is a correct ordering of different software testing processes for a
software project taking the **plan-driven** approach for development?

Select one:

○ a.

   Acceptance testing -> system testing -> unit testing

○ b.

   Alpha testing -> stress testing -> component testing

○ c.

   System testing -> beta testing -> use case testing

○ d.

   Component testing -> beta testing -> system testing

◉ e.

   Unit testing -> performance testing -> beta testing

   ✔

Your answer is correct.

The correct answer is:

   Unit testing -> performance testing -> beta testing

Which of the following projects should use the waterfall software process model?

Select one:

○ a.
A platform for teaching programming to children under the age of 9, which will reuse some components from an existing IDE.

○ b.
A custom travel booking management software for a company to be developed with feedback from the company's current employees.

○ c.
A smartphone application for sharing 1-minute long videos with your friends.

◉ d.
The control software for a nuclear power plant.
✔

○ e.
A new social media challenge application that aims to attract more users than TikTok within 2 months and include more advanced functionality within 6 months.

Your answer is correct.

The correct answer is:
The control software for a nuclear power plant.

Which of the following is **not** a benefit of agile software development?

Select one:

- a.
  Customers can provide feedback on the development work done.

- b.
  Rapid deployment of useful software is possible.

- ⊙ c.
  Customers' change requests can be accommodated easily.
  ✗

- d.
  System structure gets better as new increments are added.

- e.
  The amount of documentation that needs to be done is not too much.

Your answer is incorrect.

The correct answer is:
System structure gets better as new increments are added.

Question 38

Correct

Mark 1.00 out of 1.00

What kind of requirement is **missing** from the following list of requirements for a weather station system?

I. The temperature sensors deployed shall not harm the wildlife.
II. The system software shall be developed in Python.
III. The temperature sensors shall keep functioning without interruption for at least 12 months on a fresh battery.
IV. The system shall not disclose data to unauthorized services.

Select one:

- ○ a. Safety requirement
- ○ b. Organizational requirement
- ◉ c. Usability requirement ✔
- ○ d. Security requirement
- ○ e. Dependability requirement

Your answer is correct.

The correct answer is: Usability requirement

Question 39

Correct

Mark 1.00 out of 1.00

Which of the following are **disadvantages** of the repository architectural pattern?
I. Data inconsistency
II. Data communication interoperability between components
III. The single point of failure problem

Select one:

- ○ a. I only
- ○ b. I and III
- ○ c. II only
- ◉ d. III only ✔
- ○ e. I and II

Your answer is correct.

The correct answer is: III only

Which of the following is **correct** for the waterfall software development model?

Select one:

○ a.
This model is mostly used for small projects with constantly changing requirements.

◉ b.
The major drawback of this model is the difficulty of accommodating change after the process is underway.
✓

○ c.
The stages of the development are not distinct.

○ d.
Rapid development and response to customer requests has precedence over extensive documentation.

○ e.
Scrum and XP are examples of this model.

Your answer is correct.

The correct answer is:
The major drawback of this model is the difficulty of accommodating change after the process is underway.

Correct

Mark 1.00 out of 1.00

Which of the following changes would you implement when refactoring the code of a big system?

I. Merge short methods into one long method.

II. If the same code segment is repeated in multiple places within a program, implement that as a single method that can be invoked from different parts of the program as needed.

III. Encapsulate data items that occur together frequently into an object containing all of those data items.

IV. Replace uses of polymorphism in object-oriented programs with switch-case statements.

Select one:
- ○ a. I and IV
- ○ b. IV only
- ○ c. I only
- ● d. II and III ✓
- ○ e. I and II

Your answer is correct.

The correct answer is: II and III

Question 42

Incorrect

Mark 0.00 out of 1.00

Checking all possible inputs for validity would enhance the ... (which property?) of the software module.

Select one:
- ○ a. Robustness
- ● b. Validity ✗
- ○ c. Availability
- ○ d. Strength
- ○ e. Testability

Your answer is incorrect.

The correct answer is: Robustness

Inspections are **preferred** in some cases against testing, because

Select one:

- a. They are less costly
- b. It is easier to document the results
- c. They are done using pair programming
- d. Non-programmers can conduct inspections
- ● e. They can find the errors that are masked by other errors ✓

Your answer is correct.

The correct answer is: They can find the errors that are masked by other errors

Which software development method are the following practices associated with?

I. An automated unit test framework is used to write tests for a new piece of functionality before that functionality itself is implemented.

II. Code is improved continuously for maintainability.

III. All developers take responsibility for all code.

Select one:

- a. Scrum
- ● b. Extreme programming ✓
- c. Waterfall
- d. Plan-driven development
- e. Reuse-oriented software engineering

Your answer is correct.

The correct answer is: Extreme programming

Which of the following is **not** an example of redundancy in a system?

Select one:

○ a.
Creating a spam filter that uses the results from three machine learning algorithms instead of one for detecting spam emails.

○ b.
Installing three identical hardware components as the pressure sensor units of a forecasting system

○ c.
Maintaining the health records database of a hospital in two servers housed in different buildings

◉ d.
Connecting the database server of an e-commerce system to a uninterruptible power supply (UPS) for continued operation in case of power outage
✔

○ e.
Keeping a backup of the grades database in a student information system on Amazon Web Services cloud

Your answer is correct.

The correct answer is:
Connecting the database server of an e-commerce system to a uninterruptible power supply (UPS) for continued operation in case of power outage

In a software system, given that there are some existing **faults** in **all** of the components listed in the answer choices below, and a limited budget to hire people to fix them, eliminating 25% of the faults in which of these components will provide the highest increase in system reliability? (component usage frequencies by system users are given and component types are listed in parentheses)?

Select one:

○ a.
Component 2 - usage frequency: 10% (performance boosting component)

○ b.
Component 1 - usage frequency: 50% (mostly functionality-related component)

○ c.
Component 3 - usage frequency: 30% (mostly functionality-related component)

◉ d.
Component 5 - usage frequency: 0.9% (safety-critical component)
✗

○ e.
Component 4 - usage frequency: 9.1% (component providing redundancy)

Your answer is incorrect.

The correct answer is:
Component 1 - usage frequency: 50% (mostly functionality-related component)

When designing a software system, one should

Select one:

- a.
  If reusable parts are used, documentation should be developed for them making the development more expensive

- b.
  Reuse should only be employed if internals of the reusable software are known very well by the team

- c.
  Reusable parts should only be used if they are free software

- d.
  Reusable parts should be avoided because they are not developed suitable for the current project

- ⦿ e.
  Use existing (reusable) software parts as much as possible
  ✔

Your answer is correct.

The correct answer is:
Use existing (reusable) software parts as much as possible

Question 48

Correct

Mark 1.00 out of 1.00

Which of the following **cannot** be protected by copyright?

Select one:

○ a.
The performance of the musical "Phantom of the Opera" at the Royal Opera House

○ b.
A statistical software package

○ c.
The latest book in the Harry Potter series

○ d.
The latest episode of the "Star Wars" movie

◉ e.
Einstein's formula on mass-energy equivalence
✓

Your answer is correct.

The correct answer is:
Einstein's formula on mass-energy equivalence

Question 49

Correct

Mark 1.00 out of 1.00

Which of the following is **not** a system architecture view?

Select one:

○ a. Process view

○ b. Development view

◉ c. Reliability view   ✓

○ d. Physical view

○ e. Logical view

Your answer is correct.

The correct answer is: Reliability view

Which of the following is **not** true for the layered architecture pattern?

Select one:

○ a.
It allows replacement of an entire layer as long as the interface is maintained

○ b.
Clear separation between the layers is often difficult

○ c.
Redundancy can be used at each layer for enhanced dependability

○ d.
Each layer provides services to the layer above it

◉ e.
Its performance is always higher than other architecture patterns
✔

Your answer is correct.

The correct answer is:
 Its performance is always higher than other architecture patterns