Software Design Exam 2021

Q1

Which of the following statements is TRUE?

- **An abstract class can have relationships with other classes.**

- An abstract class has no relationships with other classes.

- An abstract class can be instantiated.

- An abstract class has no attributes.

Q2

Which of the following statements about naming variables in your code is TRUE?

- When using a temporary variable, a good practice is to always name it "temp".

- **Variable names should convey as much information as possible.**

- Variable names should be as long as possible.

- Variable names should be as short as possible.

Q3

Given the following fragment of class diagram, which of the following statements is TRUE?
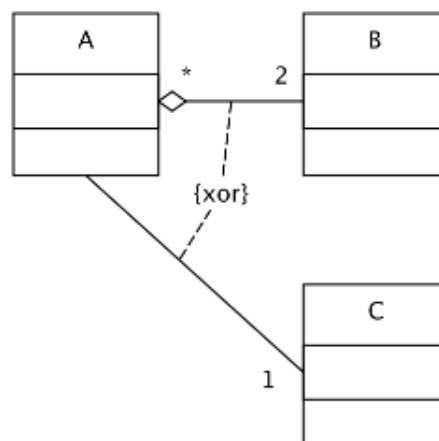
- **One object of B may be associated with multiple objects of A.**

- One object of A may contain only two or more objects of B.

- If an instance of A is deleted, all contained instances of B are deleted as well.

- One object of A is associated with exactly one object of C and two objects of B.

Q4

Which of the following statements about state machine diagrams are FALSE?

- A state machine can have zero or more final states.

- Events trigger transitions.

- **The initial state can have any number of incoming transitions.**

- A guard condition is only evaluated when the corresponding event occurs.

Q5

Which of the following statements about the loop fragment of UML sequence diagrams is TRUE?

- The loop fragment has more than one operand.

- **If you model a loop loop(8) with the condition [x ¡ 10], the loop is executed exactly 8 times, independently of the condition.**

- If the minimum and maximum number of iterations are not specified, the default value is (1, *) where * denotes an infinite number of iterations.

- Both the minimum and maximum number of iterations must be always defined.

Q6

Given the following state machine diagram, what is the value of x after the occurrence of the event chain e2, e4, e4, e1, e3, e2?
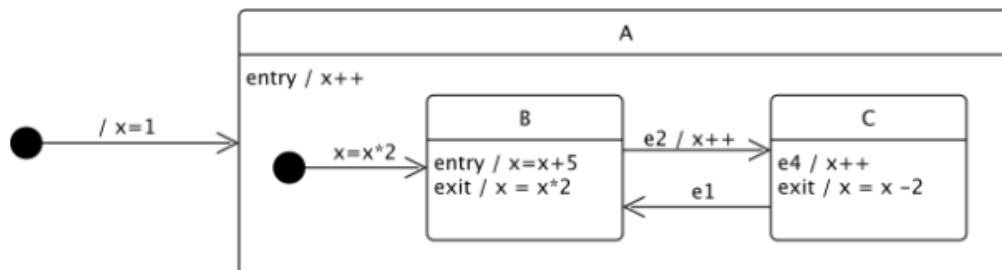
- 21

- **49**

- 65

- 48

Q7

Which of the following statements about complexity is TRUE?

- It is more important for a module to have a simple implementation than a simple interface.

- **It is more important for a module to have a simple interface than a simple implementation.**

- It is a good practice to have the same piece of code appearing in many parts of your system.

- One method should perform as many tasks as possible.

Q8

Which of the following statements about the UML generalization relationship is TRUE?

- A generalization relationship does not represent the fact that instances of a class are special types of instances of another class.

- A generalization relationship may have navigable, non-navigable, and partially navigable directions.

- **A generalization relationship does not have multiplicities and visibility.**

- A generalization relationship may be identified by a unique association name.

Q9

Given the following sequence diagram, which of the four traces below is possible?
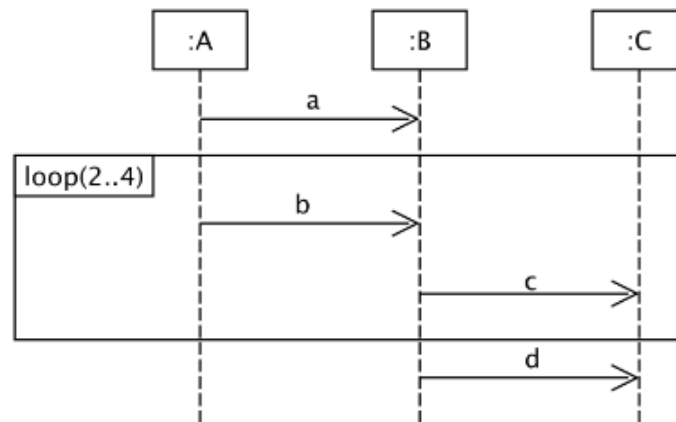
- a→b→c

- a→b→c→b→c→b→c→b→c

- a→b→c→b→c→b→d

- **a→b→c→b→c→b→c→d**

Q10

Which of the following statements about compositions (composite aggregations, represented as black diamonds in diagrams) is FALSE?

- **The composite aggregation can be used in object diagrams.**

- In a composition, a part may belong to one and only one composite at a time.

- The composite aggregation is not a commutative relationship.

- When the composite element is deleted, the parts are deleted too.

Q11

Can you give a brief definition of UML sequence diagrams and which aspects of the system they can represent?

Q12

What are the main principles of the Observer design pattern?