CISP457 Midterm 2

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Instructions: You may bring any material that is handwritten or printed *prior* to the examination to help you. You can also bring a calculator if you think it may help you. However, you can only use the calculator for numerical computations only.

You, as an individual, are expected to do your own work. This means you cannot seek, receive or otherwise acquire any assistance except clarifications from the professor during an examination. Any communication involving the contents of the subject matter or the examination is considered cheating. Do not initiate or accept such communication, or the result of your examination is automatically voided.

Each correct answer is worth one point, each wrong answer is worth -0.25 point, and each unanswered question is worth zero point.

Make sure you write down you name on the upper right corner *first*, otherwise I cannot give points to anonymous students!

The baseline is 12, there are 15 questions.

1 In this flowchart, what *must* be true when we arrive at the "end" terminator?
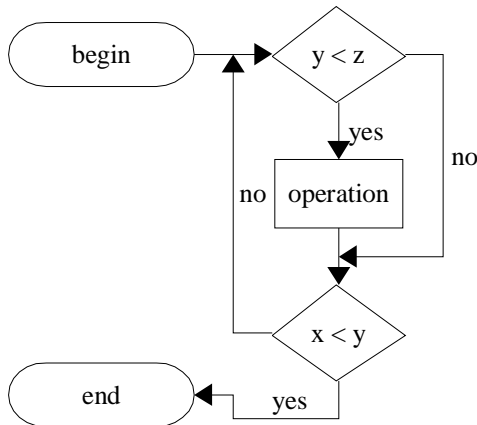
A $x < y$

B $x \geq y$

C $y < z$

D $y \geq z$

E $x < y$ and $y < z$

2 Observe the pseudocode.

    if $x < y$ **then**
      $s \leftarrow 1$
    else if $x \neq 10$ **then**
      $s \leftarrow 2$
    else
      if $x > 2 \times y$ **then**
        $s \leftarrow 3$
      else
        $s \leftarrow 4$
      end if
    end if

If x has a value of 24, and y has a value of 20 before this code, what will be the value of s at the end of this pseudocode?

A 1

B 2

C 3

D 4

E The value of s cannot be determined

3 Observe the following decision table:

$x < y$	$y < z$	op1	op2	op3
T	T	X	X	
T	F	X		X
F	T	X	X	X
F	F	X	X	X

As per our usual notation, "T" means true, "F" means false, "X" means the action is taken.

Assuming a system is implemented as specified, and all of "op1", "op2" and "op3" are performed, what do we know about x, y and z?

A only that $x < y$

B only that $y < z$

C only that $x \geq y$

D only that $y \geq z$

E $x < y$ and $y < z$

4 Choose one representation of logic that cannot represent looping (aka iterations).

    A Pseudocode

    B Activity Diagram

    C State Diagram

    D Flowchart

    E Decision Tree

5 Assume that we are in state S2. How many times has trigger "t1" possibly occurred? Choose the most inclusive answer that is correct.
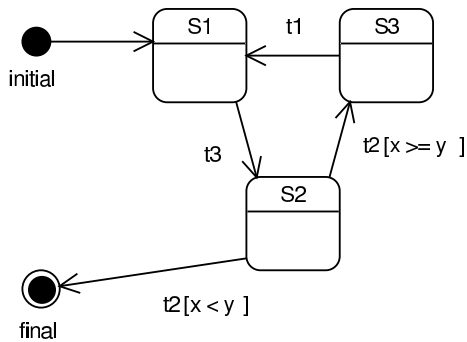

    A 0 times (never)

    B 1 time

    C at least 1 time

    D at least 2 times

    E any number of times, including 0

6 To what type of construct specifies an "Entry Action"?

    A state in a state diagram

    B step (state) in an activity diagram

    C transition in a state diagram or activity diagram

    D relationship in a class diagram

    E generalization in a class diagram

7 Analyze this class diagram. Given that I have 30 objects of "Class_2", and 23 objects of "Class_4", what is the maximum number of objects of "class_3"?

(Recall that if no multiplicity is specified, the default is 1.)
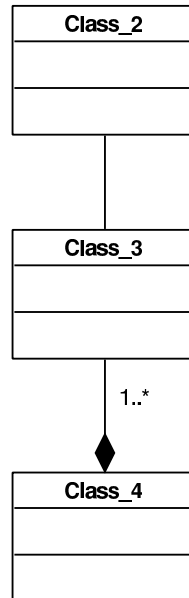
    A 30

    B 23

    C 53

    D it is not possible to have 30 objects of "class_2"

    E it is not possible to have 23 objects of "class_4"

8 Given n *independent* conditions, there are 2^n possible combinations in a decision table. What if we are given the conditions as follows: $x = y + 1$ and $x < z$? How many possible combinations (of the two conditions) are there?

    A 0

    B 1

    C 2

    D 3

    E 4

9 Read the class diagram. If an object of "Class_7" is deleted, objects of what other classes *must* be deleted as well?
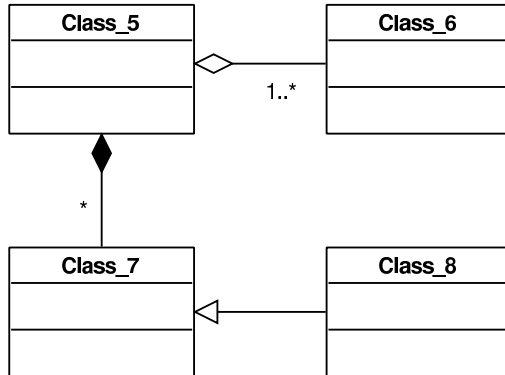
A only Class_8

B only Class_5 and Class_8

C only Class_5 and Class_6

D Class_5, Class_6 and Class_8

E The deletion may not trigger the deletion of objects of other classes.

10 Which diagram type allows "attribute" as a construct in one of its elements?

A Activity diagram

B Class diagram

C Sequence diagram

D State diagram

E Use case diagram

11 Which diagram type is suitable when we need to document how a a class of objects relate to another class of objects?

A Activity diagram

B Class diagram

C Sequence diagram

D State diagram

E Use case diagram

12 What is wrong with the following activity diagram?
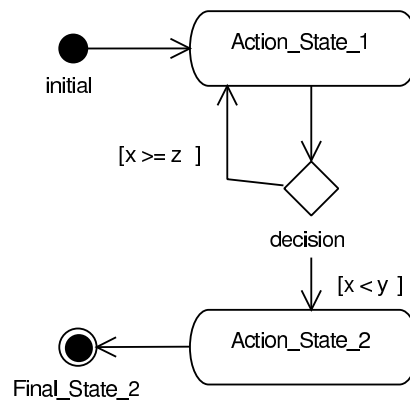
A there is no problem with it

B triggers are mandatory

C Action_State_1 has two incoming transitions

D Decision state "decision" is not allowed in an activity diagram

E The guard conditions of outgoing transitions of "decision" do not cover all possible cases.

13 Which form of logic representation resembles actual program code (especially in any structured programming language) the most?

A activity diagram

B flowchart

C decision table

D decision tree

E pseudocode

14 In a correctly constructed activity diagram, which type of states can only have incoming transitions?

A action states (known as steps in my notes)

B initial states

C final states

D decision states

E all states may have incoming or outgoing transitions

15 Each "method" of a class is similar to a function or a subroutine in a high level programming language. In the UML, if one is to document the logic of a method, what diagram is suitable for this purpose?

A Use Case Diagram

B Sequence Diagram

C Activity Diagram

D Class Diagram

E State Diagram

3