CSPB 3155 - Reckwerdt - Principles of Programming Languages

Started on	Saturday, 27 July 2024, 9:50 PM
State	Finished
Completed on	Saturday, 27 July 2024, 9:51 PM
Time taken	1 min 54 secs
Marks	17.00/17.00
Grade	**10.00** out of 10.00 (**100**%)

Question **1**

Correct

Mark 2.00 out of 2.00

Consider the following classes in scala:

```
abstract class A (val n: Int)

class B (val n: Int) extends A

class C (val n: Int) extends A

class D (val n: Int) extends B

def foo (a: A) = { // code omitted }
```

Which of the expressions can be passed as an argument for a call to foo without resulting in an error?   new D(10) ✔

new A(15)   "foo"   "hello"   25

Correct

Marks for this submission: 2.00/2.00.

Question **2**

Correct

Mark 4.00 out of 4.00

Consider the abstract class T and classes A and B as defined below.

```
abstract class T {
    val n : Int
    def foo(n: Int): Unit
}

class A extends T { ... // contents omitted }

class B extends A { ... // contents omitted }
```

Select all facts from the list below that must be necessarily true about the members of class A and B.

Select one or more:

☑ a. Class A must implement members n: Int and foo: Int => Unit. ✔

☑ b. Class B may implement members n: Int and foo: Int => Unit that override the definitions inherited from A ✔

☐ c. class B must override the members n and foo defined in A.

☑ d. class B is considered to be a subclass of T ✔

☐ e. class A can change the type of the members n and foo while overriding them from T.

☐ f. If class B overrides member foo then class A does not need to do so.

Correct

Marks for this submission: 4.00/4.00.

Question **3**

Correct

Mark 3.00 out of 3.00

Consider the following scala code snippet:

```
abstract class A
class B extends A
class C extends A
class D extends B

def foo[T <: B]( t: T): Unit = { ... //code omitted }
```

Select all the expressions that can be passed as argument to the function foo without raising a compile time error.

Select one or more:

☐ a. None of the provided choices are correct

☐ b. new C()

☑ c. new D()   ✔

☐ d. new A()

☑ e. new B()   ✔

Correct

Marks for this submission: 3.00/3.00.

Question **4**

Correct

Mark 4.00 out of 4.00

Consider the scala code snippet below:

```
trait A
abstract class B
class C extends B
class D extends C with A
class E extends D
class F extends B with A

class MyContainer[T <: B with A] {
 .. code omitted
}
```

Select which of the classes defined above can be used as a type parameter T for MyContainer to obtain a MyContainer[T] object?

Select one or more:

☐ a. MyContainer

☑ b. F ✔

☑ c. E ✔

☐ d. B

☐ e. C

☑ f. D ✔

> Correct
>
> Marks for this submission: 4.00/4.00.

Question **5**

Correct

Mark 4.00 out of 4.00

[4 points] OBJECTS

(A: 2 Points) Consider the following code:

```
class Alpha
class Bravo extends Alpha
class Charlie

class Delta extends Bravo with Charlie
```

The above code does not work in Scala. Suppose the developer is attempting to use Charlie as a Mix-In for class Delta, then what is wrong with the above code? (select one)

○ Nothing is wrong with the code

○ Charlie must be an abstract class

◉ Charlie must be a trait   ✔

○ Classes Alpha, Bravo and Charlie must all be abstract

○ the class Alpha must be abstract

(B: 2 points) Consider the following code

```
class Alpha { def foo = { println("wat?") } }
class Bravo extends Alpha { override def foo = { println("xkcd") } }

def foobalizer(a:Alpha) = { a.foo() }

foobalizer(new Bravo)
```

What is printed in the above code? (select one)

○ This code will not print anything because println is never called

○ This code has a bug and it will not run

◉ xkcd   ✔

○ wat?

Correct

Marks for this submission: 4.00/4.00.