

UNIVERSITY OF ESSEX

School of Computer Science and Electronic Engineering

Progress Test EXAMPLE (Week 8) 2019-20

ADVANCED PROGRAMMING

Time allowed: **35 minutes**

Candidates must answer **ALL** questions.

The paper consists of **NINE** questions in total (**the actual test will have 20 questions**). All questions are of equal weight.

The progress test is worth 15% of the total assessment for this module.

THE QUESTION PAPER MUST NOT BE REMOVED AND WILL BE COLLECTED WITH YOUR ANSWER SHEET.

CANDIDATES MUST REFER TO THE FOLLOWING PAGE FOR FURTHER INSTRUCTIONS.

Please do not leave your seat until the end of the test unless you are given special permission by an invigilator.

Do not communicate in any way with any other candidate in the room.

Do not open the question paper until told to do so.

All answers must be written on the machine-readable form.

At the end of the test, remain seated until your papers have been collected and you have been told you may leave.

Answers must be written on the multiple choice answer sheet (machine-readable form). Note that there is only one choice that constitutes the correct answer to each question. The correct answer, in this context, is the most accurate and complete answer to the question, among those given.

ON THE MACHINE READABLE FORM PLEASE ENSURE THAT YOU COMPLY WITH THE FOLLOWING REQUIREMENTS:

- I. Write your name in the box headed “**Candidate Name**”.
- II. Write your “**Student Registration Number**” in the boxes provided, and enter the same information by using the optical marks in the rows adjacent to the boxes (see example).
- III. Write your “**Module Code**” in the box provided, and enter the same information by using the optical marks in the columns beneath the boxes (see example).

THE CORRECT ANSWER FOR EACH QUESTION SHOULD BE MARKED BY STRIKING THROUGH THE CORRESPONDING LETTER ON THE MACHINE READABLE FORM.

Here is an example of how to enter a Registration Number, a Module Code and an answer to a question:

Registration Number 0403579 would be entered using the optical marks in the rows by striking through the characters in the seven rows as follows:

[0] [4] [0] [3] [5] [7] [9]

The Module Code for module CE151 would be entered as follows:

[C] [E] [1] [5] [1]

If you think that answer D is the correct answer for Question 1, then you should strike through the letter ‘D’ as shown below:

1. [A] [B] [C] [~~D~~]

NOTE: If more than one answer is marked for a particular question, it will be counted as giving an incorrect answer to the question.

CE303-6-AU Progress Test (EXAMPLE)

All questions are about programming as taught in CE303.

Question 1

Consider the following Java code:

```
class A {  
    public Integer x;  
}
```

```
class B extends A {  
    public String x;  
}
```

What fields does class **B** have?

- [A]. This code will cause a compiler error
- [B]. One field of type **String**
- [C]. One field of type **Integer**
- [D]. Two fields of types **Integer** and **String**

Question 2

Default method in an Java interface is...

- [A]. A method that a lambda expression overrides
- [B]. A method that has a default implementation
- [C]. A method with default parameter values
- [D]. A method that, by default, requires overriding

CE303-6-AU Progress Test (EXAMPLE)

Question 3

The **@Override** annotation in Java instructs the compiler that...

- [A]. The annotated method overrides a method defined in a superclass
- [B]. Dynamic binding should be used for the annotated method
- [C]. The annotated implementation has to be used even with the superclass objects
- [D]. The annotated method is overloaded

Question 4

Consider the following C# code:

```
class A {  
    public void Print() { Console.WriteLine("A"); }  
}  
  
class B : A {  
    public void Print() { Console.WriteLine("B"); }  
}
```

What is the name of the mechanism demonstrated in this code?

- [A]. Overloading
- [B]. Shadowing
- [C]. Polymorphism
- [D]. None of the above

CE303-6-AU Progress Test (EXAMPLE)

Question 5

According to the Flynn's taxonomy, what is the architecture of a machine with one CPU with multiple cores?

- [A]. Single Instruction Single Data (SISD)
- [B]. Single Instruction Multiple Data (SIMD)
- [C]. Multiple Instructions Single Data (MISD)
- [D]. Multiple Instructions Multiple Data (MIMD)

Question 6

Two threads in Java are sharing a variable

```
AtomicInteger x;
```

The value of **x** is initially 0, and then both threads execute the following command at exactly the same time:

```
x.incrementAndGet();
```

What will be the value of **x** after that?

- [A]. 0
- [B]. 1
- [C]. 2
- [D]. The result cannot be predicted

CE303-6-AU Progress Test (EXAMPLE)

Question 7

You are given a Java function **f()** defined as follows:

```
void f(List<Integer> ... list) {}
```

Which of the following lines will compile without an error?

[A]. **f(1, 2, 3);**

[B]. **f(new List[0]);**

[C]. **f(new List<List<Integer>>());**

[D]. **f(new Integer[0]);**

Question 8

Suppose you need to frequently edit and query a set of integers in the range [1,20]. Which of the following Java collections would usually be the best choice in terms of performance?

[A]. **HashSet<Integer>**

[B]. **TreeSet<Integer>**

[C]. **HashMap<Integer, Boolean>**

[D]. **BitSet**

CE303-6-AU Progress Test (EXAMPLE)

Question 9

Generics are parametrised with type variables. Which of the following types is **not allowed** for a type variable in Java?

- [A]. Object
- [B]. Integer
- [C]. double
- [D]. Interface **List<>**

END OF THE PROGRESS TEST