

CS_141 Principles and Practice of Programming

(Attempt 2 questions out of 3)

Question 1.

- (a) Explain the Object–Oriented concept of *encapsulation*. Your answer should include references to the four privacy modifiers. [10 marks]
- (b) Write a *while* loop and a *for* loop, both of which will print the integers from 1 to 100 to the screen. [6 marks]
- (c) Explain what is meant by a *static* field, giving an example of its use. [6 marks]
- (d) Where is a field visible if it is declared as *protected*? [3 marks]

Question 2.

- (a) Explain the Object–Oriented concept of *polymorphism*. Your answer should include references to *static* and *dynamic* binding, *collection* objects, and *casting*. [10 marks]
- (b) Describe the format of a *switch* statement. When would you use a switch statement instead of an *if-then-else* statement? [7 marks]
- (c) What is the difference between *accessor* method and *mutator* methods. [5 marks]
- (d) What does it mean for a field to be declared as *final*? [3 marks]

Question 3.

(a) Explain the Object–Oriented concept of *inheritance*. Give a simple example of an inheritance structure. Your answer should clearly show the role of *constructors* in inheritance.

[10 marks]

(b) What is the difference between method *overloading* and method *overriding*?

[5 marks]

(c) Where is a field visible if it is declared as:

1. Private
2. Public

[4 marks]

(d) What is a static method? Give an example of a static method and explain how it is invoked.

[6 marks]