

CS_141 Principles and Practice of Programming

(Attempt 2 questions out of 3)

Question 1.

- (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) Write a *repeat* loop, and a *while* loop, both of which will write the first ten integers to the screen. [6 marks]
- (c) What is meant by the Java keywords *static* and *final*? [6 marks]
- (d) Where is a method visible if it is declared as *protected*? [3 marks]

Question 2.

- (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) When would you use a *switch* statement? Write a switch statement which evaluates an integer, printing the value of the integer in words to the screen if it is between 1 and 3, otherwise prints an error message. [7 marks]
- (c) Explain the use of the java keyword *super*. [5 marks]
- (d) Where can a field be accessed if it is declared as *private*? [3 marks]

Question 3.

- (a) Explain the Object–Oriented concept of *encapsulation*. Your answer should include references to the four privacy modifiers. [10 marks]
- (b) Explain, giving an example, the use of a *for* loop. [5 marks]
- (c) Explain, with examples, the use of the java keyword *this*, and the reason for its use. [5 marks]
- (d) Explain the difference between *top–down* and *bottom–up* program design. [5 marks]