



1.2.4 Object-Oriented Languages

1. An object oriented system is implemented to organise information about worker's attendance at a warehouse.

a) State the meaning of each of the following terms:

- i. Object
- ii. Method
- iii. Attribute

[3 marks]

Each worker has a name and an attendance figure which can be between 0 and 100.

- b) Write a definition for a fully encapsulated customer class, providing both get and set methods for all attributes. You do **not** have to write code for the constructor method.

[5 marks]

2. A program is written using an object-oriented programming paradigm and uses a class called Video to organise the videos that are streamed to customer.

The class video has these attributes:

- Name
- Number of views
- Star rating

The constructor method will set the name attribute to the name that is passed in as a parameter. The constructor will also initially set the number of views to 0 and the star rating to 3.

- a) Write program code or pseudocode to declare the class video and initialise the required attributes as private.

You should include **both** the attribute definitions and the constructor method in your answer.

[7 marks]





3. A video game has treasure that players can pick up as they move around the map.

Below is part of the code from the game.

```
class Treasure

    private value
    private weight
    private name

    public procedure new(givenName)
        name = givenName
        weight = 20
        value = randomInteger(1, 20)
    endprocedure

    public procedure changeName(givenName)
        name = givenName
    endprocedure

endclass

class TreasureChest inherits Treasure

    private locked

    public procedure new(givenName)
        super.new(givenName)
        locked = false
        value = randomInteger(1, 100)
        weight = randomInteger(80, 120)
    endprocedure

    public procedure picklock()
        if getRandomNumber() > 0.5 then
            locked = false
        endif
    endprocedure

endclass
```

- a) Explain what is meant by the term ‘encapsulation’ with reference to the attribute called name.

[3 marks]





b) Describe what is meant by the term 'inheritance' referring to the code above.

[3 marks]

c) Identify **all** attributes and methods in the TreasureChest class. Clearly mark which are which.

[2 marks]

4. Procedural programming and object-oriented programming are two paradigms commonly used by programmers when developing computer games.

Discuss the advantages of using object-oriented programming over procedural programming when developing computer games. You should refer to inheritance, encapsulation and polymorphism in your answer.

[12 marks]

