# Homework 1 Basic concepts of OOP Answers

1. (a) Explain the difference between a class and an object. [2]

 A class is a blueprint for objects of the same class type, whereas an object is one instance of the class type.

 (b) **Encapsulation** is a fundamental principle of OOP.

 Explain what is meant by encapsulation. [2]

 Attributes and methods are wrapped into a single entity

2. A program is to store and update details for many bank accounts.

 (a) (i) What class would be used in this program? BankAccount *(or other name)* [1]

 (ii) Give an example of an object in this class. MyBankAccount *(or other name)* [1]

 (b) For the class given in (a)(i), list

 (i) three possible attributes. AccountNumber, AccountHolderName, Balance, AccountType, OverdraftLimit, (accept other reasonable answers) [3]

 (ii) two possible methods. constructor, getBalance, withdrawFunds,
depositFunds, getAccountHolderName, etc.. [2]

3. An object-oriented program is to be used to store and display details of members of a sports club.

 A member class is defined which holds attributes surname, first name, annual membership fee, and methods to amend and display these details.

 An incomplete definition of the Member class is given below.

 (a) Add statements to complete procedure **constructor**, where indicated. [2]

 class Member

 private surname

 private firstname

 private annualFee

 public constructor(mySurname, myFirstName, myAnnualFee)

 (complete procedure here)

 surname = mySurname

 firstName = myFirstName

 annualFee = myAnnualFee

 endprocedure

 *(other procedures – do not complete)*

endclass

(b) What is the purpose of a constructor? [1]

 Instantiate an object of the given class and give the object’s attributes initial values

 (c) Write a statement to instantiate a member called Harry Mason, annual fee £25.00. [2]

 member123 = new Member("Mason", "Harry", 25.00)

 *(identifier member123 is just an example – accept any valid identifier))*

 (d) Write a method which will amend the annual fee of a member. [2]

 public procedure amendAnnualFee(myAnnualFee)

 annualFee = myAnnualFee

 endprocedure

 (e) Write a statement to amend the annual fee of member Harry Mason to £30.00. [2]

 member123.amendAnnualFee(30.00)

 *(identifier should match that given in (c))* [Total 20 Marks]