



Open University *of* Mauritius

BSc (Hons) Applied ICT with Specialisation [OUbs017]

EXAMINATIONS FOR:	Nov/Dec 2015 – Year 2 Semester 1
MODULE:	Object Oriented Programming (OUbs017214)
DURATION:	2 HOURS
READING TIME:	10 Minutes

INSTRUCTIONS TO CANDIDATES

1. This paper consists of **3 Structured Questions**
2. Answer **ALL** questions
3. Always start a new question on a fresh page.
4. Total marks: 100.

This question paper contains 3 Structured Questions and 4 pages.

ANSWER ALL 3 QUESTIONS

QUESTION 1 [40 MARKS]

- a) Define the following terminologies as used in Object Oriented Programming and provide an example of each:
- a. Function
 - b. Instance Variable
 - c. ArrayList
 - d. Float
 - e. MultiThreading

[10 MARKS]

- b) Build a class CreateVehicles that creates an array of 2 vehicle objects with the following information:

2 Sports cars

number of tyres: 4

accessories: No

brand: Mercedes

carNumber: MER 5505

number of tyres: 4

accessories: Yes

brand: Audi

carNumber: AUD 1203

You should also print the details of each vehicle stored in the array.

[5 MARKS]

- (i) One of the main concepts of Object Oriented Programming is Encapsulation. Create two classes namely: Class Vehicle and Class VehicleImpl. The class Vehicle has 3 attributes namely noOfTyres, accessories and brand which are of type integer, Boolean and String respectively. The constructor of the class initialises all 3 variables. The class Vehicle also has accessor (Set and Get) methods for all 3 variables and a method PrintDetails that displays the vehicle details.

The class VehicleImpl implements the class Vehicle and initialises its variables.

Implement the class Vehicle and the class VehicleImpl.

[10 + 5 MARKS]

- c) Using the collection of LinkedList, write a java program that will declare, and insert 3 values in a LinkedList called friends. The program should then display the size and the second element of the LinkedList.

[10 MARKS]

QUESTION 2 [30 MARKS]

- a) Explain the concept of polymorphism with the help of an example. **[8 MARKS]**
- b) Draw a UML Class diagram for a simplified employee management system. The scenario is as described below:
- A company has a name and a list of employees.
 - Each employee has the following attributes: employeeNumber, name, salary and is assigned to a Manager
 - Each Manager can manage multiple employees (as a team) and can also add new employees to the team
 - The company also employs Contractors on fixed duration contracts. Each contractor has the following attribute: lengthOfContract

The class diagram needs to include the Set and Get methods for each of the attributes mentioned in the scenario.

[12 MARKS]

- c) Draw a UML Sequence Diagram to model the behaviour of an ATM machine that has 4 functions namely deposit, withdrawal, balance and transfer.

[10 MARKS]

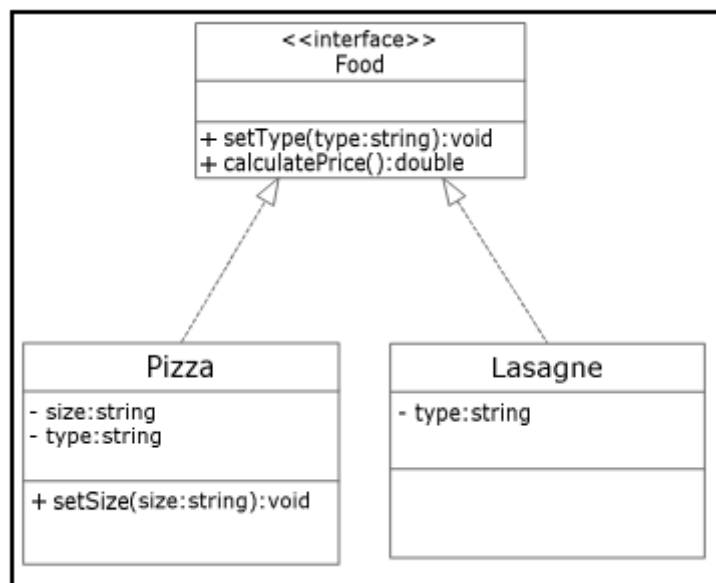
QUESTION 3 [30 MARKS]

Delisimo Resto is a restaurant specialised in Italian food. It provides different menus consisting of pizza and lasagne dishes to its customers.

The table below shows the prices for the different types of pizza and lasagne sold at Delisimo Resto.

Pizza			Lasagne	
Size	Type	Price (Rs)	Type	Price (Rs)
Small	Veg	80	Veg	200
	Nonveg	125		
Medium	Veg	175	Nonveg	300
	Nonveg	225		
Large	Veg	250		
	Nonveg	275		

The following UML diagram shows two classes, namely Pizza and Lasagne, both implementing the Food interface.



(i) Write java codes for the interface Food.

[10 Marks]

(ii) Give the java implementation of the concrete class Lasagne.

[10 Marks]

(iii) Give the java implementation of the concrete class Pizza.

[10 Marks]