

# UNIVERSITY OF MAURITIUS

## FACULTY OF INFORMATION, COMMUNICATION AND DIGITAL TECHNOLOGIES



### SECOND SEMESTER EXAMINATION

MAY 2017

PROGRAMME	MSc Software Project Management		
MODULE NAME	Requirements Management and Testing		
DATE	Wednesday 10 May 2017	MODULE CODE	CSE 6098
TIME	09:30 – 12:30 Hrs	DURATION	3 Hours
NO. OF QUESTIONS SET	4	NO. OF QUESTIONS TO BE ATTEMPTED	4

#### Instructions to Candidates

This question paper consists of **4 questions**.

**Answer ALL Questions**

**Question 1 [25 MARKS]****Case Study: Restaurant Pierre**

Mr Pierre is the owner and manager of the restaurant 'Pierre's'. This is a popular French restaurant, with a lot of repeat trade that is busy most evenings and full at weekends. The restaurant is only open in the evenings and seats 50 customers with only one service per night.

Currently all bookings are received over the telephone. On answering the call, Mr Pierre always requests the required date and the number of guests to be seated. He then checks to see if the booking can be accommodated. Where the booking can be accommodated, he asks the customer for further booking details including the booking name, contact number and number of people in the booking. He then logs the booking into the restaurant diary under the relevant date. Mr Pierre also asks whether there are any special dietary requirements or whether the booking is for a special occasion such as birthday or anniversary, so he can arrange for birthday cakes, balloons, special wines etc. Mr Pierre always reads the details he has taken back to the customers so that they can confirm their bookings. If the restaurant is full on the required evening, Mr Pierre offers an alternative date for the booking or, if this is not acceptable, asks if the customer would like to be added to a waiting list. The waiting list is recorded at the bottom of each page in the diary and a contact name & number along with number of people in the booking is taken. This enables Mr Pierre to view bookings regularly and manage changes to bookings should someone cancel or change their booking. On a daily basis the Head Chef, Jacques, will check the diary to see if there is any special dietary requirement he needs to be aware of that day. Francoise, the Head Waiter, also prints the diary each day in order to draw up a table plan for each service.

As the restaurant is so busy Mr Pierre would like to start opening lunch times but currently the telephone bookings are taking up too much of his time. Further, Mr Pierre has received feedback from his customers that they cannot sometimes get through to book as the phone line is busy.

In response to this, Mr Pierre has decided to invest in an on-line booking system that would enable customers to make reservations on-line. Mr Pierre is keen that the new system does as a minimum what his current restaurant diary enables him and his staff to do. The hope is that this will reduce the telephone calls as well as provide an alternative method of booking at his restaurant which has been requested by for his loyal customers.

You are involved in the requirements elicitation phase of this project.

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**Question 1** (*Continued*)

- (a) Explain what is meant by requirements elicitation?  
[2 marks]
- (b) Identify three (3) roles of the Requirements Engineer during requirements elicitation?  
[3 x 1 marks]
- (c) Explain, using examples, how you will use the following techniques for requirements elicitation in this online booking system project.  
(i) Scenarios  
(ii) Prototyping  
[5 + 5 marks]
- (d) Draw a use case diagram identifying the Actors and Use Cases required for the Pierre's restaurant on-line booking system.  
[10 marks]

**Question 2** [25 marks]

- (a) Explain what is meant by Requirements Prioritisation and discuss four (4) aspects that need to be considered during Requirements Prioritisation?  
[2 + 4 marks]
- (b) Describe how each of the following techniques can be used for prioritising requirements?  
(i) MoSCoW  
(ii) AHP  
(iii) BPL  
[3 x 4 marks]
- (c) "*Buying a Requirements Management tool does not guarantee that all requirements will be successfully managed*". Discuss two (2) success factors for using a Requirements Management tool.  
[4 marks]
- (d) Identify three (3) factors influencing traceability policies?  
[3 marks]

**Question 3 [25 marks]**

- (a) Discuss the issues with the following statements that have been taken from a specification document:

1. "When the user selects the Compact Memory option, the program will compress the data as small as possible using a sparse-matrix approach."
2. "The software shall allow up to 10 million concurrent connections, although no more than 1 million will normally be used."

**[2 x 2 marks]**

- (b) Explain why Software Testing is considered to be a risk-based exercise?

**[5 marks]**

- (c) Consider a software module that is intended to maintain the inventory of products in a retail store. The module is intended to accept the name of a product and a list of the different weights the product comes in. The weights need to be specified in kilograms. The specifications state the following:

- The product name is to be alphabetic characters 2 to 25 characters in length.
- Each weight may be a value in the range of 1 to 75, whole numbers only.
- The weights need to be entered in ascending order (smaller sizes first).
- A maximum of five weights may be entered for each product.
- The product name is to be entered first, followed by a comma, then followed by a list of weights. A comma will be used to separate each weight.
- There may be spaces (blanks) anywhere in the input.

- (i) Identify twelve (12) different equivalence classes for the product input

**[6 marks]**

- (ii) Derive a set of ten (10) black box test cases for the product input. For each test case, show the test data, expected outcome and the equivalence classes covered.

**[5 marks]**

- (iii) Explain why it is important to conduct both Equivalence Partitioning and Boundary Value Analysis.

**[2 marks]**

- (d) Explain why Branch Coverage is considered to be a stronger criterion than Statement Coverage?

**[3 marks]**

**Question 4 [25 marks]**

- (a) The implementation of Software Configuration Management within an organisation goes through several phases. Describe four (4) of those phases.  
[4 x 2 marks]
- (b) Prepare a checklist consisting of five (5) key questions which can be used for selection of configuration items.  
[5 x 1 marks]
- (c) Three developers Nate, Sam and Linda are working on a development item which is currently at version 5.2. Nate keeps working on the main development line until version 5.5. Sam wants to add new experimental features and creates a branch at version 5.3. Sam creates another 2 versions in that branch. Linda wants to do some bug fixes and creates a branch at version 5.4 and creates another three versions in that branch. Nate also decides to test new features and creates a second branch at version 5.3, with 2 additional versions in that second branch. Draw a diagram illustrating the different version numbers and branches.  
[3 marks]
- (d) Consider a version control tool such as SVN.
- (i) Describe the steps required to add an existing project, comprising of source code, to this version control tool.  
[2 marks]
- (ii) Explain how you would create a working copy of the project and use the Diff feature.  
[2 + 2 marks]
- (e) Discuss, using appropriate examples, how Configuration Management can be adapted to support distributed Agile teams?  
[3 marks]

**END OF QUESTION PAPER**