

# **UNIVERSITY OF MAURITIUS**

## **FACULTY OF INFORMATION COMMUNICATION AND DIGITAL TECHNOLOGIES**



### **SECOND SEMESTER EXAMINATIONS**

**MAY 2017**

PROGRAMME	BSc (Hons) Software Engineering Year 1		
MODULE NAME	Software Engineering & Computing		
DATE	Thursday 04 May 2017	MODULE CODE	CSE1009Y(1)
TIME	09:30 – 12:30 Hrs	DURATION	3 Hours
NO. OF QUESTIONS SET	4	NO. OF QUESTIONS TO BE ATTEMPTED	4

### **INSTRUCTIONS TO CANDIDATES**

There are 2 Sections in this paper: Section A and Section B.

Answer all questions from each Section.

Use separate answer books for each Section.

SECTION A

**Answer all questions.**

**Use separate answer books for each Section.**

**Question 1- [25 marks]**

Mr Jones has been posted to work in an African country where there is no internet connectivity. He has to bring along his personal computer with him as he will have to make a presentation. However, before going abroad Mr Jones has decided to format his personal computer. You are a close friend of Mr Jones and he has solicited your help on the following:

- a) Explain to Mr Jones ,the difference between System Software and application software.  
[4 marks]
- b) Compare and Contrast Linux with Windows  
[4 marks]
- c) Discuss the importance of having an anti-virus software installed on his PC and recommend him **ONE** such software  
[4 +1 marks]
- d) Briefly comment on the importance of Back up. Propose **ONE** back up technique that Mr Jones can use, justifying your answer.  
[3 + 5 marks]
- e) Mr Jones has recently heard about the term Software as a Service (SaaS). Explain to him this concept  
[4 marks]

**Question 2 - [25 Marks]**

- a) The computer consists of four generations. Briefly explain how data storage had evolved during these 4 generations. **[4 marks]**
- b) Suggest **TWO** ways in which a company can benefit from the setting up of a network. **[4 marks]**
- c) List **THREE** advantages of storing data in databases in any company. **[3 marks]**
- d) We're all aware of the technology price curve: When first introduced, products have the highest prices and the most instability. As these products settle into the market, they become more reliable and the prices fall, sometimes very quickly. People who make those first-release purchases are called early adopters.
- i. Discuss about the advantages of being an early adopter **[3 marks]**
- ii. Elaborate on the disadvantages of being an early adopter **[3 marks]**
- e) A lot of computer crimes happen on the internet nowadays. Briefly discuss the concept of computer crimes on the internet and suggest any **TWO** precautions to be taken. **[3 + 2 marks]**
- f) Elaborate on the concept of social networking. **[3 marks]**

SECTION B

Answer all questions.

Use separate answer books for each Section.

Question 3 - [25 marks]

MoJob is an agency that specialises in placing temporary secretaries into various companies in the city. Secretaries apply to register with MoJob for temporary work by either sending their details as a CV or filling in a MoJob application form online. Secretaries whose applications have been successful are interviewed by one of the agency's senior advisors to decide which category they should be allocated to. There are four main categories of secretarial work, which require different skills. Secretaries would be taken off the register at their request. Also if a secretary had not been placed for three months a manager reviews the circumstances and might decide to let the registration lapse and the applicant is sent a letter to this effect.

Client companies looking for temporary secretaries make their bookings with MoJob giving details of secretarial skills they require. Each company's name and address and booking details are held pending action. Previous client details are retained for a period of six months for future business unless the client specifically requests that their details be taken off MoJob's records. MoJob allocates each booking to one or more of the available secretaries who have the required skills MoJob calculates the charges for companies' bookings at different rates based on secretary skills. MoJob pays the secretaries every Friday at different rates according to their skill category and then invoices the client companies.

- (a) Why should stakeholders be consulted during requirement gathering. [2 marks]
- (b) Identify from the case study three functional and three non-functional requirements (*Rewrite the requirements so that they are in line with guidelines for writing good requirements*). [6 marks]
- (c) With the help of example explain the following categories of errors that can be identified when doing Requirement Analysis: **Ambiguities, Platitudes, Omissions**. [3 marks]
- (d) Explain what is a three tier client-server Architecture. Give two Reasons why it would be appropriate for MoJob system. [2+2 marks]
- (e) Explain the waterfall life-cycle model. Give two reasons why it would be suitable to use this model for developing MoJob. [2+2 marks]
- (f) Describe the **Project, Product** and **Business** risks. Identify three possible risks for the MoJob system (**one from each type of risk**). [3 +3 marks]

**Question 4 - [25 marks]**

- (a) Differentiate between **expert judgement, estimation by analogy** and **algorithmic estimation**. [3 marks]
- (b) (i) What type of errors are discovered during black-box testing? [3 marks]
- (ii) Explain the rules behind drawing a flowgraph and how to compute the cyclomatic complexity (You may use an example to illustrate your answer). [3 marks]
- (c) (i) What is Function point analysis and give two advantages of using it to estimate size of a software. [3 marks]
- (ii) Using the COCOMO method: if the number of delivered source code instructions is 125,000 and the value of the constraints a, b and c & d in the Basic COCOMO model are 3.0, 1.12, 2.5 and 0.35 respectively, what is the total effort in person months and the total development time. [2 marks]
- (d) (i) Companies that want to implement a software quality assurance framework needs to implement a quality culture within the company. List four characteristics of a quality culture. [2 marks]
- (ii) What is the difference between process metrics and project metrics. Give an example for each type of metrics. [2 marks]
- (e) (i) Discuss whether a quality software should have high cohesion or low cohesion; and whether loose coupling or tight coupling is advisable when designing software. [2 marks]
- (ii) Identify which type of coupling the following module exhibits, provide justification for your answer. **A Process control module that maintains current data about state of operation, it gets data from multiple sources. Supplies data to multiple sinks.** [2 marks]
- (f) With the help of a diagram explain the maintenance process. [3 marks]

**END OF QUESTION PAPER**