

UNIVERSITY OF MAURITIUS

FACULTY OF ENGINEERING



SECOND SEMESTER EXAMINATIONS

MAY 2016

PROGRAMME	BSc (Hons) Software Engineering (F/T) BSc (Hons) Software Engineering (Mixed Mode)		
MODULE NAME	Software Engineering and Computing		
DATE	Friday 06 May 2016	MODULE CODE	CSE1009Y(1)
TIME	09.30 - 12.30 Hrs	DURATION	3 hours
NO. OF QUESTIONS SET	7	NO. OF QUESTIONS TO BE ATTEMPTED	5

INSTRUCTIONS TO CANDIDATES

There are TWO (2) Sections in this Paper: Section A and Section B.

Section A consists of FOUR (4) Questions. Answer ANY TWO (2) Questions from this Section.

Section B consists of THREE (3) Questions. Answer ALL Questions from this Section.

Questions DO NOT carry equal marks.

Use separate Answer Booklets for each Section.

SECTION A

Answer ANY TWO (2) Questions from this Section.

Use separate Answer Booklets for this Section.

Question 1 [25 marks]

Mr. Chong is the owner of a restaurant chain in Mauritius. Mr. Chong is not computer literate. He has an old PC dated 2005 and now he wants to computerize his restaurant chain to be more profitable. He has solicited your help. Mr. Chong thought that with his old PC he would be able to computerize his business at a low cost.

- a) Explain to Mr. Chong why he cannot use his old PC as it is. Propose him an alternative to his old PC

[3 +1 marks]

- b) Identify how Mr. Chong can computerize his business at a low cost.

[2 marks]

- c) Appraise the importance of **TWO** utility programs to be included in his PC.

[4 marks]

- d) You also advise Mr. Chong to use Software as a Service. Hence briefly explain the concept of "Software as a Service" to him

[3 marks]

- e) In order to keep data for clients, suppliers and other stakeholders in his restaurant chain, you propose to Mr. Chong that a database is of utmost importance. Explain to him **FOUR** importance of database in his business and Identify **ONE** database that will be more suitable for his business

[4 +1 marks]

- f) To be able to communicate in his business, internet is needed. Describe the role of the Internet in his business and list **THREE** devices needed to set up an internet connection in his business.

[4+3 marks]

Question 2 [25 marks]

- a) You've embarked on a position as a freelance editor. You'll be using your own computer. Until now, you haven't worried too much about backing up your data. Now, however, it's extremely important that you back up all your work frequently.
- i) List **THREE** back up options that are available [3 marks]
- ii) Justify which type of back up listed in part(i) you would prefer [3 marks]
- b) One of the main functions of the Operating system is "*Memory and Storage management*". Explain the concept of Memory and Storage management. [4 marks]
- c) Differentiate between Client/Server and Peer to Peer network. [3 marks]
- d) Elaborate on the concept of social networking. [3 marks]
- e) Privacy management is very important on social networking websites. Propose **FOUR** precautions to consider ensuring privacy on these websites. [4 marks]
- f) You wish to draw to the attention of your IT Manager that a lot of computer crimes happen on the internet nowadays. Briefly discuss the concept of computer crimes on internet to him and suggest to him **TWO** precautions to be taken. [3+2 marks]

Question 3 [25 marks]

- (a) Explain the following terms, as they apply to the hardware and peripheral device management in computers.

- (i) Device driver
- (ii) Plug and Play (PnP)

[2+2 marks]

- (b) Provide a discussion of the security and privacy concerns in **cloud computing**.

[4 marks]

- (c) (i) What are real-time operating systems?

- (ii) Write down **TWO** devices/appliances that use real-time operating systems.

[2+3 marks]

- (d) (i) What is an End User License Agreement as it applies to software licenses?

- (ii) What does an End User License Agreement state?

[2+4 marks]

- (e) Assume that you and your classmates have set up a wireless network in a lab. Propose **TWO** ways to enforce some preliminary level of security in the wireless network.

[2 x 2 marks]

- (f) Write down the complete URL, given that you wish to view a file "javaprogramming.pptx", located in a subfolder named chapter1 which has a parent folder CSE1009Y on a web site whose domain name is softengg.intnet.mu. The server that hosts this file has name albatross. Assume that the website has a secured connection.

[2 marks]

Question 4 [25 marks]

- (a) Assume that you are in possession of an old and partially tarnished coloured digital picture. Write down **FOUR** facilities that a digital image editing software would offer to you in order to improve the quality and appearance of the picture.

[4 x 1 marks]

- (b) Explain each of the following terms as they are used in computer networks.

- (i) Extranet
- (i) Virtual Private Network (VPN)

[2+2 marks]

- (c) (i) Define the term digital computer.
(ii) Outline some tasks that can be performed by a digital computer.

[1+2 marks]

- (d) (i) Explain in detail the **FOUR** steps associated with the boot process of a computer.
(ii) Suggest **TWO** ways to handle errors during the boot process.

[4+2 marks]

- (e) Write down **THREE** prominent features of the Linux operating system.

[3 x 1 marks]

- (f) Assume that you are using a presentation software. Write down **TWO** tips for designing a good presentation.

[2 x 1 marks]

- (g) Explain how people can communicate and collaborate when using Web. 2.0.

[3 marks]

SECTION B

Answer **ALL** Questions from this Section.

Use separate Answer Booklets for this Section.

Question 5 [15 marks]

Paradise Floral Products satisfies the floral and decorative needs of designers, florists, interior decorators, caterers and event planners throughout Mauritius. The company has a number of branches throughout the country in order to be closer to their customers and can provide a better service. The company has decided to implement an IT solution to manage its critical business functions across sales, distribution and financials. All the information on supplier, products and customers have to be stored in a central database. Due to the growing demand for their products and services, the company has to provide the facility of ordering and accepting payment online. The solution implemented should be able to process sales transactions, monitor inventory movement and manage order entry. The proposed solution should be able to interface with existing credit card payments hardware provided by the banks.

With the computerized system, sales figures would be easy to obtain at any given point of time, providing visibility and streamlining retail operations. The company is also able to track orders in real time, manage growth and meet customer expectations for higher service levels to support repeat business. The system would provide user-friendly interface for the staff. To remain competitive, the system has to be reliable. With many branches that exist over the country, the system should be support different platforms on which it can be deployed.

- (a) Explain the difference between direct stakeholders and indirect stakeholders. Give reason why both stakeholders views should be gathered during the requirement analysis phase.

[2 marks]

- (b) List four characteristics of good requirements.

[2 marks]

- (c) 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]

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Question 5 (Continued)

- (d) Explain why a client server architecture would be more appropriate for the system mentioned in the case-study.

[2 marks]

- (e) Identify two software project risks for the a web development project by the software company mentioned in part(a). For each risk identify possible risk categories (project/product/business). Give justifications.

[2+1 marks]

Question 6 [20 marks]

Systems Ltd is a software development company specialising in the development of complex information systems to be used in health sector for companies that has several branches over the country. And many users for the computerized systems. Systems Ltd has a large team of 500 developers scattered around different continents. They have recently received a contract for building such a system for a client. The client has stated that the staffs will not be available throughout the duration of the project for feedback. And they want a full-featured application must be delivered within a determined deadline.

- (a) Systems Ltd has identified several activities that need to be completed. The activities of this project with their respective durations and dependencies is given in Table 1. Draw an activity network diagram consisting of the early start, duration, early finish, late start, slack and late finish times.

Activity	Dependency	Duration (months)
A	-	10
B	-	25
C	-	30
D	B	10
E	B	5
F	D	10
G	D	15
H	A	20
I	E, G	10

Table 1: Task Dependency

[7 marks]

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Question 6 (Continued)

- (b) (i) Evaluate, giving justifications, whether Systems Ltd should adopt a Waterfall or Agile Methodology for this project.

[3 marks]

- (ii) Give two main characteristics of the incremental life cycle model.

[2 marks]

- (c) A system specification for the health care systems describes 9 inputs, 2 of which are described as 'simple', 5 as 'average' and 2 as 'complex'. The system has 2 outputs, both of which are considered as 'average'. The system can be queried via 4 commands, which are considered to be 'complex' to implement. The system uses a file for user details, the implementation of which is considered 'simple' and another file for holding logs of conversations which is considered as 'average'. The system uses a standard protocol for interface to the Internet which is considered a 'simple' implementation. Use Table 2 below to calculate the number of function points in the system, assuming that the adjustment factor is 50.

COMPONENT	COMPLEXITY LEVEL		
	simple	average	complex
Input	3	4	6
Output	4	5	7
Inquiry	3	4	6
Internal File	7	10	15
Interface	5	7	10

Table 2: FP Weight**[3 marks]**

- (d) Software is the most expensive element of all computer-based system. A large cost estimation error can make the difference between profit and loss.

- (i) Explain why software cost estimation is difficult.

[1 mark]

- (ii) List and briefly describe two techniques for estimating software cost.

[2 marks]

- (iii) Give two reasons as to why software project management is difficult.

[2 marks]

Question 7 [15 marks]

- (a) (i) Write down and explain three stages of the Capability Maturity Model quality standards. [3 marks]
- (ii) Draw a diagram to show the different processes involved in maintenance. [3 marks]
- (b) (i) What is the difference between test case and test data? [2 marks]
- (ii) Briefly explain the difference between bottom-up testing and top down integration testing. [2 marks]
- (iii) A supermarket has decided to give rebate to its customers based on the amount of money they spent for their end of month purchase. In order to test the software that calculates the rebate, we can identify the ranges of purchase amount that will earn customer a percentage of rebate. For example, if the amount in the range Rs1000 up to Rs2000 has a 3% rebate, a purchase amount over Rs2000 and up to Rs5000 has a 5% interest rate, and balances over Rs5000 have a 7% rebate.
- Identify the equivalence classes and four boundary values to test the software. [3 marks]
- (c) (i) According to you, what type of cohesion does the following method exhibit?
- Update record in data base and send it to the printer. [1 mark]
- (ii) According to you, what type of coupling does the following method exhibit?
- The print routine of the customer billing accepts a customer data structure as an argument, parses it, and prints the name, address, and billing information [1 mark]

END OF QUESTION PAPER