



MALAYSIAN INSTITUTE OF INFORMATION TECHNOLOGY

**FINAL EXAMINATION
JANUARY 2016 SEMESTER**

SUBJECT CODE : ISB16103
SUBJECT TITLE : INTRODUCTION TO SOFTWARE ENGINEERING
LEVEL : BACHELOR
TIME / DURATION : 9.00 am – 11.30 am
(2 ½ HOURS)
DATE : 25 MAY 2016

INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper CAREFULLY.
3. This question paper consists of five questions, answer only FOUR (4) questions.
4. Please write your answers on the answer booklet provided.
5. Answer all questions in English.

THERE ARE 10 PAGES OF QUESTIONS, INCLUDING THIS PAGE.

SECTION A (Total: 100 Marks)**INSTRUCTION: Answer any FOUR questions out of five.****Please use the answer booklet provided.****Question 1**

Mr. Marzuki is a requirements engineer working for Carigali Holding and is currently involved in a software project. He is now in the requirements elicitation and analysis stage. Before he can proceed to the next step or level, the following issues must be resolved.

- a. Identify the possible source that can be used by Mr. Marzuki to get the requirements. (1 mark)
- b. Suggest several elicitation techniques which can be opted by Mr. Marzuki to collect knowledge about system requirements. (4 marks)
- c. Propose the process activities that should be carried out by Mr. Marzuki during the elicitation and analysis stages. (6 marks)
- d. After the requirements are elicited, it is the responsibility of the requirements engineer to document all the requirements. In order to produce correct requirements specifications, the requirements engineer needs to follow specific requirements writing guidelines. Suggest the appropriate requirements guidelines that can be used by Mr. Marzuki for writing the requirements specification. (6 marks)

- e. The main and most important task in requirements engineering is to document the requirements for the system in a suitable manner. The system requirements can be documented in five different ways. Name all the options Mr. Marzuki can choose to document the requirements. (5 marks)
- f. After the elicitation and analysis phase, Mr. Marzuki and his team need to go through a validation phase, which requires several checking. Determine how those requirements can be validated. (3 marks)

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Question 2

The efficiency of the software processes in an organization can lead to benefits such as cost savings, improved software quality and faster time to market. Software processes include those activities, methods, practices, and transformations that are used to create and maintain software products.

- a. Software projects have to be professionally managed and developed. The software development will require the application to use specific techniques and method. Give your opinion on the best software engineering techniques and methods. Justify your answer. (5 marks)
- b. The design process is part of the software engineering cycle and has various design activities. Name and explain each of the design activities. (12 marks)
- c. There are many different types of software system and there is no universal set of software methods. The software methods are dependent on the software system. Explain the dependent choice of software engineering methods. (4 marks)
- d. As a software developer of a project you are assigned to plan and prepare the budget / estimation on the software and hardware requirement. Identify the item that will require higher costs, the costs of software or hardware? Give your reasons. (4 marks)

Question 3

Analyze the following highly simplified procedure, then answer the following questions :

Ask: "What type of ticket do you require, single or return?"

IF the customer wants 'return' Ask: "What rate, Standard or Promotion?"

IF the customer replies 'Promotion' Say: "Total Price is RM12.40"

ELSE Say: "Total Price is RM19.50"

ENDIF

ELSE Say: "Total Price is RM10"

ENDIF

- a. Generate a control flow graph for the above procedure. (11 marks)
- b. Given the following test conditions:
- Test 1 : Single ticket
Test 2 : Return ticket with promotion
- i. Calculate the statement coverage achieved by each test case (3 marks)
- ii. Calculate the decision coverage achieved by each test case (3 marks)
- c. Determine how many tests are required to achieve 100% branch / decision coverage. (2 marks)
- d. Write the list of possible test cases to achieve 100% decision coverage. (6 marks)

Question 4

Good software project management is essential if software engineering projects are to be developed on schedule and within budget. The risk management is now recognized as one of the most important project management tasks. Assume yourself working as a project manager who is responsible for a software development project, an *Online System for Lembaga Penduduk dan Pembangunan Keluarga Negara (LPPKN)* project. Answer the following questions carefully.

- a. As a project manager, you are responsible to conduct risk management activities. Identify the processes involved in the risk management. (8 marks)
- b. After a serious discussion, your team has identified the following risks (i – v). Your next task is to perform risk categorization. Therefore, carefully analyze the following problems and address each problem to the right risk category. (5 marks)
- i. Your team is using NetBeans for your project development. However, the tool does not perform as anticipated.
 - ii. In the middle of the development progress, Eusoff, an experienced team member received a new job offer and will be leaving for good.
 - iii. Your team discovered that a competitive product is marketed before your system is completed.
 - iv. You were informed by the supplier that hardware which is essential for the project will not be delivered on schedule due to unavioded reasons.
 - v. Your team faces a project delay that leads to late system delivery.

- c. Risk planning involves an activity to draw some strategies such as *avoidance*, *minimization*, and *contingency plan* to manage the risk. Assume that you have identified the risk of 'Lack of PHP programmer' at the beginning of the *Online System for LPPKN* project. How should you plan for this specific risk? Propose a risk plan solution that will cater to the :
- i. Avoidance strategy
 - ii. Minimization strategy
 - iii. Contingency plan

(6 marks)

- d. You were assigned by your superior to manage a new software development project. Thus, you are required to choose members of a new team that will work for the new project. As a project manager, you understand about the personality types that will affect the staff motivation. Since you are responsible for this task, describe the type of people that you will consider to be placed in the group.

(6 marks)

Question 5

Assume that your team is working on an inventory system. The system is expected to :

- Add a record
- Delete a record
- Display a record
- Edit a record
- Print a record

The function point metrics is given as follows:
Table 1.0

Parameter Count	Simple	Average	Complex
Inputs	3	4	6
Outputs	4	5	7
Inquiries	3	4	6
Files	7	10	15
Interfaces	5	7	10

In addition, the system is supposed to contain :

- 2 external files
- 3 external interfaces
- 7 user inquiry types
- 8 output types
- 15 input parameters

The software engineer has summarized the complexity factors for the project and provides you with the following Table 2.0 :

Table 2.0

Complexity Factor, Fi	value = 0	value = 1	value = 2	value = 3	value = 4	value = 5
Existing operating environment	0	0	1	0	0	0
Input transaction over multiple screens	0	1	0	0	0	0
Master files updated online	0	0	0	0	0	0
Information domain values complex	0	1	0	0	0	0
Internal processing complex	0	0	1	0	0	0
Conversion / installation in design	0	0	0	0	0	0
Application designed for change	0	0	1	0	0	0
Code designed for reuse	0	0	0	1	0	0
Online data entry	0	0	0	0	1	0
Performance critical	0	0	0	1	0	0
Multiple installation	0	0	0	0	0	0
Backup and recovery	0	0	1	0	0	0
Data communications	0	1	0	0	0	0
Distributed processing	0	0	0	0	0	0

The additional information about the project is given in Table 3.0.

Table 3.0

General Project Information	
Project Manager	Mr. Tengku Mahadi bin Tengku Imran
Lead Tester	Mr. Muhd Hussainy bin Yusoff
Project Start Date	15 March 2016
Project End Date	14 June 2017
Domain	Business Information (Inventory System)
Client	AX Resources Sdn Bhd

Based on the above scenario and information, answer the following questions. You are required to show the detail calculation for each step.

- a. Based on data provided above, identify the EI, EO, EQ, ILF, ELF and CAV. (3 marks)
- b. Having your answer in (a), calculate the unadjusted function point. (3 marks)
- c. Identify the complexity adjustment value. (2 marks)
- d. Then, determine the function point for the above inventory system. (4 marks)
- e. Also estimate the number of programmers to work for this project when you know that the average productivity of your team is 15 function points per month. (4 marks)

- f. Given that RM6500 is the average pay of the programmers, estimate the labor cost for the whole project development. (5 marks)
- g. From your point of view, why is estimation essential in every software project? Give any two reasons. (4 marks)

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END OF QUESTION