



**UNIVERSITI KUALA LUMPUR  
Malaysia France Institute**

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**FINAL EXAMINATION  
SEPTEMBER 2014 SESSION**

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**SUBJECT CODE** : FSB38204  
**SUBJECT TITLE** : SOFTWARE ENGINEERING  
**LEVEL** : BACHELOR  
**TIME / DURATION** : 9.00 AM – 12.00 PM  
( 3 HOURS )  
**DATE** : 4 JANUARY 2015

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**INSTRUCTIONS TO CANDIDATES**

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- 1. Please read the instructions given in the question paper CAREFULLY.**
  - 2. This question paper is printed on both sides of the paper.**
  - 3. Please write your answers on the answer booklet provided.**
  - 4. Answer should be written in blue or black ink except for sketching, graphic and illustration.**
  - 5. This question paper consists of ONE (1) section, Section A. Please, answer five (5) questions only.**
  - 6. Answer all questions in English.**
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**THERE ARE 6 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.**

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**SECTION A (Total: 100 marks)****INSTRUCTION: Answer five (5) questions only.****Please use the answer booklet provided.****Question 1**

- (a) Define the following term.
- i. Software
  - ii. Software engineering.
- (5 marks)
- (b) Determine the type of application for the following statements.
- i. These are applications that execute on a remote computer and that are accessed by users from their own PCs or terminal.
  - ii. These are systems that are primarily for personal use and which are intended to entertain the user.
  - iii. These are software control systems that control and manage hardware devices.
- (3 marks)
- (c) State two (2) attributes of good software.
- (2 marks)
- (d) Sketch the software process model called incremental developmental. This approach interleaves the activities of specification, development and validation. The system is developed as a series of versions (increments), with each version adding functionality to the previous version.
- (6 marks)
- (e) Developing software products (software which can be sold to a customer) can be categorized as generic products and customized products. Distinguish between generic products and customized products. Give one (1) example of each category for these software products.
- (4 marks)

**Question 2**

- (a) Five (5) principal stages of waterfall model consists of requirements definition; system and software design; implementation and unit testing; integration and system testing; and operation and maintenance. Explain each of them.

(10 marks)

- (b) Sketch use case modeling for the Elearn Management System (EMS) based on following scenario:

There are two (2) actors involved in an interaction; called `Student` and `Lecturer`. There are three (3) classes of interaction that link to the actor; `View Record`, `Edit Record` and `Consultation`. `View Record` and `Edit Record` are classes of interaction that link to the actor, `Student` and `Lecturer`. `Consultation` is class of interaction that link to the actor, `Lecturer`.

(5 marks)

- (c) Identify the name of method X as below and state the reason of its creation.

<p>Method X :</p> <ul style="list-style-type: none"><li>• focuses on the code rather than the design</li><li>• is based on an iterative approach to software development</li><li>• is intended to deliver working software quickly and evolve this quickly to meet changing requirements.</li></ul>
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(2 marks)

- (d) Give three (3) problems that arise when implementing agile methods.

(3 marks)

**Question 3**

You are required to develop simulation on Student Attendance System using Fingerprint Technology (SASFT) for Universiti Kuala Lumpur Malaysia France Institute (UniKL MFI). The SASFT uses fingerprint technology to authenticate student for more and secure accurate student attendance records. The fingerprint technology is cheap and easy to be implemented compared to other biometrics technology.

- (a) As a software manager, you have to interact with stakeholders through interviews and observation in order to gather information about required system and existing, and distilling the user and system requirements. Determine four (4) stakeholders (people) that you will meet.

(4 marks)

- (b) You are also required to prepare Software Requirement Specification (SRS) document in order to write system definition for your clients/stakeholders understanding and validate what the software will do. Create the SRS based on the given information :

- i. Introduction
- ii. User requirements definition
- iii. System requirements specification
- iv. System architecture

(16 marks)

**Question 4**

(a) The Patient Islamic Management System (PIMS) is an information system that maintains information about patients for all levels of society, particularly Muslim and recorded the treatments that they have received. As a system engineer, you are required to design and propose a use case modeling in PIMS. The PIMS involves the role *Medical Receptionist* where the actor is able to register, unregister, view information, contact patient and perform treatment.

(6 marks)

(b) Figure 1 shows all states and stimuli for the microwave oven. Identify five (5) stimulus and explain the role of each stimuli specified. The answer should use tabular description.

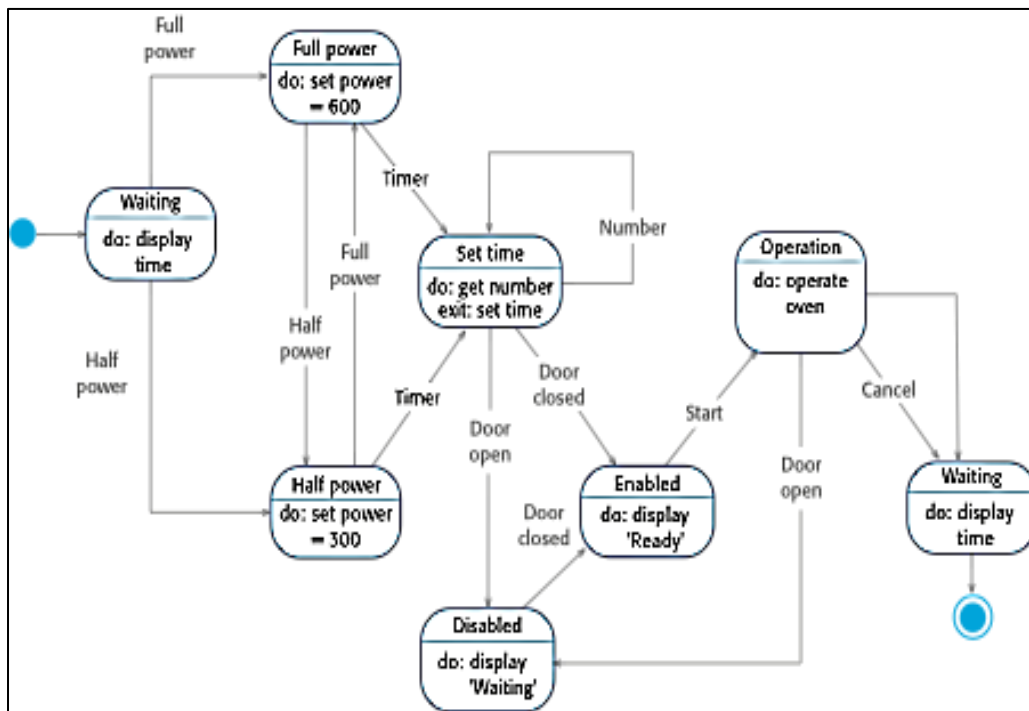


Figure 1: State diagram of a microwave oven.

(10 marks)

(c) Explain two reasons for the use of system model such as context model, interaction model, structural models and behavioral models during the requirements engineering and system design process.

(4 marks)

**Question 5**

- (a) Erickson and Siau (2007) have stated that Unified Modeling Language (UML) has five (5) diagrams types: activity, use case, sequence, class and state diagram which could represent the essentials of a system. Explain three (3) UML diagram types that are commonly used in system modeling.

(6 marks)

- (b) Program testing has two goals which known as validation testing and defect testing. Explain both of them.

(2 marks)

- (c) Name three (3) stages of testing.

(3 marks)

- (d) Software architecture is important because it affects the performance, robustness, distributability and maintainability of a system. Explain the advantages of designing and documenting software architecture based on the following viewer.

- i. Stakeholder communication
- ii. System Analysis

(4 marks)

- (e) Given this scenario of a packing robot control system;

"This robotic system can pack different kinds of object. It uses a vision component to pick out objects on a conveyor, identify the type of objects, and select the right kind of packaging. The system then moves objects from the delivery conveyor to be packaged".

Sketch the architecture of packing robot control system.

(5 marks)

**Question 6**

- (a) State three (3) software engineering code of ethics and professional practice that have been published by IEEE/ACM 1999. (3 marks)
- (b) Draw UML classes and association that show two classes; `Employee` and `Employee Record`. Each employee has exactly a record that maintains information about an employee. Give an example of attribute and operation of `Employee` object. (5 marks)
- (c) Explain the term of web server, application server and database server. (3 marks)
- (d) Software production can be developed using open source software. Give two (2) benefits of using open source software for the development of the software and two (2) open source software that are currently available. (4 marks)
- (e) Figure 2 shows weather station state diagram. Explain how the system state specified as follows responds to requests for various services.
  - i. System state is Shutdown
  - ii. System state is Running
  - iii. A `reportWeather()` message is received

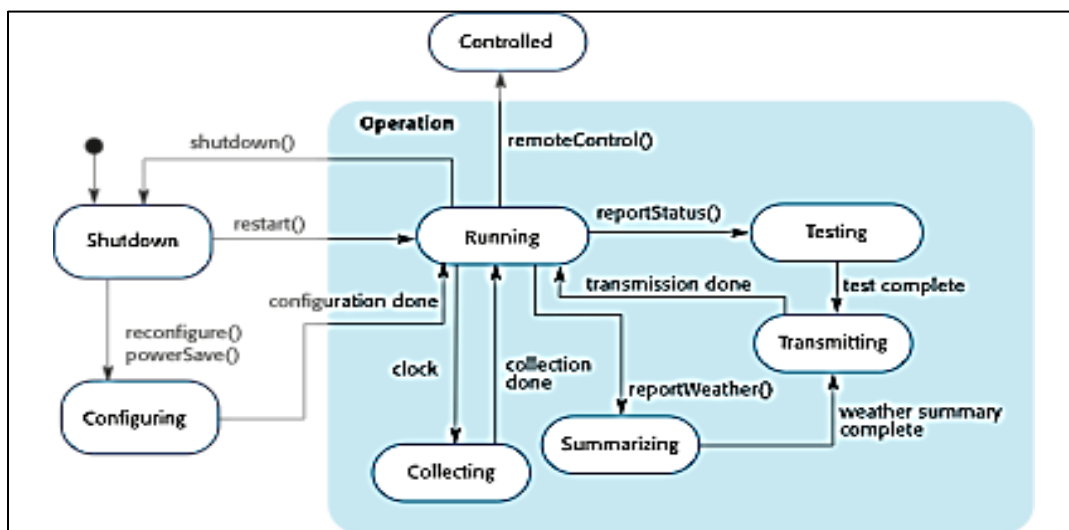


Figure 2: Weather station state diagram.

(5 marks)

**END OF QUESTIONS**