



UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2021/2022**

COURSE NAME : SOFTWARE ENGINEERING PRINCIPLES

COURSE CODE : BIE 10103

PROGRAMME CODE : BIP

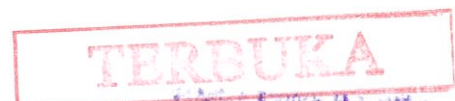
EXAMINATION DATE : JULY 2022

DURATION : 3 HOURS

INSTRUCTION :

1. ANSWER **ALL** QUESTIONS.
2. THIS FINAL EXAMINATION IS AN **ONLINE** ASSESSMENT AND CONDUCTED VIA **CLOSED BOOK**.
3. STUDENTS ARE **PROHIBITED** TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK

THIS QUESTION PAPER CONSISTS OF **FOUR (4)** PAGES



Q1 Answer **Q1 (a)** and **Q1 (b)** based on case study in **Figure Q1**.

A new student who just registered as a student for Universiti Tun Hussein Onn Malaysia (UTHM) needs to fill an application form in order to be a member of Perpustakaan Tunku Tun Aminah (PTTA)UTHM. Then the librarian will process the form and issues a library card member. The new student then can browse the catalog and find an item that he or she wanted to borrow (books, magazines, articles, newspapers, and journals). The student then can borrow the items by bringing them to the counter along with the library card. The librarian records the borrowings and returns the library card and loan items to the student. At some future date, the student returns the loan items to the library. The librarian checks in the items. The student may also reserve a loan item or arrange an interlibrary loan from another library. When these items become available at the library, the requesting student is notified. The librarian maintains the catalog by getting a list of the latest items from book suppliers every month. At the end of each month, the librarian creates an order for the book suppliers. When the items arrive the librarian labels them and makes them available in the catalogs.

Figure Q1

(a) Draw a use case diagram.

(14 marks)

(b) Suggest **THREE (3)** <<extend>> use cases for one of use cases in **Q1(a)**.

(6 marks)

Q2 (a) List **FOUR (4)** methods of writing a system requirements specification.

(4 marks)

(b) Explain a structured specification of a requirement for an insulin pump.

(8 marks)

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- (c) Based on **Figure Q2**, explain **FOUR (4)** non-functional requirements for a transportation system.

University campuses are considered major trip attractors. This intense level of activity generates significant congestion levels within the campuses and in their vicinity, particularly in urban campus settings. With university enrolment trends expected to increase substantially in the next decade, this problem can only be expected to become worse. In addition, university campus settings are multi-modal and complex in nature, incorporating vehicular traffic, transit, and pedestrians into one transportation system. This creates a significant challenge for university campus planners when trying to incorporate their campus master plan into the overall regional or metropolitan transportation system. Systematic approaches to planning for the interaction of the various transport modes (including auto, transit, bicycle, and pedestrians) within the university campus system, and for the integration of these different modes with the larger transportation system, have not been documented. The mix of concentrated levels of pedestrian and bicycle traffic with vehicular congestion in a campus setting creates a number of significant conflict areas that range from pedestrian and cyclist safety to traffic and transit operations. These conflicts are exacerbated by the multijurisdictional nature of these interactions, which involve authorities at the campus, city, and state level.

Figure Q2

(8 marks)

- Q3 (a)** Suggest the suitable architecture to improve security and performance of a system. Support your answer with appropriate nonfunctional requirements.

(4 marks)

- (b) Explain **FOUR (4)** architectural patterns.

(4 marks)

- (c) Answer **Q3 (c) (i)** and **Q3 (c) (ii)** based on **Figure Q3**.

Infinity Optical is an optical shop that owns multiple branches in Malaysia. They have a wide range of optical products such as frames, lens and more. To simplify their work, they have hired a software house to come out with a system that can be used to manage their inventory. This system should be able to be accessed online and they also wanted this system to be mobile-friendly.

Figure Q3

- (i) Design a layered architecture for the Infinity Optical Inventory System.

(6 marks)

- (ii) Draw a user interface design for the system.

(6 marks)

- Q4** (a) Explain why bottom-up and top-down testing might not be inappropriate testing strategies for object-oriented systems.

(4 marks)

- (b) Answer **Q4 (b) (i)** until **Q4 (b) (iii)** based on the case study in **Figure Q4**.

Respawn Entertainment has successfully come out with their new third-person shooter game that is considered as a medium to large size. For everything to work smoothly during the release, their software tester needs to choose the best strategies to perform the software testing.

Figure Q4

- (i) Determine the strategy that is suitable to the Respawn Entertainment software tester and justify your answer.

(8 marks)

- (ii) List **TWO (2)** white box testing cases that can be performed based on the case study in **Figure Q4**.

(4 marks)

- (iii) List **TWO (2)** black box testing cases that can be performed based on the case study in **Figure Q4**.

(4 marks)

-END OF QUESTIONS -

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