



UTHM

Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2018/2019**

COURSE NAME : SOFTWARE ENGINEERING PRINCIPLES
COURSE CODE : BIE 10103
PROGRAMME CODE : BIP
EXAMINATION DATE : JUNE/ JULY 2019
DURATION : 3 HOURS
INSTRUCTION : ANSWER ALL QUESTIONS

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THIS QUESTION PAPER CONSISTS OF FIVE(5) PAGES

Q1 Answer Q1(a) to Q1(d) based on case study in Figure Q1.

In Murni Clinic, the patients are required to fill in their patient's information. Before receive any treatment from the doctor, new medical form will be created by the clinic assistant. After that, the form will be given to the doctor. During medical treatment, the doctor will write down the entire patient's treatment inside the form such as patient's medicines. After that, the doctor will give back the form to the assistant.

The assistants will handle all related payments with the patients. The assistant will give payment receipt, medicines or sick leaves to the patients as stated by the doctor inside the medical form. After payment being made, the patient's medical form will be put at a shelf. After that, the assistant will record the medicine sales and daily financial sales in a log book.

However, the current process causes several problems. That includes the difficulty to manage the entire patient's medical form if the numbers of patients keep increasing. Thus, to keep track or to search all the patient's medical records can be time consuming.

Therefore, Murni Clinic Management System is proposed to provide the users to manage all the information about the users, patients and inventories into a single system. Users have the ability to add, update, delete and view the information. Besides that, it provides two way communications between the doctor and the assistants. The assistants will provide the necessary patient's information to the doctor and the doctor will fill in the patient's condition and their medicine. After that, the doctor will send back the information to the assistants and they will provide the medicine including the patient's bills. In spite of this, the users must first log into the system in order to access the system but the doctor will have more privilege and grant access to a certain area and function of the system. With this system, the users are able to manage and organize all the information and improve the clinic management. The clinic also can have medicine sales and daily financial sales report from the system. Hopefully, Murni Clinic with the help of this system, all the information can be stored and managed efficiently and effectively in a single system.

The system will be developed using VB.net and Microsoft SQL Server 2014 for the database. It is expected to be completed within six months.

Figure Q1

- (a) Determine **FIVE (5)** main stakeholders. (5 marks)
- (b) Write **FIVE (5)** functional requirements. (5 marks)
- (c) Write **FIVE (5)** non- functional requirements. (5 marks)
- (d) Draw a use case diagram. (10 marks)

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- (e) Suggest **TWO (2)** conditions how stress testing can be done to Murni Clinic Management System. (5 marks)

Q2 (a) Describe a difference between design and requirement engineering. (4 marks)

- (b) Determine a suitable architecture style for a system that depend on the following non functional requirements:

(i) Security (2 marks)

(ii) Performance (2 marks)

(iii) Safety (2 marks)

(iv) Availability (2 marks)

(v) Maintainability (2 marks)

- (c) Design a layered architecture for the case study in **Figure Q2(c)**.

A landscape project management information system is to be developed to maintain information about landscape projects conducted by a company such as projects' activities, projects' workers, projects' progress, etc. It is intended that this will be updatable by staff working in the field using mobile devices as new activity information becomes available. The company has several existing databases that should be integrated through this system.

Figure Q2(c)

(6 marks)

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Q3 Answer **Q3(a)** to **Q3(e)** based on the code segment in **Figure Q3**.

```

Read A
IF A > 0 THEN
    IF A = 21 THEN
        Print "Key"
    ENDIF
ENDIF
    
```

Figure Q3

- (a) Derive a control flow graph. (10 marks)

- (b) Determine cyclomatic complexity. (2 marks)

- (c) List all independent paths. (3 marks)

- (d) List test case(s) needed to provide statement coverage. State the input for each test case. (5 marks)

- (e) List test case(s) needed to provide decision coverage. State the input for each test case. (5 marks)

Q4 Determine test conditions required for the following scenario using boundary analysis technique:

- (a) Password field which accepts minimum of 6 characters and maximum of 12 characters. (5 marks)

- (b) if a purchase is in the range of RM5 up to RM60 has no discounts, a purchase over \$60 and up to RM150 has a 5% discount, and purchases of RM151 and up to RM400 have a 10% discounts, and purchases of RM401 and above have a 15% discounts. (5 marks)

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Q5 (a) Determine type of testing of the scenario in **Figure Q5(a)**.

One test only for one component at a time. Finally one works up to the final design of the entire engine, to the necessary specifications.

Figure Q5(a)

(2 marks)

(b) Describe **TWO (2)** advantages of the answer in **Q7(a)**.

(4 marks)

(c) Describe **TWO (2)** disadvantages of the answer in **Q7(a)**.

(4 marks)

- END OF QUESTIONS -

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