Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2023/2024

COURSE NAME	:	SYSTEM ANALYSIS AND DESIGN
COURSE CODE	:	BIC 21003
PROGRAMME CODE	:	BIP / BIS / BIW / BIM
EXAMINATION DATE	:	JULY 2024
DURATION	:	3 HOURS
INSTRUCTIONS	:	1. ANSWER ALL QUESTIONS 2. THIS FINAL EXAMINATION IS CONDUCTED VIA ☐ Open book ☒ 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 **SIX (6)** PAGES.

ANSWER ALL QUESTIONS

Q1 Questions **Q1(a)** to **Q1(c)** are based on the case study in **Figure Q1.1**.

1. Introduction

1.1 Purpose
The purpose of the UTHM Complaint Management System is to streamline the process of submitting, tracking, and resolving complaints within the UTHM Residence College. It aims to facilitate effective communication among residence college and residence college staffs, ensuring timely and efficient resolution of various issues and concerns.

1.2 Scope
The system will provide a user-friendly interface for complaint submission and tracking, support multi-channel complaint submission, enable categorization of complaints, prioritize urgent complaints, provide real-time updates, offer comprehensive tracking and analytics capabilities, and include a feedback mechanism.

1.3 Overview
The Complaint Management System is designed to improve the overall living and learning environment within the UTHM Residence College by addressing and resolving complaints in a systematic and efficient manner.

2. General Description

2.1 Product Perspective
The Complaint Management System will function as an independent system within the UTHM Residence College's administrative framework, integrating seamlessly with existing communication channels and administrative processes.

2.2 Product Functions
- User-friendly complaint submission and tracking interface
- Support for multi-channel complaint submission including online portal, mobile application, and email
- Categorization of complaints into specific categories
- Priority-based handling of urgent complaints
- Automated notifications and real-time updates for stakeholders
- Comprehensive tracking and analytics capabilities
- Built-in feedback mechanism for users

2.3 User Characteristics
The users of the system include residence college, residence college administrative staff, and maintenance and security personnel.

Figure Q2.1

(a) Draw a context diagram.

(10 marks)

(b) Identify the data stores.

(5 marks)

(c) Identify the processes.

(5 marks)

Q2 Question **Q2(a)** and **Q2(b)** are based on the case study in **Figure Q2.1** and **Figure Q2.2** that shows an Entity Relationship Diagram (ERD) for the information system. However, the ERD contains a few errors.

A small-scale information system is required to manage staff-client information of a company. In addition to staff's information like the staff id, name, etc., we also need to record information about staff's department, where each of the staff is positioned in a department according to different specialization. The company also allocates mobile phones and laptops for sharing to certain staff to help with their business operations. Currently, the company is offering individual account and joint account to clients (e.g. for partners and spouse). To assist a client with any problems, issues, etc., each of them will be assigned to a dedicated staff. A client may open multiple accounts for different purposes.

Figure Q2.1

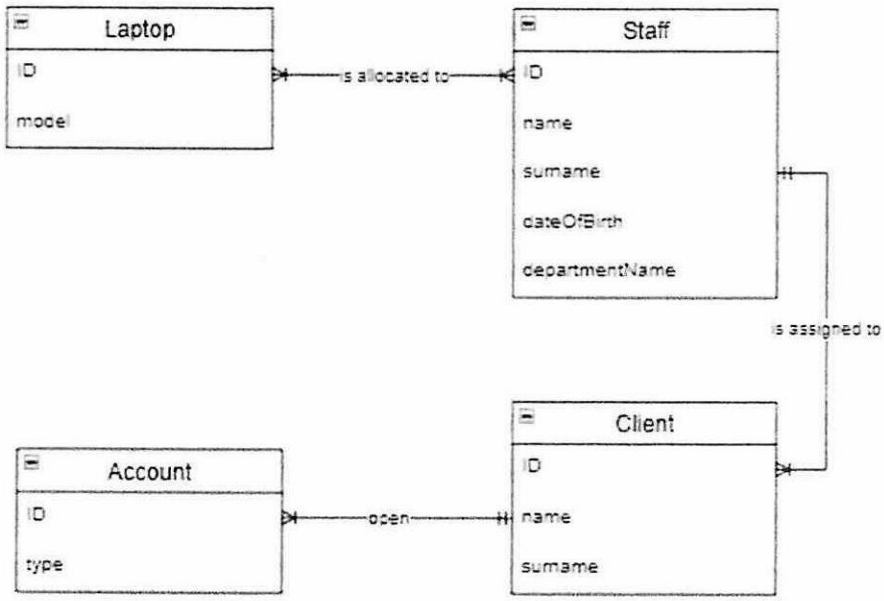

Figure Q2.2

(a) Provide **THREE (3)** corrections to the ERD. For each correction, give brief justification of why such correction is essential.

(3 marks)

(b) Redraw the ERD based on your answer in **Q2(a)**.

(3 marks)

Q3 Questions **Q3(a)** and **Q3(b)** are based on **Figure Q3.1** that shows a Data Flow Diagram (DFD) for a Car Rental System.

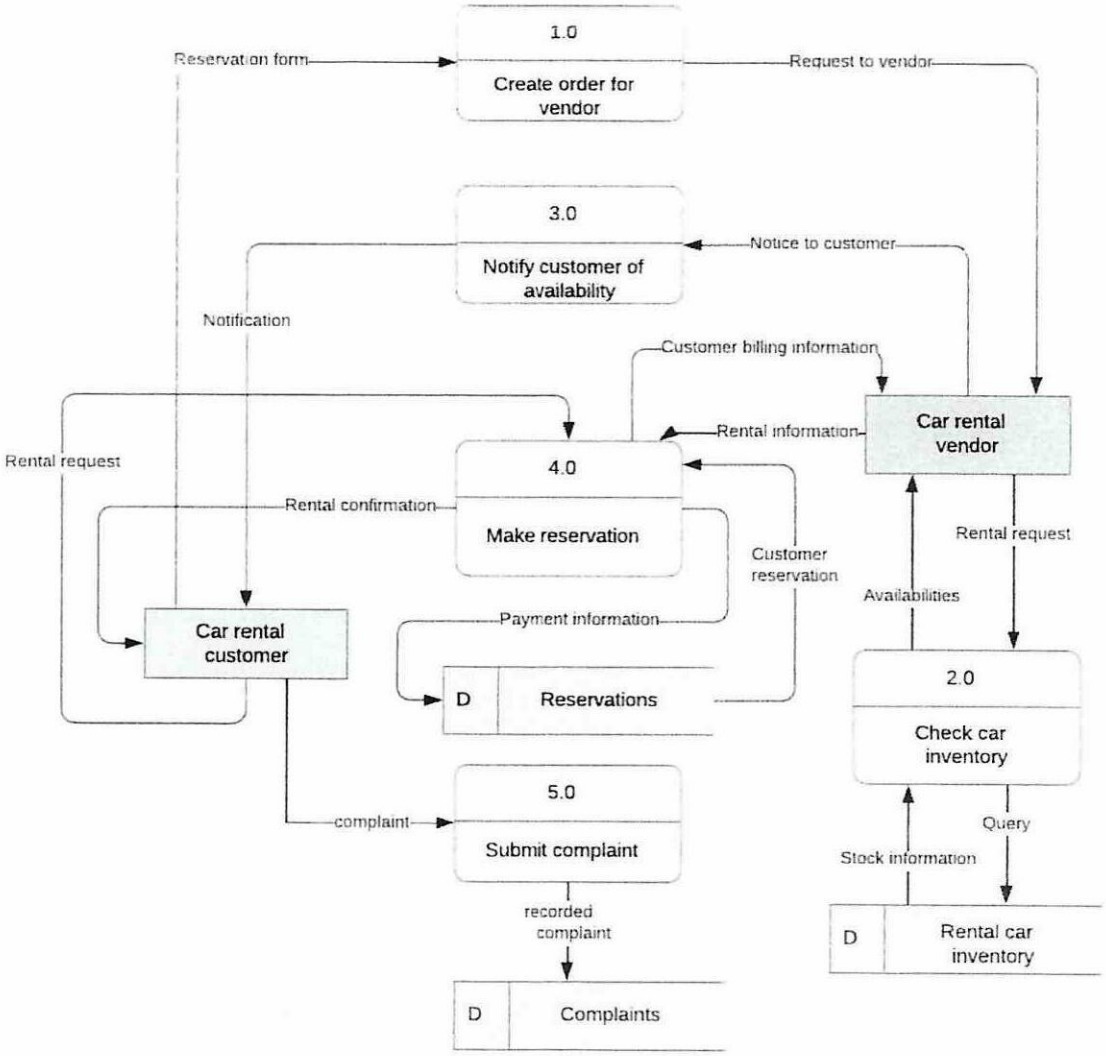

Figure Q3.1

(a) Construct the CRUD matrix. Hint: You do not have to specify the attributes in data entity.

(3 marks)

(b) Which of the data entity is probably not needed and can be dropped from the Entity Relationship Diagram of the system? Justify your answer.

(1 mark)

Q4 Based on the case study in **Figure Q4.1**, create an ERD for the reservation system. You must clearly identify the cardinality and modality on the relationships and specify the related primary key (PK) and foreign key (FK) in the entities. State any assumption you make on the ERD.

> Molek Travel operates a bus company that specializes in travelling along the beach roads in Terengganu. The main aim is to offer Terengganu's beautiful beaches scenic view to passengers and enable passengers to get quick stops at multiple view points along the selected route. For example, a passenger may choose available trip(s) between Dungun to Kuala Terengganu or any of the available trips.
>
> To improve customer experience with the company, a new passenger reservation system is to be developed. The system must be able to record and manage passenger reservation number, route or trip number, date, origin, destinations, departure time, arrival time, passenger name, and seat number and other necessary data. To use the system, customers are not required to register and login to the system.

Figure Q4.1

(10 marks)

Q5 Assume that you involve in the development of an online marketplace system, which is very much like Shopee and Lazada. Your target users include sellers and buyers from all around the world. As the appointed system analyst, one of your tasks is to gather all requirements from all stakeholders. Although functional requirements often define the system architecture, non-functional requirements are equally important.

(a) Discuss **FOUR (4)** security requirements that you must apply into the system with appropriate examples.

(12 marks)

(b) Describe **ONE (1)** example for each of the following non-functional requirements that you can propose to the development team.

(i) Multilingual

(ii) Making unstated norms explicit

(iii) Speed

(iv) Capacity

(v) Portability

(5 marks)

(c) Suggest **ONE (1)** architecture design that you can use for the system. Justify your answer.

(3 marks)

Q6 Questions **Q6(a)** to **Q6(c)** are based on the case study in **Figure Q6.1**.

Sunway Pyramid Mall is introducing an advanced parking system, allowing customers to conveniently pay parking fees, track payment history, and receive discounts through a dedicated mobile application. The system employs license plate recognition at parking entrances to record entry times. Customers must settle parking fees prior to exiting the mall. The key features of the system are:

- A camera captures customers' car plate numbers upon entry, automatically registering entry times.
- Customers use the app to pay parking fees, track payment history, and access discounts.
- Customers receive discount vouchers automatically applied during payment, encouraging repeat usage.
- Payment requires wallet top-up within the app, facilitating seamless transactions.
- Confirmation of payment and applicable discounts is displayed before exiting the parking area.
- Customers can view their recent visits to the mall within the app, enhancing transparency and record-keeping.

Figure Q6.1

(a) Produce a complete storyboard for the mobile application.

(8 marks)

(b) By applying principles of user interface design, draw an interface of parking payment system.

(8 marks)

(c) Identify **TWO (2)** possible foreign keys based on your answer in **Q6(b)**.

(4 marks)

- END OF QUESTIONS -