

KOLEJ UNIVERSITI TUNKU ABDUL RAHMAN  
FACULTY OF APPLIED SCIENCES AND COMPUTING

ACADEMIC YEAR 2015/2016

APRIL EXAMINATION

**AACS3013 DATABASE DEVELOPMENT AND APPLICATIONS**

WEDNESDAY, 6 APRIL 2016

TIME: 2.00 PM – 4.00 PM (2 HOURS)

DIPLOMA IN SCIENCE  
(COMPUTER SCIENCE AND STATISTICS, COMPUTER SCIENCE AND MANAGEMENT  
MATHEMATICS, COMPUTER SCIENCE AND COMPUTER MATHEMATICS, INFORMATION  
SYSTEMS ENGINEERING, BUSINESS INFORMATION SYSTEMS AND INTERNET  
TECHNOLOGY)

DIPLOMA IN INTERACTIVE SOFTWARE TECHNOLOGY

**Instructions to Candidates:**

Answer **ALL** questions. All questions carry equal marks.

**AACS3013 DATABASE DEVELOPMENT AND APPLICATIONS****Question 1**

- (a) Define the following terms in the context of database systems:
- (i) Data model (2 marks)
  - (ii) Entity (2 marks)
  - (iii) Relational database (3 marks)
- (b) The PATIENT\_DOCTOR relation shown below is susceptible to data anomalies.
- (i) Explain what insertion, modification and deletion anomalies are. (6 marks)
  - (ii) Provide an example for each anomaly based on the relation given below. (6 marks)

**PATIENT DOCTOR**

PatientID	Name	TelNo	DoctorCode	Specialization
P1001	Ali	09-1234557	D1	Surgery
P1002	Lim	04-4352345	D2	Emergency
P1003	John	06-7023815	D3	Consultant
P1004	Raju	05-6726817	D4	General
P1005	Mary	09-3691682	D2	Emergency

- (c) Briefly explain any **THREE (3)** types of databases with reference to the number of supported users. (6 marks)
- [Total: 25 marks]

**Question 2**

- (a) Explain the features of Primary Key and Candidate Key with an example. (7 marks)
- (b) Consider the following narrative of an online movie subscription company.

Movie Flix Sdn. Bhd. is a new start-up company that provides online movie subscription with different subscription packages. The company offers two categories of subscription packages. The attributes in the CATEGORY relation include CategoryID, Category\_Type and Price. Movie Flix has a database to maintain the scheduled movies which are shown on specific date and time. The attributes of MOVIE\_SCHEDULE are Schedule\_No, Movie\_Title, Movie\_Date, Movie\_Time. Every customer is allowed to watch the movie(s) available in the category subscribed. A customer can have many subscriptions and a category can appear in many subscriptions. The attributes of SUBSCRIBE are Subscribe\_No and Description. The attributes in the CUSTOMER relation include Customer\_ID, Customer\_Name, Customer\_IC, Customer\_Contact\_No and Address.

- (i) Draw an Entity-Relationship Diagram (ERD) to illustrate the scenario narrated using Crow's Foot notation. Resolve any many-to-many relationship. (7 marks)

**AACS3013 DATABASE DEVELOPMENT AND APPLICATIONS****Q2.(b) (Continued)**

- (ii) For each of the entities in the Entity Relationship Diagram (ERD) drawn in Q2 (b) (i), list all the relevant attributes using the Database Design Language (DBDL) format. In the list, show all the primary keys and foreign keys (if any) clearly. Underline all primary keys and indicate the foreign keys with an asterisk (\*).

(11 marks)


[Total: 25 marks]

**Question 3**

- (a) Define business rule and describe any **FOUR (4)** importance of specifying business rules in an organization. (8 marks)
- (b) Explain conceptual data model and identify **TWO (2)** tools for producing the model. (5 marks)
- (c) Consider the following book orders based on different courses.

**BOOK ORDER**

<b>BookID</b>	<b>Book_Title</b>	<b>Book_Category</b>	<b>PublisherID</b>	<b>Publisher Name</b>	<b>FacultyID</b>	<b>Faculty_Name</b>	<b>Quantity</b>
BN101	Oracle	Database	P11	Wrox	F001	Multimedia Technology	100
BN101	Oracle	Database	P11	Wrox	F002	Computer Science	70
BN102	Financial report	Finance	P12	Prentice	F101	Business & Finance	90
BN103	Rich dad	Finance	P13	Pearson	F101	Business & Finance	80



Repeating Groups

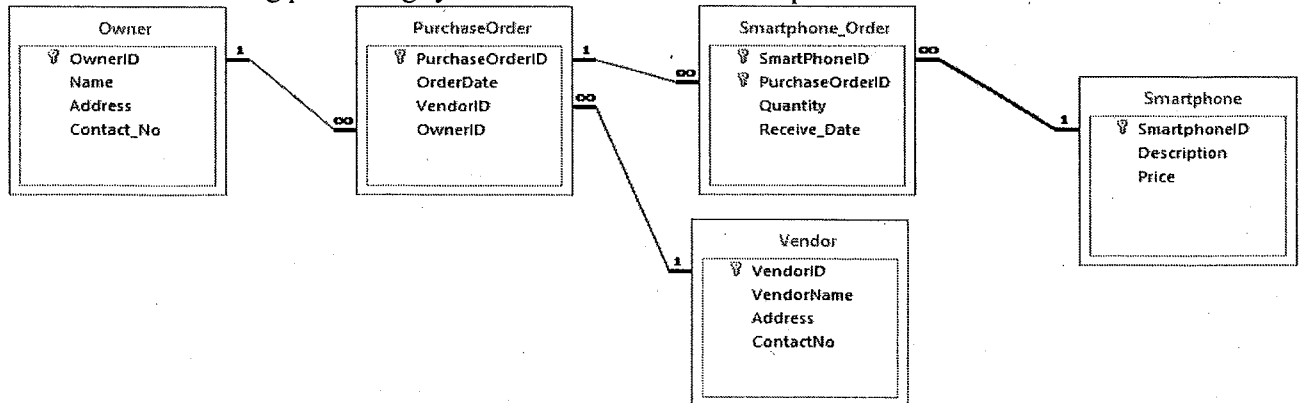
Normalize the table to a set of Third Normal Form (3NF). Your answer should show all three stages of normalization (1NF, 2NF and 3NF) of the normalization process by using the Database Design Language (DBDL) format.

(12 marks)

[Total: 25 marks]

**AACS3013 DATABASE DEVELOPMENT AND APPLICATIONS****Question 4**

Consider the following purchasing system of a mobile devices shop.



**Important Note:** You are required to use the aliases for the tables provided as follows:

Alias	For table
o	Owner
p	PurchaseOrder
s	Smartphone
t	Smartphone_Order
v	Vendor

- (a) Write the appropriate Data Definition Language (DDL) commands to create the "PurchaseOrder" and "Smartphone\_Order" table with appropriate data types. (7 marks)
- (b) Write the appropriate Structured Query Language (SQL) statement for the following queries. The query result(s) should **show meaningful information**.
- Display the owner's details who processed transaction PurchaseOrderID, 'P101'. (3 marks)
  - Display the vendor who will receive the smartphones order on the date '08-AUG-2016'. (Note: Date format – 'DD-MMM-YYY', e.g. '18-JAN-2016') (4 marks)
  - The smartphone models with SmartphonelD 'P500' and 'K800' are out of stock and obsolete. Remove them from the database. (3 marks)
  - The owner would like to change the quantity ordered for the smartphone model with the SmartphonelD 'A888' to 100 units. (3 marks)
  - The iPhone 6S model smartphone is very popular now. The owner decided to insert this smartphone model into the smartphone table by defining the SmartphonelD to 'I006', described as 'iPhone 6S model' and the price is four thousand ringgit. (2 marks)
  - Add another new Samsung smartphone with the model 'SS7', described as 'Samsung Galaxy S7 edge' and the price is yet to be determined. (2 marks)
  - Undo the transaction executed. (1 mark)

[Total: 25 marks]