UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2018/2019

COURSE NAME	:	DATABASE SYSTEM
COURSE CODE	:	BIC 21404
PROGRAMME CODE	:	BIW/BIS/BIP/BIM
EXAMINATION DATE	:	JUNE / JULY 2019
DURATION	:	3 HOURS
INSTRUCTION	:	A) ANSWER **ALL** QUESTIONS
		B) PLEASE WRITE YOUR ANSWER IN THIS QUESTION BOOKLET

THIS QUESTION PAPER CONSISTS OF **TWELVE (12)** PAGES

Q1   (a)   List **FIVE (5)** sources of business rules.

(5 marks)

Answer:

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```

(b)   Based on **Figure Q1(b)**, describe **TWO (2)** business rules that governs the relationship between CLASS, ENROLL and STUDENTS.
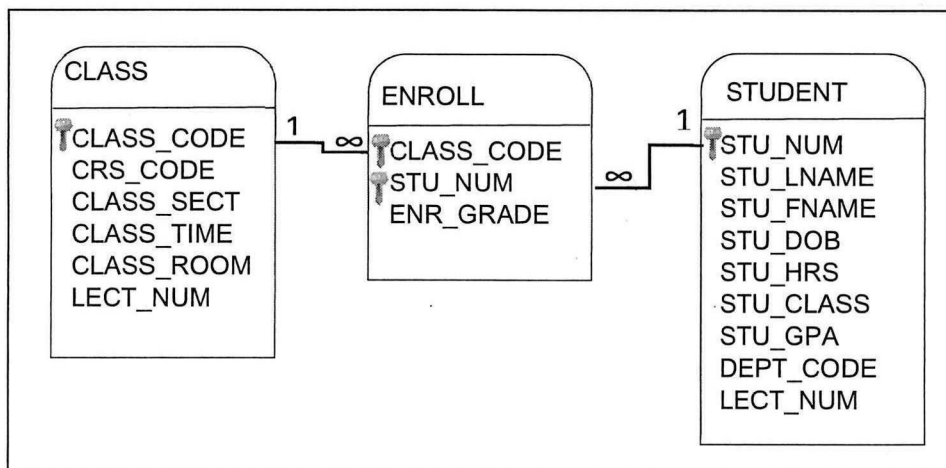
(5 marks)

Figure Q1(b)

Answer:

```

```

Q2 You are decided the effort in setting up a simple CD database for Company A. Two tables are needed, one for recording the basic details of each album and one for recording the details of each track on the album. The details information for each table is as below.

Albums table in **Table Q2(a)(i)** with one row for each CD, containing the following columns:

Table Q2(a)(i)

Column name	Datatype	Purpose
AlbumCode	char(12)	A unique code for each CD, assigned by the record company, e.g. "CDCBS25314".
Performer	varchar(60)	The name of the single artist or group.
AlbumTitle	varchar(60)	The name of the CD.
ShelfNumber	numeric(2)	The number of the Triple-R shelf where the CD is stored.
YearReleased	numeric(4)	The year when the album was first available.
RecordCompanyCode	char(6)	A code that identifies the record company that released the CD, e.g. "CBS", "Sony".

Tracks table in **Table Q2(a)(ii)** has one row for each track on a CD, e.g. a 10-track CD will have 10 rows in this table. It has the following columns:

Table Q2(a)(ii)

Column name	Datatype	Purpose
AlbumCode	char(12)	A unique code for each CD, assigned by the record company, e.g. "CDCBS25314".
TrackNumber	numeric(2)	The sequence number for each track, i.e. 1, 2, 3, …
TrackTitle	varchar(60)	The name of the track.
TrackLength	numeric(4)	The playing time of the track (in seconds).

(a)   Write an SQL "create table" statement for the Tracks table, using datatypes based on the given example data, including primary key and foreign key clauses, where appropriate.

(3 marks)

Answer:

```
```

(b) Using a single SQL statement, insert two rows of data into table Albums. The data can be any.

(3 marks)

Answer:

```
```

(c) List the title of the track, and the name of the performer, where the title contains the character string "sun" anywhere within it.

(3 marks)

Answer:

```
```

(d)   For each performer with more than one album, display the performer's name and the total number of albums by that performer, in descending order of the total number of albums.

(4 marks)

Answer:

(e)   For each album, display the album code, album title and the total number of tracks on that album, in descending order of the total number of tracks.

(4 marks)

Answer:

Q3   (a)   Define policies and standards in regards to a Database Administrator's role.

(2 marks)

Answer:

(b)   State **ONE (1)** example of a policy and a procedure related to database administration.

(2 marks)

Answer:

(c)   List **THREE (3)** services that can be provided by the cloud services partner companies.

(3 marks)

Answer:

(d)   Describe any **ONE (1)** service stated in **Q3(c)**.

(3 marks)

Answer:

Q4   (a)   Consider the STUDENTS relation of the children in a class and pets they have as shown in **Figure Q4(a)**. Convert the relation into a set of 1NF, 2NF, 3NF and BCNF relations. Show the keys (primary key and foreign key) in resulting relations clearly.

```
                      TABLE: STUDENTS
        | Name       | Age | Pet | Pet_Name |
        ---------------------------------------
        | Hussein    | 10  | Dog | Wati     |
        ---------------------------------------
        | Khuda      | 10  | Cat | KakLimah |
        ---------------------------------------
        | Yeh        | 11  | Dog | Lavida   |
        ---------------------------------------
        | Ariffin    | 10  | Cat | Wani     |
        ---------------------------------------
```

Figure Q4(a)

(15 marks)

Answer:

(b)   Consider the following relation schema and the functional dependencies:

```
CAR-SALE (Car#, Date-sold, Salesman#, Commission,
          Discount)
Primary key:Car#, Salesman#
Functional dependencies:
(fd1) Salesman# → Commission
(fd2)Date-sold → Discount
```

(i)   Is the given relation schema in 1NF? Explain your answer.

(2 marks)

Answer:

(ii)   Is the given relation schema in 2NF? Explain your answer.

(5 marks)

Answer:

(iii)   Transform **Q4(b)(ii)** it into a set of relation schemas such that each resulting relation schema is in 3NF.

(8 marks)

Answer:

Q5   Answer **Q5 (a)** – **Q5 (c)** based on **Figure Q5**.

The organizers of the SCDM2020 international conference need to keep
track of a large collection of workshops associated with the event.
Initial requirements analysis brings out the following information
needs to be recorded.
- Each workshop has a name, and happens on a particular date —
  or dates, as some workshops last more than one day.
- There are several participants, each of which may sign up to
  one or more workshops.
- For each participant, record their name, email address, and
  the workshops which they wish to attend.
- There are a number of meeting rooms at the conference venue,
  each of a fixed capacity. Meetings rooms are identified by a
  floor and room number.
- Every workshop needs an allocated meeting room; where a
  workshop lasts for two days, it will use the same room on both
  days.

Figure Q5

(a)   Draw an entity-relationship diagram (ERD) which represents information

in **Figure Q5**.

(7 marks)

Answer:

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(b)   Describe each of the following concepts, and give an example from ERD produced in   **Q5(a)**.

(i)   Key

(4 marks)

Answer:

(ii)   Composite key

(4 marks)

Answer:

(c)   Explain how total participation and key constraints are exposed in an ERD in **Q5(a)**.

(5 marks)

Q6   Answer **Q6(a) – Q6(c)** based on the following scenario.

> Hussein would like to implement the Clinical Patient Appointment database system via Internet.

(a)   Draw a 3-Tier architecture distributed database management system (DDBMS).

(5 marks)

Answer:

```
```

(b)   Based on the scenario in **Q6(a)**, suggest one Web-based Programming language can be used to connect the database server.

(2 marks)

Answer:

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```

(c)   Describe **THREE (3)** potential problems that caused Akmal fail in filling up online appointment form.

(3 marks)

Answer:

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- END OF QUESTION-

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