

<b>Student Number:</b>	<b>Seat Number:</b>
<b>Student Name:</b>	<b>Module Group:</b>



## Databases

Year 1 Semester 2

### SCHOOL OF INFOCOMM TECHNOLOGY

Diploma in Information Technology

Diploma in Data Science

Diploma in Cybersecurity & Digital Forensics

### **Common Test (OPEN BOOK)**

(20% of Module Assessment)

## Revision Paper

Date of TEST : 15 Dec 2021

Time of TEST : 11am to 12 noon

Note 1: This is a 1-hour paper.

(Note 2: The Date & Time reflected above is for the ACTUAL TEST.  
Your tutor will inform you if there are any changes to the date/time).

#### INSTRUCTIONS TO CANDIDATES:

1. Write your Student Number, Name, Module Group and Seat Number CLEARLY in the boxes provided above.
2. This paper consists of **10** pages including this cover page. Check carefully to make sure your set is complete.
3. Answer **ALL** questions in the spaces provided.
4. There is one appendix attached as:  
**Appendix 1: 'Pilot of the Airwaves' Case Scenario** for Questions 1 & 2.
5. **DO NOT** detach any pages from this booklet.
6. This is an open book test. **NO** electronic devices and programmable calculators are permitted.

Grade	
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**QUESTION 1: 50 marks**

In the context of Relational Theory, answer the following questions with reference to the ‘Pilot of the Airwaves’ case scenario given in Appendix 1.

- (a)    (i)    For the DiscJockey relation, suggest its list of candidate keys and rank them in the order of suitability as primary key.

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- (ii)    What do you understand by the term ‘null’? What happens if a new disc jockey, May Lim is given ‘null’ as her DjId?

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- (iii)    The primary key for DiscJockeyRoster relation is given as a composite key of ProgrammeNo and DjId. Is this necessary? Explain why? Can DjId on its own be the primary key?

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- (iv) What you understand by the term 'degree of a relation'? Give the degree of ProgrammeSchedule.

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- (v) What do you understand by the term 'domain'? Give the domain of the attribute ScheduledTime.

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(17 marks)

- (b) Identify the types of violation on relational integrity arising from the following actions. For each violation, explain how it occurs. You are **NOT** required to write any SQL statements.

- (i) Insert the following tuple into the DiscJockeyRoster relation.

<i>&lt;ProgrammeNo&gt;</i>	<i>&lt;DjId&gt;</i>	<i>Role</i>
Pg05	Dj005	Lead presenter

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(ii) Delete the following tuple from the Song relation.

<i><b>SongId</b></i>	<i><b>Title</b></i>	<i><b>Artist</b></i>	<i><b>Duration (min)</b></i>	<i><b>Genre</b></i>
So001	Piloting the Airwaves	Charles Bore	3:40	Pop

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(iii) Insert the following tuple into Playlist Relation.

<i><b>&lt;ProgrammeNo&gt;</b></i>	<i><b>&lt;SongId&gt;</b></i>	<i><b>SequenceNo</b></i>	<i><b>ScheduledTime</b></i>
Pg01	Jo001	3	0927

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(21 marks)

(c) For each of the following statements, state True or False and briefly explain why it is so.

- (i) A song is sung by two singers. It is possible to have a second attribute named 'Artist' so that the names of both singers can be stored in the two Artist attributes in Song relation.

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- (ii) Some of the programmes have quiz questions. Listeners can call in to answer them and win a prize. In order to keep track of the winners and prizes, a new relation called PrizeWinner is required.

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- (iii) A new channel is introduced to play classical music. The existing tables will be sufficient to hold the data requirement of this new channel.

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(12 marks)



- b. The room which channel “Double Three” normally uses to air its programmes is being renovated. The channel is now moved to room B02-33. Write the SQL code to reflect this change in the database.

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(10 marks)

- c. Write the SQL code to list the details of all programmes that are scheduled to be aired in August 2009. Display the list according to the alphabetical order of the programme titles. You are required to provide 2 versions, one using DATE function and one without the use of DATE function.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

(10 marks)



- d. The programme director wants to know which female disc jockey has a role as a 'Lead presenter'. Write the SQL code to list the details of these disc jockeys together with their programme numbers.

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(10 marks)

- e. A new disc jockey, Irine Soh (ID = 'Dj006'), has been hired to anchor a new Mandarin channel called "Nine Three Hundred" (ID = '9300') which will be launched soon. It will be using room B02-03 to air its programmes. Write the SQL code to include this new information in the database.

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(10 marks)

## **Appendix 1: 'Pilots of the Airwave' Case Scenario**

'Pilots of the Airwave' is an application package that has been developed by ApeX Software House to allow disc jockeys of its clients to be creative in making their programmes interesting and engaging. It has a huge collection of songs licensed from the various major music publishers together with jingles from advertisers. It allows the capturing and updating of information about the disc jockeys and scheduling of programme sessions.

A programme director will start scheduling the programmes months ahead before rostering disc jockeys for the programmes. Each programme may be hosted by one or more disc jockeys. Each disc jockey may host many programmes. These disc jockeys, working for the different channels, will then plan two weeks in advance the playlists of what songs to be played during the programmes they host. They will be told what jingles to play for advertisers. Broadcasting and recording for each channel are done in the same sound room and there is no sharing of sound rooms.

During the programme, the songs are played in the sequence given and the time scheduled in the playlist. However, the disc jockeys can override this sequence and timing on a need basis. When an override is used, the playlist will be updated to reflect what is actually played in a particular session. The playlists will then be used for auditing purpose and to adjust payment of royalties to the copyright owners of the songs.

Having this new system has brought about many benefits for everyone. One benefit the disc jockeys can enjoy is that they can plan the time for the songs, the jingles and the talk time, allowing for the news reading and the traffic conditions reporting. Another benefit is that they may even make sure that a particular song is not played more than a certain number of times within a period of time. Moreover, the automatic play feature of a playlist is particularly useful when there is only jockey on duty and there is a need for a rest break.

The following relations contain complete list of test data for the system.

### **DiscJockey Relation**

<b><i>DjId</i></b>	<b><i>Name</i></b>	<b><i>Gender</i></b>	<b><i>&lt;ChannelId&gt;</i></b>	<b><i>PetName</i></b>
Dj001	Jaramie Lee	Female	9033	JL
Dj002	Alvin Toh	Male	9033	Chipmunk
Dj003	Horace Png	Male	9500	Hooray
Dj004	Jerald See	Male	9500	I see
Dj005	Michelle Cheng	Female	9500	Meshare

### **Channel Relation**

<b><i>ChannelId</i></b>	<b><i>Channel name</i></b>	<b><i>Language</i></b>	<b><i>RoomLocation</i></b>
9033	Double Three	English	B01-33
9500	95 Oldies	English	B01-05
9333	Three Tree	Mandarin	B01-13

(Continued on next page...)

**Appendix 1: 'Pilots of the Airwaves' Case Scenario (Con'td)****Song Relation**

<b><i>SongId</i></b>	<b><i>Title</i></b>	<b><i>Artist</i></b>	<b><i>Duration (min)</i></b>	<b><i>Genre</i></b>
So001	Piloting the Airwaves	Charles Bore	3:40	Pop
So002	More changes	Blue or Black	4:20	Soft Rock
So003	My way to heaven	Led Astray	7:20	Heavy metal
So004	Land of Confusion	Superman	3:30	Soft Rock
Jo001	Cool Consulate	Advertisement	0:25	Jingle
Jo002	Wonderful world	Advertisement	0:30	Jingle
So005	Drunk with Love	Which Dion	4:06	Pop
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**ProgrammeSchedule Relation**

<b><i>ProgrammeNo</i></b>	<b><i>PDate</i></b>	<b><i>PTime</i></b>	<b><i>Title</i></b>
Pg01	04/08/09	0900-1100	Good Morning Singapore
Pg02	04/08/09	2200-2400	Take it Easy
Pg03	05/08/09	1100-1400	Midday cruising
Pg04	08/08/09	1400-1700	Lazy Friday Afternoon
Pg06	11/08/09	0900-1100	Good Morning Singapore

**Playlist Relation**

<b><i>&lt;ProgrammeNo&gt;</i></b>	<b><i>SequenceNo</i></b>	<b><i>&lt;SongId&gt;</i></b>	<b><i>ScheduledTime</i></b>
Pg01	1	So002	0910
Pg01	2	Jo001	0915
Pg01	3	So001	0920
Pg02	2	So001	2210
Pg03	5	So003	1200
Pg04	4	So005	1420

**DiscJockeyRoster Relation**

<b><i>&lt;ProgrammeNo&gt;</i></b>	<b><i>&lt;DjId&gt;</i></b>	<b><i>Role</i></b>
Pg01	Dj001	Lead presenter
Pg01	Dj002	Assistant presenter
Pg02	Dj003	Co-presenter
Pg02	Dj004	Co-presenter
Pg01	Dj004	Assistant presenter

**Important Notes:**

1. Character and Date columns are left-justified.
2. Integer and numeric columns are right-justified.
3. Date values are in 'DD/MM/YYYY' format.
4. Tables with the last row showing "..." indicates that there are more data rows which are not shown.