Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2021/2022

COURSE NAME	:	DATABASE
COURSE CODE	:	BIC 21404
PROGRAMME CODE	:	BIS / BIP / BIW / BIM
EXAMINATION DATE	:	JULY 2022
DURATION	:	3 HOURS
INSTRUCTION	:	1. ANSWER ALL QUESTIONS
		2. THIS FINAL EXAMINATION IS AN **ONLINE** ASSESSMENT AND CONDUCTED VIA **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

Q1 Answer **Q1(a)** and **Q1(b)** based in **Figure Q1**.

University ABC has already been on online learning since 2020, as the whole world still facing with the pandemic. For online learning, the university needs to keep details of its students and lecturers.

The student information is recorded during registration, and they are including with the student Matric No, date, program and year of registration. While for each student, they are allocated with one academic advisor to help and guide them during the 4 years study in the university.

For each of the student too, is allocated with different lecturer based on the subjects they have registered and the lecturer are allocated based on the campus the students registering. For each program have the subject code that students will enrolled too and the maximum credit hour they allow for registering in one semester is 20 credits, and total of 140 credits for the whole of their degree program.

FIGURE Q1

(a) Describe the design process to build and validate logical data model.

(5 marks)

(b) List the number of entity(es) and **ONE (1)** possible constraint that involved in the case study.

(5 marks)

Q2 Answer **Q2(a)** and **Q2(b)** based on Table 1, Table 2, Table 3 and Table 4.

TABLE 1: COMPETITORS table

CompetitorNum	GivenName	Familyname	Gender	Dataofbirth	CountryCode
20210001	Cesar	Cielo	male	1990-09-23	BRA
20210002	Kazuya	Kaneda	male	1990-11-05	JPN
20210003	Julia	Hassler	female	1993-02-27	ALB
⋮	⋮	⋮	⋮	⋮	⋮
20210577	Yury	Suvorau	male	1994-03-31	ALG
20210578	Shannon	Vreeland	female	1991-11-15	USA

TABLE 2: COUNTRIES table

CountryCode	CountryName
AFG	Afghanistan
ALB	Albania
ALG	Algera
⋮	⋮
ZAM	Zambia
ZIM	Zimbabwe

TABLE 3: EVENTS table

EventId	Gender	Distance	Style	Date	StartTime
SWM001	men	100	backstroke	2021-07-25	20:11.00
SWM001	women	100	backstroke	2021-07-26	22:11.00
SWM014	women	400	butterfly	2021-07-27	22:11.00
⋮	⋮	⋮	⋮	⋮	⋮
SWM031	men	200	freestyle	2021-07-30	19:43.00
SWM044	women	400	freestyle	2021-07-30	21:00.00

TABLE 4: RESULTS table

EventId	CompetitorNum	Place	Lane	Time	Note
SWM001	20210001	1	8	46:91.00	World Record
SWM001	20210002	7	4	50:99.12	
⋮	⋮	⋮	⋮	⋮	⋮
SWM044	20210003	5	6	4:06.46	
SWM044	20210578	3	5	4:04.46	

(a) Examine and write the correct syntax for each of the following Structured Query Language (SQL) statement.

(i)
```
Select count(GivenName), min(GivenName), max(GivenName),
avg(GivenName), sum(GivenName) from  COMPETITORS;
```

(3 marks)

(ii)
```
SELECT * from EVENTS where Gender = WOMEN;
```

(3 marks)

(iii)
```
Select  Cp.GivenName, Cy.CountryCode from COMPETITOR
Cx natural join COUNTRIES Cy;
```

(3 marks)

(iv)
```
Select  max(count(*))from  Competitors  group  by
CountryCode;
```

(2 marks)

(b) Write Structured Query Language (SQL).

(i) Create a query that displays result to only those people who were in more than two events.

(2 marks)

(ii) Create a query that displays all given name which have the letter of "u" in the second position, regardless of all other characters.

(3 marks)

(iii) Create a query that displays data of birth, family name and competitor number for all pairs of competitors who have the same date of birth.

(4 marks)

(iv) Create a query that displays the name of each competitor and the total number of events that the competitor was in.

(4 marks)

Q3 (a) Draw the relationship for **Q3(a)(i) and Q3(a)(ii)**.

(i) An employee has only one parking space, and special parking space is assigned to an employee.

(2 marks)

(ii) A movie theatre can show many different movies, and one movie can be shown in many movie theatres.

(2 marks)

(b) (i) What is the purpose of a composite entity?

(2 marks)

(ii) Explain how do you know whether you need composite entity in Entity Relationship Diagram (ERD) and give **ONE (1)** example of composite entity.

(2 marks)

(c) Draw a complete Entity Relationship Diagram (ERD) based on Figure **Q3(c)**.

```
Balloon and Bouquet Surprise Shop want to develop
system that help them in organize and managing their
business and record. This system is supposed to help
customer booking their gift online. Customer can book
one gift at one time as this give is special for each
receiver.  Customer can upgrade their gifts with
additional service for example special card, wrapped
or adding luxury decoration. Lastly, this system can
handle payment made by customer to the company.
```

FIGURE Q3(c)

(12 marks)

Q4 Answer **Q4(a) – Q4(c)** based on the **Table 1**.

TABLE 1: Table Academic Advisor

StudentID	StudentName	SubjectCode	SubjectDesc	SubjectMark
AT00123	Kamal	BIT10303	Intro IT	80
		BIT10302	Ethics	56
CT00456	Sudin	BIT10303	Intro IT	80
		EHE10102	Basic English	78
AT00111	Jamaliah	BPK10102	Entrepreneurship	92

TABLE 1: (continued)

SubjectGred	StaffId	StaffName	StaffSalary	StaffFaculty
A-	2011	Dr Alina	4500.00	FSKTM
C	1012	En Ahmad	4000.00	FSKTM
A-	2011	Dr Alina	4500.00	FSKTM
B+	4023	Dr Tony	5000.00	PPUK
A	977	Dr Razak	5100.00	PPZ

(a) Discuss on deletion anomalies when staff want to delete `Sudin`.

(2 marks)

(b) Describe the consequences if the information in **Table 1** will be store in database.

(2 marks)

(c) Show the normalization process from First Normal Form (1NF) to Third Normal Form (3NF).

(16 marks)

(d) Draw the Entity Relationship Diagram (ERD) after the normalization process.

(4 marks)

Q5 (a) State **FOUR (4)** requirements for the web and database management system integration.

(8 marks)

(b) Draw a common architecture for integrating the web and database management systems.

(8 marks)

(c) Describe the following in the perspective of database system.

(i) Online Analytical Processing (OLAP)

(3 marks)

(ii) Data mining.

(3 marks)

- END OF QUESTIONS -