



**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
SEMESTER II  
SESSION 2021/2022**

- COURSE NAME : DATABASE SYSTEM
- COURSE CODE : BIT 20803
- PROGRAMME CODE : BIT
- 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

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**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)**.

Cemerlang College wants their Information Technology Department to develop sport equipment rental system. With this system, they want student to be able to rent sport equipment online. Student can rent at least 1 equipment and maximum 2 equipment per rental for example ball, racquet and others. Each equipment has its own categories for example aqua sport, field and track, court sport and others. Each rental has RM 50 deposit and will be returned upon returning the sport equipment. Admin can manage the sport equipment data and all rental data.

**FIGURE Q3(c)**

(12 marks)

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

**TABLE 1: Table Academic Advisor**

Student ID	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

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

**TABLE 1: (continued)**

- (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 -**

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