SECTION A: 60 MARKS

BAHAGIAN A: 60 MARKAH

INSTRUCTION:

This section consists of **TWO (2)** subjective questions. Answer **ALL** questions.

ARAHAN:

*Bahagian ini mengandungi **DUA (2)** soalan subjektif. Jawab **SEMUA** soalan.*

QUESTION 1

SOALAN 1

CLO1
C3

(a) Based on Relational Model Scheme below, write **ONE (1)** suggestion of Super Key, Candidate Key, Primary Key, Alternate Key and Foreign Key for DOCTOR entity by completing the **Table A1(a)**.

*Berdasarkan Skema Model Hubungan di bawah, tulis **SATU (1)** cadangan Kunci Raya, Kunci Peserta, Kunci Primer, Kunci Pilihan dan Kunci Asing untuk entiti DOCTOR dengan melengkapkan **Jadual A1(a)**.*

DOCTOR (DocID, DocName, Gender, Salary, Email, DeptID)

DEPARTMENT (DeptID, DeptName, Phone)

Table A1(a) / *Jadual A1(a)*

Key Type	Example
1. Super Key / *Kunci Raya*	
2. Candidate Key / *Kunci Peserta*	
3. Primary Key / *Kunci Primer*	
4. Alternate Key / *Kunci Pilihan*	
5. Foreign Key / *Kunci Asing*	

[10 marks]

[*10 markah*]

Question (b) and (c) are based on the following Relational Data Model for Ombak Hospital Management System.

Soalan (b) dan (c) berikut adalah berdasarkan Model Data Hubungan untuk Sistem Pengurusan Hospital Ombak.

DOCTOR

DocID	DocName	Gender	Salary	Email	DeptID
D201	Sarah Ali	F	7500	sarah.a@doc.my	ANA
D511	Ahmad Naqeeb	M	11000	a.naqeeb@doc.my	FME
D123	David Lee	M	5000	davidlee@doc.my	PED
D321	Gururani	F	7500	guru@doc.my	SUR

DEPARTMENT

DeptID	DeptName	Phone
ANA	Anesthesiology	09-8591495
FME	Family medicine	09-8591423
PED	Pediatrics	09-8591460
SUR	Surgery	09-8591477

PATIENT

PatID	PatName	Gender	Ward	DocID	DisCode
P001	Zaharah	F	Seroja 1	D511	DCF
P002	Mohd Abu	M	Melati 2	D201	DCF
P003	Zakaria	M	Melati 3	D321	DCF
P004	Cecilia	F	Seroja 1	D511	DCB
P005	Raju	M	Kenanga 1	D321	DCC

DISEASE

DisCode	DisName	Med1	Med2
DCF	FLU	Zanamivir	Peramivir
DCC	CHOLERA	Co-trimoxazole	Tetracycline
DCB	BRONCHITIS	Cough Syrup	Paracetamol tabs
DCP	PNEUMONIA	Penicillin Syrup	Amoxycillin Syrup

Figure A1(b): Ombak Hospital Management System

Rajah A1(b): Sistem Pengurusan Hospital Ombak

CLO1 C3 (b) Identify the entities and relationship for the above situation.
Kenalpasti entiti dan hubungan bagi situasi di atas.

[10 marks]
[*10 markah*]

CLO1 C3 (c) Draw a complete Entity Relationship Diagram (ERD) to represent your answer in **Question 1(b)**.
*Lukiskan Rajah Hubungan Entiti (ERD) yang lengkap bagi mewakili jawapan anda pada **Soalan 1(b)**.*

[10 marks]
[*10 markah*]

QUESTION 2
SOALAN 2

By referring to Relational Model Scheme below;
Dengan berpandukan Skema Model Hubungan di bawah;

STUDENT (RegistrationNo, StudName, ICNo, Class, CGPA)
COURSE (CourseCode, CourseName, Credit)
REGISTER (RegistrationNo, CourseCode)

Figure A2: Relational Model Scheme for Course Registration System
Rajah A2: Skema Model Hubungan bagi Sistem Pendaftaran Kursus

CLO1 C3 (a) Draw an Entity Relationship Diagram (ERD) to represent the Course Registration System.
Lukis Rajah Hubungan Entiti (ERD) bagi mewakilkan Sistem Pendaftaran Kursus.

[10 marks]
[*10 markah*]

CLO1 C3

(b) Write the SQL command to create the table structure for a table named STUDENT. The basic table structure is summarized in **Table A2(b)**.

*Tuliskan arahan SQL bagi membentuk struktur jadual bernama STUDENT. Struktur asas jadual diringkaskan dalam **Jadual A2(b)**.*

Table A2(b) / *Jadual A2(b)*

RegistrationNo	VARCHAR(12)
StudName	VARCHAR(30)
ICNo	VARCHAR(14)
Class	VARCHAR(5)
CGPA	DECIMAL (3,2)

[10 marks]

[*10 markah*]

CLO1 C3

(c) By applying Structured Query Language to the Course Registration System, write **THREE (3)** commands to list all students from Class DTK4A, all courses that the Course Name starts with "Comp" and also students name and courses name lists for those who have registered.

*Dengan mengaplikasikan Bahasa Pertanyaan Berstruktur kepada Sistem Pendaftaran Kursus, tuliskan **TIGA (3)** arahan bagi menyenaraikan semua pelajar daripada Kelas DTK4A, semua kursus yang mana Nama Kursus bermula dengan "Comp" dan juga senarai Nama Pelajar dan Nama Kursus untuk pelajar yang telah mendaftar.*

[10 marks]

[*10 markah*]

SECTION B: 40 MARKS

BAHAGIAN B: 40 MARKAH

INSTRUCTION:

This section consists of **TWO (2)** essay questions. Answer **ALL** questions.

ARAHAN:

*Bahagian ini mengandungi **DUA (2)** soalan esei. Jawab **SEMUA** soalan.*

QUESTION 1

SOALAN 1

CLO1
C3

Based on the STUDENTFINE database on offences by PSMZA students as shown in **Table B1(i)**, apply normalization to the Unnormal Form (UNF) until all databases are normalized. Write the answer in **Table B1(ii)**.

*Berdasarkan pangkalan data STUDENTFINE mengenai kesalahan pelajar PSMZA seperti yang ditunjukkan dalam **Jadual B1(i)**, lakukan penormalan terhadap Bentuk Tidak Normal (UNF) sehingga kesemua pangkalan data ternormal. Tuliskan jawapan pada **Jadual B1(ii)**.*

Table B1(i) / *Jadual B1(i)*: STUDENTFINE

StudID	StudName	LicNo	CarReg	ReceiptNo	Date	OffCode	Offence	Fine(RM)
13DTK20F1001	Ali Ahmad	P1001	TBY7981	0-123	10/03/21	2	Traffic	30
				0-345	20/03/21	1	Discipline	20
13DEP19F2015	Seri Melati	P2010	CBD1236	0-357	25/04/21	2	Traffic	30
				0-111	07/03/21	2	Traffic	30
				0-857	10/08/21	3	Hostel	50
13DEE20F1021	Mei Ling	L1071	TAL2598	0-231	15/03/21	1	Discipline	20

* *Remarks – Stud (Student), Lic (License), Off (Offence)*

Table B1(ii)/*Jadual B1(ii)*

UNF	1NF	2NF	3NF

[20 marks]

[*20 markah*]

QUESTION 2

SOALAN 2

CLO1
C4

As the Database Administrator for Bumi Hijau Enterprise, you are responsible for ensuring the GARDEN Database System in **Table B2** is up to date and data access is controlled. The database contains three relation named GARDENER, PLANT and PLANTED.

*Sebagai Pentadbir Pangkalan Data untuk Bumi Hijau Enterprise, anda bertanggungjawab untuk memastikan Sistem Pangkalan Data GARDEN dalam **Jadual B2** adalah terkini dan capaian data terkawal. Pangkalan data ini mengandungi tiga jadual yang dinamakan GARDENER, PLANT dan PLANTED.*

Table B2 : GARDEN Database System

Jadual B2 : Sistem Pangkalan Data GARDEN

GARDENER

GarID	Name	Age
0	Abu Bakar	20
1	Salman	36
2	Zakiah	25
3	Zulaikha	18

PLANT

PlantID	Name	Temperature	Water	Weight
0	Tomato	25	0.82	0.08
1	Carrot	30	0.80	0.04
2	Corn	15	0.76	0.26
3	Cabbage	17	0.80	0.16
4	Lemon	27	0.84	0.02

PLANTED

PlantID	GarID	Location	Date	Seed
0	0	Rack 1	8/8/2021	28
0	1	Rack 2	7/10/2021	14
1	0	Rack 3	8/8/2021	36
2	3	Rack 4	5/3/2021	20
4	2	Rack 5	7/4/2021	12

Analyze the GARDEN Database System and write the SQL command to add an onion plant to the PLANT table with info as follows:
Analisa Sistem Pangkalan Data GARDEN dan tuliskan arahan SQL untuk menambah tanaman bawang ke dalam jadual PLANT dengan maklumat seperti berikut:

PlantID	5
Temperature	35
Water	1.05
Weight	0.1

Then, write SQL command to produce the following output.
Kemudian, tuliskan arahan SQL yang akan menghasilkan output berikut.

GARDENER NAME	PLANT NAME
Abu Bakar	Tomato
Salman	Tomato
Abu Bakar	Carrot
Zulaikha	Corn
Zakiah	Lemon

After that, write SQL command to get the minimum value, maximum value and average weight of plants by using Aggregate Functions and show its output. And lastly, illustrate the output table for the following SQL command:
Selepas itu, tulis arahan SQL untuk mendapatkan nilai minimum, nilai maksimum dan purata berat tumbuhan dengan menggunakan Fungsi Agregat dan tunjukkan outputnya. Dan akhir sekali, gambarkan jadual output untuk arahan SQL berikut:

```
SELECT PLANTED. PlantID, SUM(Seed)
FROM PLANT, PLANTED
WHERE PLANTED. PlantID = PLANT.PlantID
GROUP BY PLANTED. PlantID
```

[20 marks]
[*20 markah*]

SOALAN TAMAT