

SULIT



BAHAGIAN PEPERIKSAAN DAN PENILAIAN
JABATAN PENDIDIKAN POLITEKNIK
KEMENTERIAN PENDIDIKAN MALAYSIA

JABATAN TEKNOLOGI MAKLUMAT DAN KOMUNIKASI

PEPERIKSAAN AKHIR
SESI DISEMBER 2014

DFC2033: DATABASE SYSTEM

TARIKH : 07 APRIL 2015
MASA : 11.15 AM - 1.15 PM (2 JAM)

Kertas ini mengandungi **DUA PULUH TIGA (23)** halaman bercetak.

Bahagian A: Objektif (20 soalan)

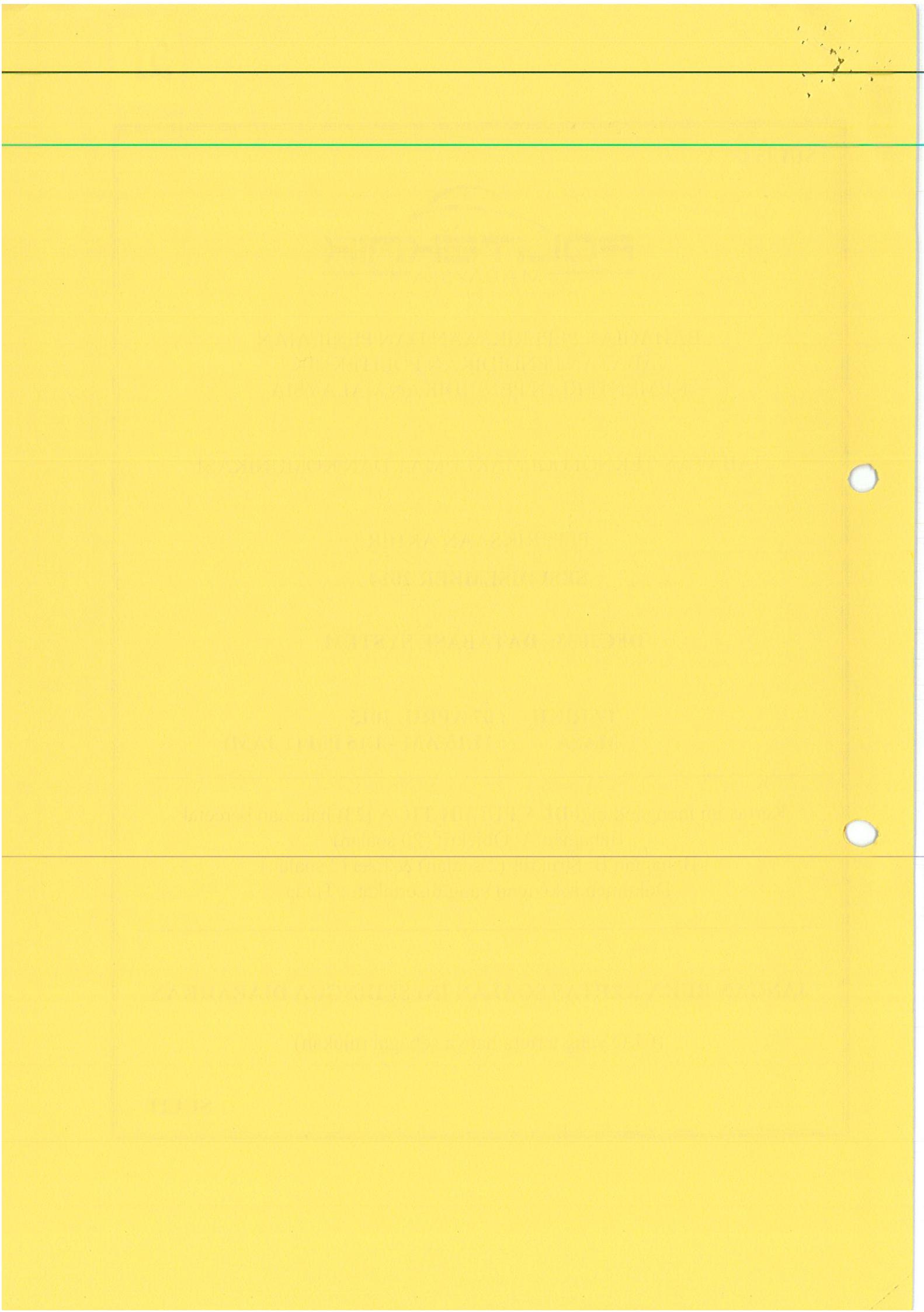
Bahagian B: Struktur (2 soalan) & Esei (2 soalan)

Dokumen sokongan yang disertakan : Tiada

JANGAN BUKA KERTAS SOALANINI SEHINGGA DIARAHKAN

(CLO yang tertera hanya sebagai rujukan)

SULIT



SECTION A : 30 MARKS**BAHAGIAN A : 30 MARKAH****INSTRUCTION:**

This section consists of **TWENTY (20)** objective questions. Mark your answers in the OMR form provided.

ARAHAN :

*Bahagian ini mengandungi **DUA PULUH (20)** soalan objektif. Tandakan jawapan anda di dalam borang OMR yang disediakan.*

CLO1
C1

1. Identify the **CORRECT** answer related to the following definition.

*Kenalpasti jawapan yang **BETUL** yang berkaitan dengan definisi berikut.*

A shared collection of logically related data, and a description of the data, designed to meet the information needs of an organization.

Perkongsian data yang saling berkaitan secara logik, dan penerangan data, direka untuk memenuhi keperluan maklumat sesebuah organisasi.

- A. Data
Data
- B. Database
Pangkalan data
- C. Metadata
Metadata
- D. Database Management System
Sistem Pengurusan Pangkalan Data

CLO1
C2

2. Identify the Database Management System(DBMS) feature that described by the following statement.

Pilih ciri Sistem Pengurusan Pangkalan Data (DBMS) yang dinyatakan dalam kenyataan berikut.

Language and graphical tools to define entities, relationships, integrity constraints and authorization rights.

Bahasa dan alatan grafik untuk mentakrifkan entiti, hubungan, kekangan integriti dan hak kuasa.

- A. Database definition
Definisi pangkalan data
- B. Nonprocedural access
Akses tidak berprosedur
- C. Application Development
Pembangunan aplikasi
- D. Procedural language interface
Antaramuka bahasa berprosedur

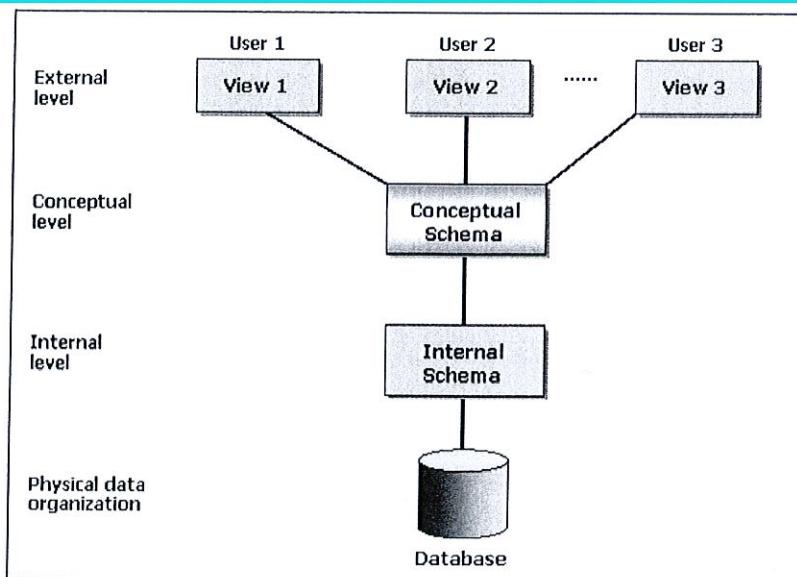


Figure A1: Three Tier ANSI SPARC / Rajah A1: Tiga Aras ANSI SPARC

CLO1
C3

3. Based on Figure A1, choose **TWO (2)** reasons for the separation of user applications and the physical database.

*Berdasarkan kepada Rajah A1, pilih **DUA (2)** sebab pemisahan aplikasi pengguna dan pangkalan data.*

- I. Enable virtual data storage.
Membolehkan penyimpanan data virtual.
 - II. Users can create their own program.
Pengguna boleh mencipta program sendiri.
 - III. Different users need different views of the same data.
Pengguna yang berbeza memerlukan pandangan yang berbeza untuk data yang sama.
 - IV. Users should not have to deal directly with the physical database storage details.
Pengguna tidak perlu berurusan terus dengan perincian simpanan fizikal pangkalan data.
- A. I and II / *I dan II*
 - B. I and IV / *I dan IV*
 - C. II and III / *II dan III*
 - D. III and IV / *III dan IV*

CLO1
C1

4. Which of the following terminology is synonymous to **table**?

- Yang manakah terminologi yang berikut sinonim dengan jadual ?.*
- A. Row / baris
 - B. Column / lajur
 - C. attribute / atribut
 - D. relation / hubungan

CLO1
C2

5. Based on the following statement, identify the null value.

Berdasarkan pernyataan yang berikut, kenalpasti nilai kosong.

The entity integrity rule states that for every instance of an entity, the value of the primary key must exist, be unique, and cannot be null.

Syarat integriti entiti menyatakan bahawa nilai bagi kunci utama mestilah wujud, unik, dan tidak boleh kosong bagi setiap entiti.

- A. A very small value
Nilai yang kecil
- B. An erroneous value
Nilai yang salah
- C. The absence of a value
Tiada nilai
- D. A numeric value with value 0
Nombor yang bernilai 0

CLO1
C3

6. Identify the suitable key for the given statement.

Pilih kunci yang bersesuaian untuk pernyataan yang diberi.

On a customer's table, data retrieval for a specific customer can be facilitated when a **customer's number**, **customers's name**, and **phone number** are used.

Dalam jadual pelanggan, penerimaan data untuk pelanggan yang khusus boleh dibantu apabila nombor pelanggan, nama pelanggan, dan nombor telefon digunakan.

- A. Customer's name is primary key
Nama pelanggan adalah kunci primer
- B. The secondary key is customer's name
Kunci sekunder ialah nama pelanggan
- C. Customer's number is the primary key
Nombor pelanggan adalah kunci primer
- D. The secondary key is combination of customer's name and phone number
Kunci sekunder ialah kombinasi nama pelanggan dan nombor telefon.

CLO2
C1

7. Select the result of the **JOIN** operator on **R** and **S** relation, if relation **R** has **n** attributes and relation **S** has **m** attributes.

Pilih hasil dari operator JOIN hubungan R dan S, jika hubungan R mempunyai n atribut dan hubungan S mempunyai m atribut,

- A. $R \times S$
- B. R / S
- C. $R - S$
- D. $R + S$

CLO2
C2

8. Identify the correct relational algebra statement to find the loan number which the amount of loan are greater than \$1200.

Kenalpasti pernyataan hubungan algebra yang betul untuk mendapatkan bilangan pinjaman di mana jumlah pinjaman adalah melebihi \$1200.

- A. $\sigma_{loan_number}(\Pi_{amount > 1200}(loan))$
- B. $\Pi_{loan_number}(\sigma_{amount > 1200}(loan))$
- C. $\Pi_{loan_number}(\sigma_{amount < 1200}(loan))$
- D. $\sigma_{loan_number}(\Pi_{amount < 1200}(loan))$

CLO1
C1

9. Choose the constraint that states no primary key value can be null.
Kenalpasti kekangan yang menyatakan kunci utama tidak boleh dikosongkan.

- A. Key
Kunci
- B. Domain
Domain
- C. Entity integrity
Integriti entiti
- D. Referential integrity
Integeriti rujukan

CLO1
C2

10. Identify the attribute that can be split into other components.

Kenalpasti atribut yang boleh dipecahkan kepada komponen yang lain.

- A. Simple Attribute
Atribut Mudah
- B. Derived Attribute
Atribut terbitan
- C. Composite Attribute
Atribut komposit
- D. Multi-Valued Attribute
Atribut pelbagai nilai

CLO1
C3

11. Identify basic elements in Entity Relationship Diagram.

- Pilih elemen asas dalam Rajah Hubungan Entiti.*
- I. Entity/ *Entiti*
 - II. Attribute /*Atribut*
 - III. Relationship /*Hubungan*
 - IV. Primary Key /*Kunci utama*
- A. I and II
I dan II
 - B. I and III
I dan III
 - C. I, II, and III
I, II, dan III
 - D. I, II, III and IV
I, II, III dan IV

CLO2
C1

12. Identify which of the following components represent a rectangle and diamond symbol in Entity Relationship Diagram.

Kenalpasti di antara berikut, komponen yang manakah mewakili simbol segiempat tepat dan rombus dalam Rajah Hubungan Entiti.

- A. Attribute and Entity/ *Atribut dan Entiti*
- B. Entity and Relationship/ *Entiti dan Hubungan*
- C. Relationship and Entity / *Hubungan dan Entiti*
- D. Stored and Derived Attribute / *Atribut Simpanan dan Atribut warisan*

CLO2

C1

13. Which of the following language is used to **update** database?

- A. DPL
- B. DDL
- C. DCL
- D. DML

CLO2

C1

14. Identify the SQL command that finds all groups to meet the specific conditions.

- Kenalpasti arahan SQL yang mencari semua kumpulan yang memenuhi syarat tertentu.*
- A. FIND
 - B. WHERE
 - C. SELECT
 - D. HAVING

CLO2

C2

15. Which of the following SQL commands used to remove rows from '**CUSTOMER**' table?

- Yang manakah arahan SQL yang berikut digunakan untuk membuang baris dalam jadual '**CUSTOMER**'?*
- A. DROP FROM CUSTOMER ...
 - B. UPDATE FROM CUSTOMER ...
 - C. REMOVE FROM CUSTOMER ...
 - D. DELETE FROM CUSTOMER WHERE ...

CLO2
C2

16. Which of the following SQL statement are used to alter column **Contact_No** from **Customer** table?

*Yang manakah arahan SQL yang berikut digunakan untuk mengubah lajur **Contact_No** dari jadual **Customer**?*

- A. ALTER TABLE Customer ADD (Contact_No);
- B. ALTER TABLE Customer DROP (Contact_No);
- C. ALTER TABLE Customer ALTER (Contact_No);
- D. ALTER TABLE Customer CHANGE (Contact_No);

CLO2
C3

17. The relation **R(a, b)** may have duplicate tuples. Identify which query has a result guaranteed of NON-DUPLICATING tuple, regardless of what tuple is in R.

*Hubungan **R(a, b)** mungkin mempunyai tindanan tupel. Kenalpasti pertanyaan yang dijamin **BUKAN** tupel yang bertindan, berdasarkan tupel R.*

- I. SELECT a FROM R WHERE a = 1
 - II. SELECT MAX(b) FROM R GROUP BY a
 - III. SELECT a, b FROM R GROUP BY a, b
 - IV. SELECT a FROM R WHERE a NOT IN (SELECT a FROM R)
- A. I and II
I dan II
- B. I and III
I dan III
- C. II and III
II dan III
- D. III and IV
III dan IV

CLO2
C1

18. Which of the following are NOT RELATED to properties of transaction?

- A. Atomic / Atomik
- B. Isolation / Pengasingan
- C. Durability / Ketahanan
- D. Concurrency / Keserentakan

CLO2
C2

19. The disadvantage of testing backup and recovery in database transaction management is ...

- Kelemahan ujian salinan dan pemulihan dalam pengurusan transaksi pangkalan data adalah ...*
- A. Archiving unused data from archived applications
Arkib data yang tidak digunakan daripada aplikasi bersara
- B. Improving the performance of the overall recovery strategy
Meningkatkan prestasi strategi pemulihan keseluruhan
- C. Discovering weaknesses in the backup strategy and resolving them
Mendedahkan kelemahan dalam strategi salinan dan menyelesaikan mereka
- D. Discovering hidden corrupt data in the database and propagating itself into backups
Mendedahkan data rosak yang tersembunyi di dalam pangkalan data dan menyebarkan dirinya menjadi salinan

CLO2
C3

20. Based on the statement below, identify the transaction property that is violated.

Berdasarkan pernyataan di atas, kenalpasti ciri transaksi yang telah dilanggar.

Several concurrent transaction are executed over the same data set while the second transaction updates the database before the first transaction is done.

Beberapa transaksi dilaksanakan serentak ke atas set data yang sama sementara transaksi kedua mengemaskinikan pangkalan data sebelum transaksi yang pertama selesai.

- A. Durability / Ketahanan
- B. Atomicity / Atomik
- C. Isolation / Pengasingan
- D. Consistency / Konsisten

SECTION B : 70 MARKS**BAHAGIAN B : 70 MARKAH****INSTRUCTION:**

This section consists of **FOUR (4)** structured questions. Answer **ALL** questions.

ARAHAN:

Bahagian ini mengandungi **EMPAT(4)** soalan berstruktur. Jawab semua soalan.

QUESTION 1***SOALAN 1***

- CLO1 C1 (a) State **TWO (2)** differences between Desktop Database and Server Database.
*Nyatakan **DUA (2)** perbezaan antara Pangkalan Data Desktop dan Pangkalan Data Pelayan.*
[2 marks]
[2markah]
- CLO1 C2 (b) Give **TWO (2)** examples of Database Management System (DBMS) which belongs to Desktop Database and Server Database.
*Berikan **DUA (2)** contoh Sistem Pengurusan Pangkalan Data (DBMS) yang tergolong di dalam Pangkalan Data Desktop dan Pangkalan Data Pelayan.*
[2 marks]
[2markah]

Question 1(c) until 1(f) are based on the following tables.

Soalan 1(c) hingga 1(f) adalah berdasarkan jadual di bawah.

branchNo	Street	City	Postcode
B005	Jalan Simpang Empat	Kulim	09000
B007	Jalan Tabung Haji	Guar Chempedak	08800
B008	Jalan Pegawai	Sungai Petani	08000
B009	Jalan Stadium	Alor Setar	04000

Table B1 : Branch / Jadual B1 : Branch

staffNo	Name	Position	Gender	branchNo
SL21	Azizah Safie	Manager	Female	B005
SG37	Umar Qayyum	Assistant	Male	B007
SG14	Juhairi Hanip	Supervisor	Male	B007
SA9	Nurhani Sabri	Assistant	Female	B008
SG5	Serm Teck Choon	Manager	Male	B009

Table B2 : Staff / Jadual B2: Staff

- CLO1 C1 (c) Write a complete relation scheme for Table B1 and B2.

Tuliskan skema hubungan yang lengkap untuk jadual B1 dan B2.

[2 marks]

[2markah]

- CLO1 C2 (d) Based on the following relational algebra query, determine the output.

Berdasarkan pertanyaan hubungan algebra berikut, tentukan output.

RESULT $\leftarrow \pi_{\text{branchNo}, \text{City}, \text{Postcode}} (\sigma_{\text{branchNo} = \text{B007}}^{(\text{Branch})})$

[2 marks]

[2markah]

- CLO2 C1 (e) State primary key and foreign key for Table B2.

Nyatakan kunci primer dan kunci asing bagi jadual Table B2.

[2 marks]

[2markah]

- CLO2
C3 (f) Construct a relation algebra to select the staffNo, Name, Position, Gender, branchNo and City.

Bina ungkapan algebra untuk memilih staffNo, Name, Position, Gender, branchNo dan City.

[2 marks]

[2markah]

Based on the business rules in Figure B1, answer questions from 1(g) until 1(j).

Berdasarkan peraturan perniagaan dalam Rajah B1, jawab soalan-soalan dari 1(g) hingga 1(j).

A company has several departments. Each department has a supervisor and at least one employee. Employees must be assigned to one department. Each employee should be assigned to one project or more. The important data fields are the names of the departments, projects name, supervisors name and employees name, as well as the supervisor number, employee number and a unique project number.

Sebuah syarikat mempunyai beberapa jabatan. Setiap jabatan mempunyai seorang penyelia dan sekurang-kurangnya seorang pekerja. Pekerja perlu ditempatkan di satu jabatan. Setiap pekerja perlu ditugaskan kepada satu projek atau lebih. Medan data penting adalah nama jabatan, nama projek, nama penyelia dan nama pekerja, serta nombor penyelia, nombor pekerja dan nombor projek unik.

Figure B1 / Rajah B1

- CLO1
C1 (g) List all the entities in business rules above.

Senaraikan semua entiti dalam peraturan perniagaan di atas

[2 marks]

[2markah]

- CLO1 (h) List all possible attributes that are involved in all entities in the business rules above.
C3

Senaraikan semua attribut yang terlibat di dalam semua entiti dalam peraturan perniagaan di atas.

[2 marks]

[2markah]

- CLO2 (i) State all the primary key in every entity.
C1

Nyatakan semua kunci utama di dalam setiap entiti.

[2 marks]

[2markah]

- CLO2 (j) One-to-Many relationship is where single entity instance of one type related to many entity instances of another type. Sketch one example of relationship related to the above business rules using Chen's Notation.
C3

Perhubungan Satu-ke-Banyak adalah di mana satu nilai daripada jenis entiti adalah berkait dengan banyak nilai daripada jenis entiti yang lain. Lakarkan satu contoh hubungan yang berkaitan dengan peraturan perniagaan di atas menggunakan Notasi Chen's.

[2 marks]

[2markah]

QUESTION 2**SOALAN 2**CLO2
C1

- (a) Briefly explain
- FOUR (4)**
- basic commands of Data Definition Language (DDL).

*Terangkan secara ringkas fungsi **EMPAT (4)** arahan asas Data Definition Language (DDL).*

[4 marks]

[4 markah]

Based on the Figure B2 below, write the SQL command for questions 2(b) and 2(c).

Berdasarkan Rajah B2 Rajah di bawah, tulis arahan SQL bagi soalan 2(b) dan 2(c).

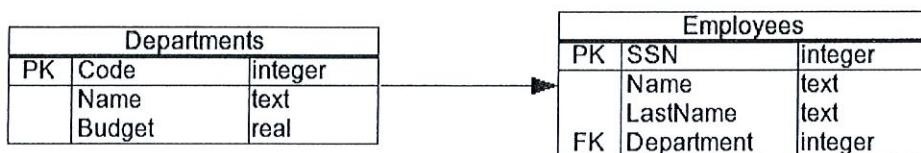


Figure B2 / Rajah B2

CLO2
C2

- (b) i. Reduce the budget of all departments by 10%.

Kurangkan bajet bagi semua jabatan sebanyak 10%.

[2 marks]

[2 markah]

- ii. Display all the records in Employees table.

Paparkan semua data di dalam jadual Employees.

[2 marks]

[2 markah]

CLO2
C3

- (c) Retrieve the number of employees in each department (you may only need to show the department code and the number of employees).

Dapatkan bilangan pekerja dalam setiap jabatan (anda hanya perlu menunjukkan kod jabatan dan bilangan pekerja).

[2 marks]

[2 markah]

CLO2 (d) Define the following terminology.

Definisikan terminologi berikut.

- i. Exclusive Lock

Kunci Eksklusif

- ii. Shared Lock

Kunci kongsian

[2 marks]

[2markah]

CLO2 C2 (e) Explain ONE (1) interference problem that can arise from simultaneous access to database.

Terangkan SATU (1) gangguan masalah yang akan timbul apabila berlaku akses secara serentak kepada pangkalan data.

[2 marks]

[2markah]

QUESTION 3**SOALAN 3**

- CLO1 (a) List the Three-Level Architecture of Database Management System(DBMS).
C1

Senaraikan Senibina Tiga Tahap Sistem Pengurusan Pangkalan Data(DBMS).

[3 marks]

[3 markah]

- CLO1 (b) State **THREE (3)** types of attributes in relational database.
C1

*Nyatakan **TIGA (3)** jenis atribut di dalam pangkalan data hubungan.*

[3 marks]

[3 markah]

- CLO1 (c) Identify **THREE (3)** main components in Entity Relationship Diagram (ERD) with a
C2 symbol.

*Kenalpasti **TIGA (3)** komponen utama di dalam Rajah Hubungan Entiti (ERD)beserta simbol.*

[3 marks]

[3 markah]

QUESTION 4
SOALAN 4

- CLO1 (a) State THREE (3) advantages of normalization process in database.
C1

Nyatakan TIGA (3) kebaikan proses pernormalan di dalam pangkalan data.

[3 marks]

[3 markah]

- CLO2 (b) Write an algebra operation based on relational schema below:
C2

Tulis satu operasi algebra berdasarkan skema hubungan di bawah.

Employee(Name, eId, MngrId, Salary) Manager(NameMgr, MngrId, mSalary)

- i. List the names and salaries of Employee table.

Senaraikan nama dan gaji dari jadual Employee.

[1 mark]

[1 markah]

- ii. List the names of manager who have salary greater than \$10000.

Senaraikan nama majikan yang mempunyai gaji melebihi \$10000.

[2 marks]

[2 markah]

CLO2
C1

- (c) Based on entity relationship diagram below, answer question c(i) and c(ii).

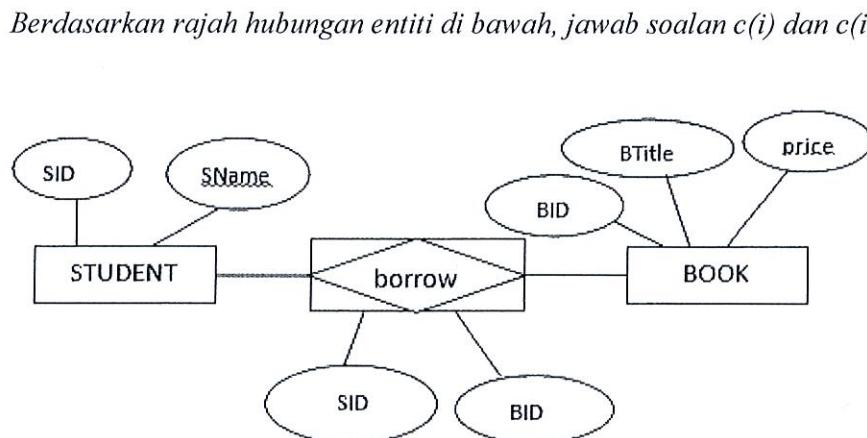


Figure B3 / Rajah B3

- i. List each entity into relational schema.

Senaraikan setiap entiti ke dalam skema hubungan.

[2 marks]

[2 markah]

- ii. Identify the type of relationship in the relational table.

Kenalpasti jenis perhubungan yang wujud dalam jadual hubungan.

[1 mark]

[1 markah]

Based on the following tables, answer question 4(d) and 4(e).

Berdasarkan jadual di bawah, jawab soalan 4(d) dan 4(e).

Id_Student (PK)	Name	Age	Sex	State
21DIP12F2001	Ali Azhar	20	M	Johor
21DIP11F2045	Raju A/L Kumar	19	M	Terengganu
21DIP13F2067	Yasmin Yusof	18	F	Sabah
21DIP11F2054	Zahlia Idris	18	F	Kelantan

Table B3: Student / Jadual B3: Student

Id_Lec (PK)	Lec_Name	Subject	State	Salary
3120	Norhaliza Idris	FP613	Penang	4000
5123	Azizah Safie	DFC2033	Kedah	3000

Table B4: Lecturer / Jadual B4: Lecturer

CLO2
C1

- (d) Write the SQL command to create both tables (Table B3 and Table B4).

Tuliskan arahan SQL untuk membina kedua-dua jadual (Jadual B3 dan B4).

[6 marks]

[6 markah]

CLO2
C2

- (e) i. Write the SQL command to display STUDENT tuples whose Age number is 19 years old and came from Kelantan.

Tuliskan arahan SQL untuk memaparkan PELAJAR yang berumur 19 tahun dan berasal dari Negeri Kelantan.

[3 marks]

[3 markah]

- ii. Write the SQL command to display all the records in Lecturer's table whose salary is more than RM 2000.

Tuliskan arahan SQL untuk memaparkan semua rekod di dalam jadual Lecturer di mana gaji adalah melebihi RM2000.

[3 marks]

[3 markah]

- CLO2 (f) What are the **THREE (3)** types of recovery tools in database transaction management?

*Apakah **TIGA (3)** jenis alat pemulihan dalam pengurusan transaksi di dalam pangkalan data?*

[3 marks]

[3 markah]

- CLO2 (g) Explain the **THREE (3)** types of recovery tools which have been listed in question 4 (f).

*Terangkan **TIGA (3)** jenis alat pemulihan yang telah disenaraikan dalam soalam 4(f).*

[3 marks]

[3 markah]

SOALAN TAMAT