

SULIT



BAHAGIAN PEPERIKSAAN DAN PENILAIAN  
JABATAN PENGAJIAN POLITEKNIK  
KEMENTERIAN PENDIDIKAN MALAYSIA

JABATAN TEKNOLOGI MAKLUMAT DAN KOMUNIKASI

PEPERIKSAAN AKHIR  
SESI JUN 2014

FP304 : DATABASE SYSTEM

TARIKH : 4 NOVEMBER 2014  
TEMPOH : 2.30 PM - 4.30 PM (2 JAM)

Kertas ini mengandungi **DUA PULUH (20)** halaman bercetak.

Bahagian A: Objektif (40 soalan)

Bahagian B: Struktur (2 soalan)

Dokumen sokongan yang disertakan : Tiada

**JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN**

(CLO yang tertera hanya sebagai rujukan)

**SULIT**



**SECTION A : 50 MARKS****BAHAGIAN A : 50 MARKAH****INSTRUCTION:**

This section consists of **FORTY (40)** objective questions. Mark your answers in the OMR form provided.

**ARAHAN :**

Bahagian ini mengandungi **EMPAT PULUH (40)** soalan objektif. Tandakan jawapan anda di dalam borang OMR yang disediakan.

CLO1-C1

1.

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

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

Identify the definition given.

Kenalpasti definisi diberi.

- A. Data  
*Data*
- B. DBMS  
*DBMS*
- C. Database  
*Pangkalan data*
- D. File based  
*Berasaskan fail*

CLO1-C1	<p>2. Choose the common features of Database Management System (DBMS). <i>Pilih ciri-ciri umum Sistem Pengurusan Pangkalan Data (DBMS).</i></p> <p>i. Non-procedural access <i>Akses tidak berprosedur</i></p> <p>ii. Procedural language interface <i>Antaramuka menggunakan Bahasa berprosedur</i></p> <p>iii. Transactional processing <i>Pemprosesan transaksi</i></p> <p>iv. Non-procedural language interface <i>Antaramuka menggunakan Bahasa tidak berprosedur</i></p> <p>A. i, ii and iv</p> <p>B. i ,ii and iii</p> <p>C. i and iv</p> <p>D. ii,iii and iv</p>
CLO1-C2	<p>3. Identify the DBMS feature that is used to monitor and improve database performance. <i>Kenal pasti ciri DBMS yang digunakan untuk memantau dan meningkatkan prestasi pangkalan data.</i></p> <p>A. Transactional processing <i>Pemprosesan transaksi</i></p> <p>B. Database tuning <i>Penalaan pangkalan data</i></p> <p>C. Application development <i>Pembangunan aplikasi</i></p> <p>D. Procedural language interface <i>Antaramuka menggunakan Bahasa berprosedur</i></p>
CLO1-C2	<p>4. Choose the level in the Three-Level ANSI-SPARC architecture that describes the part of database that is relevant to various view of user. <i>Pilih aras dalam Tiga-Aras seninbina ANSI-SPARC yang menyatakan sebahagian daripada pangkalan data yang relevan dengan pelbagai pandangan pengguna.</i></p> <p>A. external level <i>aras luaran</i></p> <p>B. conceptual level <i>aras konsep</i></p> <p>C. internal level <i>aras dalaman</i></p> <p>D. logical level <i>aras logik</i></p>

CLO1-C3

5. Client-server architectures provide a flexible way for DBMSs to interact with computer network. Determine the drawback of database Client server architectures.  
*Seni bina Pelanggan-pelayan menyediakan cara fleksibel untuk DBMS berinteraksi dengan rangkaian komputer. Tentukan kelemahan seni bina Pelanggan-pelayan.*
- A. Increased network, hardware and software transparency  
*Peningkatan ketelusan rangkaian, perkakasan dan perisian*
  - B. Increased cost  
*Peningkatan kos*
  - C. Lower network traffic  
*Trafik rangkaian yang lebih rendah*
  - D. Improved processing distribution  
*Pemprosesan pengedaran bertambah baik*

CLO1-C2

6. State the database application that describes an on-line commercial site such as eBay.com.  
*Nyatakan aplikasi pangkalan data yang menerangka mengenai laman komersial seperti eBay.com*
- A. single-user database application  
*aplikasi pangkalan data satu pengguna*
  - B. e-commerce database application  
*aplikasi pangkalan data e-perdagangan*
  - C. multiuser database application  
*aplikasi pangkalan data berbilang pengguna*
  - D. data mining database application  
*aplikasi pangkalan data perlombongan data*

CLO1-C1

7. The relational model uses some unfamiliar terminology. Choose the terminology that synonymous to attribute  
*Model hubungan menggunakan beberapa istilah yang asing. Pilih terminologi yang sinonim dengan atribut:*
- A. row  
*baris*
  - B. column  
*lajur*
  - C. degree  
*degree*
  - D. relation  
*hubungan*

CLO1-C2 8. Define what is the key where there is only one key in a relation.

*Kenalpasti nama kekunci apabila hanya satu kunci yang terdapat dalam satu hubungan.*

- A. Foreign  
*Asing*
- B. Primary  
*Utama*
- C. Candidate  
*Calon*
- D. Relation  
*Hubungan*

CLO1-C1 9. Degree is one of commonly used term in relational data model. Define degree.  
*Degree adalah terminologi yang biasanya digunakan di dalam model data hubungan.*  
*Takrifkan darjah.*

- A. Rows in a table  
*Baris di dalam jadual*
- B. Columns in a table  
*Lajur di dalam jadual*
- C. Number of rows in a table  
*Bilangan baris di dalam jadual*
- D. Number of columns in a table  
*Bilangan lajur di dalam jadual*

CLO1-C3 10. Choose the characteristics of relation scheme  
*Pilih ciri-ciri skema hubungan*

- i. Order of attributes and tuples does not have significance.  
*Kedudukan atribut dan tuple tidak penting.*
- ii. Relation name is distinct from all other relation names in database.  
*Nama hubungan adalah berbeza daripada semua nama-nama hubungan lain di dalam pangkalan data.*
- iii. A named of a relation is defined by a set of attributes and domain name pairs.  
*Nama hubungan ditakrifkan oleh satu set atribut dan nama domain pasangan.*
- iv. Values of an attribute are all from the different domain.  
*Nilai atribut adalah semua dari domain yang berbeza.*

- A. i, ii and iii
- B. i, ii, iii and iv
- C. ii, iii and iv
- D. i and ii

CLO1-C2

11. Determine the result of the UNION operation between relation R1 and R2.  
Tentukan hasil operasi UNION di antara jadual R1 dan R2.

- A. All the tuples of R1.  
*Semua tupel R1.*
- B. All the tuples of R2.  
*Semua tupel R2.*
- C. All the tuples of R1 and R2.  
*Semua tupel R1 dan R2.*
- D. All the tuples of R1 and R2 which have common columns.  
*Semua tupel R1 dan R2 yang mempunyai lajur yang sama.*

CLO1-C1

12. Recognize the process of monitoring and maintaining the system after installation in the Database System Lifecycle.

*Kenalpasti proses memantau dan mengekalkan sistem selepas pemasangan di dalam dalam Kitaran Sistem Pangkalan Data.*

- A. operational maintenance  
*mengekalkan operasi*
- B. database design  
*rekabentuk pengkalan data*
- C. implementation  
*implementasi*
- D. testing  
*pengujian*

CLO1-C1

13. Define the purpose of normalization .

*Definasikan fungsi normalisasi.*

- A. remove repeating group  
*memadamkan kumpulan yang berulang*
- B. optimize data retrieval performance  
*mengoptimumkan prestasi penerimaan data*
- C. provide a reason to renormalize the database  
*memberikan sebab untuk penormalan semula pangkalan data*
- D. reduce data redundancy and to eliminate anomalies  
*mengurangkan data yang berulang dan untuk menghapuskan anomal*

CLO3-C3

14. Select the correct relational algebra statement to find the loan number for each loan of an amount greater than \$1200

*Pilih pernyataan relational algebra yang betul untuk mendapatkan bilangan pinjaman untuk setiap pinjaman yang melebihi \$1200.*

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

CLO3-C3

15. State the normal form with no transitive functional dependency.

*Nyatakan bentuk normal yang tiada kebersandaran transitif.*

- A. 1NF
- B. 2NF
- C. 3NF
- D. BCNF

studId	studName	studState	studAdvisor	courseId
F2001	Muammar Gaddafi	Selangor	Syamsul Yusof	FP304
F2002	Admad Idham	Johor	Syamsul Yusof	FP305
F2003	Umar Qaisy	Terengganu	Syamsul Yusof	FP304
F2005	Lim Goh Tong	Kelantan	Haryani Harun	FP305
F2006	Tony Fernandez	Perak	Syamsul Yusof	FP304

Table 1 : Student

*Jadual 1 : Student*

CLO3-C3

16. Based on Table 1, determine the right relational algebra to retrieve all students' name that came from Kelantan.

*Berdasarkan Jadual 1, tentukan relational algebra yang betul untuk mendapatkan semua nama pelajar yang datang dari Kelantan.*

- A. Result  $\leftarrow \pi_{studName}(\sigma_{studState = 'Kelantan'}(Student))$
- B. Result  $\leftarrow \sigma_{studName}(\pi_{studState = 'Kelantan'}(Student))$
- C. Result  $\leftarrow \pi_{studName}(\bowtie_{studState = 'Kelantan'}(Student))$
- D. Result  $\leftarrow \sigma_{studName}(Student)(\mu_{studState = 'Kelantan'}(Student))$

CLO1-C3

17.

Occurs when an attribute is functionally dependent on only a part of multi attribute key (composite key).

*Berlaku apabila sesuatu sifat mempunyai kebergantungan fungsi kepada sebahagian daripada kekunci pelbagai atribut (kekunci komposit)*

Choose which the following lists that define the statement given.

Pilih manakah antara senarai yang mendefinisikan pernyataan di beri.

- A. Functional dependency  
*Kebersandaran fungsi*
- B. Partial Dependency  
*Kebersandaran separa*
- C. Transitive Dependency  
*Kebersandaran Transitif*
- D. Referential Integrity Constraint  
*Kekangan Referential Integrity*

CLO3-C1

18.

ISBN	SSN	WRITING QUALITY	PUBLISHER NAME
B1	A1	A	MC Graw Hill
B2	A1	B	Ouxton
B1	A2	C	Prentice Hall

Table 2: Book  
*Jadual 2: Book*

Based on Table 2, recognize the example of Transitive Functional Dependency.

*Berdasarkan Jadual 2, kenalpasti contoh bagi Transitive Functional Dependency.*

- A. SSN → publisher\_name
- B. ISBN → publisher\_name
- C. ISBN → writing\_quality
- D. ISBN → publisher\_location

CLO1-C3 19. Identify the basic element in Entity Relationship Diagram.

*Kenalpasti elemen asas dalam gambarajah hubungan Entiti.*

- i. Entity/ *Entiti*
  - ii. Attribute /*Atribut*
  - iii. Relationship /*Hubungan*
  - iv. Primary Key /*Kunci utama*
- 
- A. i, ii
  - B. ii and iii
  - C. i, ii and iii
  - D. i, ii, iii and iv

CLO1-C2 20. Choose the correct attribute that composed of multiple components.  
*Pilih attribute yang betul yang terdiri daripada pelbagai komponen.*

- A. Simple attribute  
*Atribut mudah*
- B. Derived attribute  
*Atribut terbitan*
- C. Composite attribute  
*Atribut komposit*
- D. Single valued attribute  
*Atribut satu nilai*

CLO1-C2 21. Select which of the following examples is an entity.  
*Pilih di antara contoh berikut, yang manakah satu adalah entity.*

- A. District name / *Nama kawasan*
- B. ISBN Number / *Nombor ISBN*
- C. Department / *Jabatan*
- D. Phone Number / *Nombor telefon*

CLO1-C2 22. Identify which of the following components represent a rectangle symbol in ERD?  
*Kenalpasti di antara berikut, komponen yang manakah mewakili simbol segiempat tepat dalam ERD?*

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

CLO2-C3

23. Identify which of the following attributes is NOT solitary or single-valued attribute.

*Kenalpasti atribut di bawah yang bukan merupakan atribut tunggal atau atribut bersendirian.*

- A. Name / Nama
- B. Gender / Jantina
- C. ID Student / ID Pelajar
- D. Address / Alamat

CLO3-C3

24. Select what is the cardinality of a table with 1000 rows and 10 columns.

*Pilih apakah kardinaliti jadual yang mempunyai 1000 baris dan 10 lajur.*

- A. 10
- B. 10000
- C. 1000
- D. 100

CLO3-C3

25. Choose the Data Manipulation Language (DML) commands.

*Pilih arahan Data Manipulasi Bahasa (DML).*

- A. INSERT, UPDATE, DROP, SELECT
- B. INSERT, UPDATE, DELETE, SELECT
- C. INSERT, MODIFY, DELETE, DROP
- D. CREATE, UPDATE, DELETE, SELECT

CLO3-C4

26.

- i. Delete table structure

*Memadam struktur jadual*

- ii. Cannot be recovered

*Tidak boleh dikembalikan*

- iii. Use with caution

*Gunakan dengan berhati-hati*

- iv. Deletes all data

*Memadam semua data*

Choose the right SQL syntax below which describes the above statement.

*Pilih sintaks SQL yang betul di bawah yang menerangkan pernyataan di atas.*

- A. DELETE
- B. DROP
- C. REMOVE
- D. TRUNCATE

CLO3-C1

27. Recognize the command that finds all groups meeting the stated conditions.  
*Kenalpasti arahan yang mencari semua kumpulan yang memenuhi syarat yang diberikan.*

- A. Having
- B. Where
- C. Select
- D. Find

CLO3-C3

28. Identify the correct query for using comparison operators in SQL.  
*Kenalpasti kueri yang betul untuk menggunakan operator perbandingan di dalam SQL.*

- A. SELECT sname, coursename FROM studentinfo WHERE age>50 and <80;
- B. SELECT sname, coursename FROM studentinfo WHERE age>50 and age <80;
- C. SELECT sname, coursename FROM studentinfo WHERE age>50 and WHERE age<80;
- D. SELECT sname, coursename FROM studentinfo WHERE age>50 && age<80;

CLO3-C2

29. Identify the output when SQL statement below is executed.  
*Kenalpasti hasil paparan apabila pernyataan SQL di bawah dilaksanakan.*

```
Update Product
Set unit_price = 500
Where prod_id = 10;
```

- A. Change the unit price of table Product to 10.  
*Mengubah harga satu unit dalam jadual Produk kepada 10.*
- B. Change the length of value in a Product table to 500.  
*Mengubah panjang nilai dalam jadual Produk kepada 500.*
- C. Changes the unit price to 500 in Product table where prod\_id is equal to 10.  
*Menukar harga unit kepada 500 dalam jadual Produk di mana prod\_id sama dengan 10.*
- D. Updates the Product table to have a unit price of 500  
*Kemaskini jadual Produk ini yang mempunyai harga unit 500*

CLO3-C2

30. Choose the number of columns will be shown from the following query.  
*Pilih berapa bilangan lajur yang akan dipaparkan daripada pada query berikut.*

```
SELECT student_no, name, department, address, email  
FROM student;
```

- A. 3
- B. 4
- C. 5
- D. 6

CLO3-C2

31. Identify the output for SQL statement below if the table contains the values 50, 40, 30, 20, NULL and NULL.

*Kenalpasti bagi pernyataan SQL di bawah sekiranya jadual tersebut mengandungi nilai 50, 40, 30, 20, NULL dan NULL.*

```
SELECT COUNT(col) FROM tab;
```

- A. 3
- B. 4
- C. 6
- D. 140

CLO1-C1

32. Select the SQL statement that you would use to define primary key for a new table named ACTOR with primary key column named ACTOR\_ID.

*Pilih pernyataan SQL yang akan anda gunakan untuk menetapkan kunci utama bagi jadual baru bernama ACTOR di mana lajur kunci primer bernama ACTOR\_ID.*

- A. MODIFY TABLE ACTOR ADD PRIMARY KEY (ACTOR\_ID);
- B. UPDATE TABLE ACTOR ADD PRIMARY KEY (ACTOR\_ID);
- C. CHANGE TABLE ACTOR ADD PRIMARY KEY (ACTOR\_ID);
- D. ALTER TABLE ACTOR ADD PRIMARY KEY (ACTOR\_ID);

CLO3-C3

33. A lecturer wants to update a student mark from SPMP by using SQL query (Table 3). But he causes a mistake where he accidentally updated all the student marks in the table into 100% by using a SQL query (Table 4). Analyze his mistakes.  
*Seorang pensyarah hendak mengemaskini markah seorang pelajar dari SPMP menggunakan query SQL (Jadual 3). Tetapi dia melakukan kesilapan di mana dia telah mengemaskini kesemua markah pelajar di dalam jadual itu kepada 100% dengan kueri SQL secara tidak sengaja (Jadual 4). Analisa kesilapan pegawai ini.*

Matric No	Name	Course	Marks
10DIP10F1003	Muhd Ali	FP304	70
10DIP10F1004	Sazana Ramli	FP304	65
10DIP10F1005	Halim Romi	FP304	50
10DIP10F1006	Ramzi Hanafi	FP304	100

Table 3 / Jadual 3

Matric No	Name	Course	Marks
10DIP10F1003	Muhd Ali	FP304	100
10DIP10F1004	Sazana Ramli	FP304	100
10DIP10F1005	Halim Romi	FP304	100
10DIP10F1006	Ramzi Hanafi	FP304	100

Table 4 / Jadual 4

- A. The officer inserted new rows replacing the old data one by one  
*Pegawai itu memasukkan baris baru bagi menggantikan data lama satu per satu*
- B. The officer is using UPDATE sql without key constraints with WHERE clause  
*Pegawai itu menggunakan sql UPDATE tanpa konstrain kekunci dengan klausa WHERE*
- C. The officer is actually using INSERT sql with key constraints with WHERE clause then eventually created new data and new rows  
*Pegawai itu sebenarnya menggunakan sql INSERT dengan konstrain kekunci dengan klausa WHERE dan kemudiannya membina data baru dan baris baru*
- D. The officer is using UPDATE sql.  
*Pegawai itu menggunakan sql UPDATE.*

CLO3-C3

34. By using SQL, how do you select all the records from the Employee table where the column FirstName begins with the letter A?

*Dengan menggunakan SQL, bagaimana anda memilih semua rekod daripada jadual Employee di mana nilai lajur FirstName bermula dengan huruf A?*

- A. SELECT ALL FROM EMPLOYEE WHERE FirstName = 'A';
- B. SELECT ALL FROM EMPLOYEE WHERE FirstName LIKE 'A%';
- C. SELECT \* FROM EMPLOYEE WHERE FirstName LIKE 'A%';
- D. SELECT \* FROM EMPLOYEE WHERE FirstName = 'A' ;

CLO2-C1

35. Database locking concept is used to solve the problem of :  
*Database Locking digunakan untuk menyelesaikan masalah:*

- A. Lost Update  
*Pengemaskinian Hilang*
- B. Uncommitted Dependency  
*Uncommitted dependency*
- C. Inconsistent Data  
*Data tidak konsisten*
- D. All of the above  
*Semua di atas*

CLO2-C1

36. Identify the transaction properties described in the following statement:  
*Kenalpasti ciri transaksi yang digambarkan dalam pernyataan berikut:*

This property ensures that once transaction charges are done, they cannot be undone or lost, even in the event of a system failure

*Ciri ini memastikan apabila perubahan transaksi lengkap, ianya tidak dapat diubah atau hilang, walaupun berlakunya kerosakan sistem*

- A. Isolation  
*Terpisah*
- B. Durability  
*Kekal*
- C. Atomicity  
*Atomik*
- D. Consistency  
*Konsisten*

CLO2-C2

37. Identify type of lock that can cause deadlock.  
*Kenal pasti jenis kunci yang boleh menyebabkan deadlock.*

- A. Binary  
*Binari*
- B. Shared  
*Kongsian*
- C. Complete  
*Lengkap*
- D. Exclusive  
*Eksklusif*

- CLO2-C1 38. Identify the process of restoring the database to its correct state following a failure.  
*Kenalpasti proses mengembalikan pangkalan data ke keadaan yang betul berikutkan kegagalan.*
- A. Back up
  - B. Delete data
  - C. Concurrency
  - D. Database recovery
- CLO2-C3 39. You are monitoring the company database, on a SQL Server 2008. You find out that one of the data file computer is corrupted. You should reserve the database which is from the most recent configuration of backup. In order to reducea the lost, find out the method as quickly as possible.  
*Anda memantau pangkalan data syarikat iaitu SQL Server 2008. Anda mengetahui bahawa salah satu fail data komputer rosak. Anda perlu mempunyai pangkalan data yang mempunyai konfigurasi salinan paling terkini. Dalam usaha untuk mengurangkan kehilangan data, kenalpasti kaedah yang sesuai digunakan*
- A. You should run a transaction log backup for the database  
*Anda perlu membuat salinan transaksi log pada pangkalan*
  - B. You should reserve the old database backup for the database  
*Anda perlu menggunakan salinan pangkalan data lama pada pangkalan data*
  - C. You should reserve the most recent store produce log backup for the database  
*Anda perlu mempunyai penyimpanan yang paling terkini bagi menghasilkan log salinan untuk pangkalan data*
  - D. You should run the whole database backup  
*Anda sepatutnya membuat salinan penuh pada pangkalan data*
- CLO2-C2 40. Identify the process of managing simultaneous operation on the database without having them interfere with one another.  
*Kenalpasti proses menguruskan operasi serentak pada pangkalan data tanpa mengganggu antara satu sama lain.*
- A. Serializability / Kebersirian
  - B. Recoverability / Kebolehpulihan
  - C. Concurrency control / Kawalan keserentakan
  - D. Transaction management / Pengurusan transaksi

**SECTION B : 50 MARKS****BAHAGIAN B : 50 MARKAH****INSTRUCTION:**

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

**ARAHAN:**

Bahagian ini mengandungi **DUA (2)** soalan berstruktur. Jawab semua soalan.

**QUESTION 1****SOALAN 1**

- CLO2-C2 (a) Briefly describe **THREE (3)** advantages of normalization process in database.  
*Terangkan secara ringkas **TIGA (3)** kebaikan proses pernormalan di dalam database.*

[6 marks]  
[6 markah]

- CLO1-C1 (b) State **TWO** differences between Desktop Database and Server Database  
*State **DUA** perbezaan antara pangkalan data Desktop dan pangkalan data Pelayan*

[4 marks]  
[4 markah]

- CLO1-C2 (c) Explain the following relational algebra operators and write the symbols.

*Terangkan hubungan operasi algebra berikut dan tuliskan simbolnya.*

- |               |           |
|---------------|-----------|
| i. Difference | [2 marks] |
| ii. Project   | [2 marks] |

CLO3-C3

- (d) Based on the following table, answer each question.  
*Berdasarkan jadual di bawah, jawab soalan berikut.*

Id_Student	Name	Age	Sex	State
1001	Ali Azhar	20	M	Johor
1002	Raju A/L Kumar	19	M	Terengganu
1003	Serm Teck Choon	19	M	Kedah
1004	Yasmin Yusof	18	F	Sabah
1005	Zahlia Idris	18	F	Kelantan

Table B1: Student / Jadual B1: Student

Id_Lec	Lev_Name	Subject	State	Salary
3120	Liyana Rani	FP512	Kelantan	2300
3333	Nurhani Sabri	FP521	Sabah	4000
5123	Azizah Safie	FP613	Kedah	2000

Table B2: Lecturer / Jadual B2: Lecturer

- i. Write the relation algebra to select the STUDENT tuples whose Age number is 19years old and State is Kedah.  
*Tulis Ungkapan Algebra untuk pilih data PELAJAR yang berumur 19 tahun dan berasal dari Negeri Kedah.*

[2 marks]  
[2 markah]

Generate the table to represent the output of each operation below.  
*Jana jadual untuk mewakili output setiap operasi di bawah.*

- ii.  $\text{RESULT} \leftarrow \pi_{\text{State}}(\text{STUDENT}) - \pi_{\text{State}}(\text{LECTURER})$

[3 marks]  
[3 markah]

- iii.  $\text{RESULT} \leftarrow \pi_{\text{State}}(\text{STUDENT}) \cap \pi_{\text{State}}(\text{LECTURER})$

[3 marks]  
[3 markah]

CLO3-C3

- (e) Write the Relational algebra expression for the following situation.  
*Tulis ungkapan algebra hubungan untuk situasi yang berikut.*

Patient ( pat#, pat\_name , age, ward#)

Doctor ( doc#, doc\_name, address, salary , ward#, )

Ward (ward#, ward\_name, location )

- i. Display all patients' names which are in wad number 3.

*Paparkan semua nama pesakit yang berada di ward nombor 3*

[2 marks]

[2 markah]

- ii. The ward location where patient name "Ahmad" is treated.

*Lokasi wad di mana pesakit bernama Ahmad dirawat.*

[3 marks]

[3 markah]

**QUESTION 2****SOALAN 2**

CLO2-C1

- (a) Define the following terminology.  
*Definisikan terminologi berikut.*

- i. Binary Lock  
*Kunci binari*
- ii. Exclusive Lock  
*Kunci Ekslusif*
- iii. Shared Lock  
*Kunci kongsian*

[6 Marks]

[6 Markah]

CLO3-C3

- (b) Using Crow's Foot Notation, illustrate the ER-Diagram and cardinality constraint for the situation below.

*Menggunakan Notasi Crow's Foot, lukiskan ER-Diagram dan kekangan kardinaliti bagi situasi di bawah.*

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, supervisors and employees, as well as the supervisor and employee number and a unique project number.

*Sebuah syarikat mempunyai beberapa jabatan. Setiap jabatan mempunyai seorang penyelia dan sekurang-kurangnya seorang pekerja. Sekurang-kurangnya satu pekerja perlu diberi kepada setiap jabatan. Setiap pekerja perlu ditugaskan kepada satu projek atau lebih. Data penting adalah nama jabatan, projek, penyelia dan pekerja, dan juga nombor penyelia, pekerja dan projek yang unik.*

[8 Marks]

[8 Markah]

CLO3-C3

- (c) Based on the Figure 3 below, write the SQL command for each of the following questions.

*Berdasarkan Rajah 3 Rajah di bawah, tulis arahan SQL bagi setiap soalan berikut.*



Figure 3 / Rajah 3

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

*Kurangkan bajet bagi semua jabatan sebanyak 10%.*

[2 marks]

[2 markah]

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

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

[3 marks]

[3 markah]

- (d) Briefly explain THREE (3) types of recovery tools in database transaction management.

*Terangkan secara ringkas TIGA (3) jenis alat pemulihan dalam pengurusan transaksi di dalam pangkalan data.*

[6 marks]

[6 markah]

**SOALAN TAMAT**

