



FINAL EXAMINATION / PEPERIKSAAN AKHIR
SEMESTER I – SESSION 2020 / 2021 / SEMESTER I – SESI 2020 / 2021
PROGRAM KERJASAMA

COURSE CODE : DDWC 2483
KOD KURSUS

COURSE NAME : DATABASE
NAMA KURSUS PANGKALAN DATA

YEAR / PROGRAMME : 2 DDWZ
TAHUN / PROGRAM

DURATION : 3 HOURS (INCLUDING SUBMISSION HOUR)
TEMPOH 3 JAM (TERMASUK MASA PENGHANTARAN)

DATE : NOVEMBER 2020
TARIKH NOVEMBER 2020

INSTRUCTION / ARAHAN:

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1. The question paper consists of **4 PARTS**: A, B, C. and D.
Kertas soalan terdiri daripada 4 BAHAGIAN: A, B C dan D.
 2. Answer **ALL** questions and write your answers on the answer sheet.
Jawab SEMUA soalan dan tulis jawapan anda pada kertas jawapan.
 3. Write your name, matric no., identity card no., course code, course name, section no. and lecturer's name on the first page (in the upper left corner) and every page thereafter on the answer sheet.
Tulis nama anda, no. matrik, no. kad pengenalan, kod kursus, nama kursus, no. seksyen dan nama pensyarah pada muka surat pertama (penjuru kiri atas) kertas jawapan dan pada setiap muka surat jawapan.
 4. Each answer sheet must have a page number written at the bottom right corner.
Setiap helai kertas jawapan mesti ditulis nombor muka surat pada bahagian bawah penjuru kanan.
 5. Answers should be handwritten, neat and clear.
Jawapan hendaklah ditulis tangan, kemas dan jelas menggunakan huruf cerai.
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WARNING / AMARAN

Students caught copying / cheating during the examination will be liable for disciplinary actions and the faculty may recommend the student to be expelled from sitting for exam.

Pelajar yang ditangkap meniru / menipu semasa peperiksaan akan dikenakan tindakan disiplin dan pihak fakulti boleh mengesyorkan pelajar diusir dari menduduki peperiksaan.

This examination paper consists of **12** pages including the cover.
Kertas soalan ini mengandungi 12 muka surat termasuk kulit hadapan.

ONLINE EXAMINATION RULES AND REGULATIONS
PERATURAN PEPERIKSAAN SECARA DALAM TALIAN

1. Student must carefully listen and follow instructions provided by invigilator.
Pelajar mesti mendengar dan mengikuti arahan yang diberikan oleh pengawas peperiksaan dengan teliti.
2. Student is allowed to start examination only after confirmation of invigilator if all needed conditions are implemented.
Pelajar dibenarkan memulakan peperiksaan hanya setelah pengesahan pengawas peperiksaan sekiranya semua syarat yang diperlukan telah dilaksanakan.
3. During all examination session student has to ensure, that he is alone in the room.
Semasa semua sesi peperiksaan pelajar harus memastikan bahawa dia bersendirian di dalam bilik.
4. During all examination session student is not allowed to use any other devices, applications except other sites permitted by course lecturer.
Sepanjang sesi peperiksaan pelajar tidak dibenarkan menggunakan peranti dan aplikasi lain kecuali yang dibenarkan oleh pensyarah kursus.
5. After completing the exam student must inform invigilator via the set communication platform (eg. WhatsApp etc.) about completion of exam and after invigilator's confirmation leave examination session.
Selepas peperiksaan selesai, pelajar mesti memaklumkan kepada pengawas peperiksaan melalui platform komunikasi yang ditetapkan (contoh: Whatsapp dan lain-lain) mengenai peperiksaan yang telah selesai dan meninggalkan sesi peperiksaan selepas mendapat pengesahan daripada pengawas peperiksaan.
6. Any technical issues in submitting answers online have to be informed to respective lecturer within the given 30 minutes. Request for re-examination or appeal will not be entertain if complains are not made by students to their lecturers within the given 30 minutes.
Sebarang masalah teknikal dalam menghantar jawapan secara dalam talian perlu dimaklumkan kepada pensyarah masing-masing dalam masa 30 minit yang diberikan. Permintaan untuk pemeriksaan semula atau rayuan tidak akan dilayan sekiranya aduan tidak dibuat oleh pelajar kepada pensyarah mereka dalam masa 30 minit yang diberikan.
7. During online examination, the integrity and honesty of the student is also tested. At any circumstances student is not allowed to cheat during examination session. If any kind of cheating behaviour is observed, UTM have a right to follow related terms and provisions stated in the respective Academic Regulations and apply needed measures.
Semasa peperiksaan dalam talian, integriti dan kejujuran pelajar juga diuji. Walau apa pun keadaan pelajar tidak dibenarkan menipu semasa sesi peperiksaan. Sekiranya terdapat sebarang salah laku, UTM berhak untuk mengikuti terma yang dinyatakan dalam Peraturan Akademik.

SECTION A / SEKSYEN A

TRUE / FALSE QUESTIONS [10 MARKS] / SOALAN BENAR / SALAH [10 MARKAH]

Answer all the following questions. / Jawab semua soalan berikut.

1. A database is a collection of related data.
Pangkalan data ialah koleksi data yang berkaitan.
2. A DBMS catalog stores the meta-data describing the structure of the database.
Katalog DBMS menyimpan meta-data menerangkan struktur pangkalan data.
3. A DBMS is responsible for enforcing all the constraints of a data model.
DBMS bertanggungjawab untuk memaksa kesemua konstrain model data.
4. DBMS stores data efficiently with little wasted space.
DBMS menyimpan data secara teratur dengan ruang penyimpanan yang kecil.
5. The primary key does not necessarily have to be unique for a given table.
Kunci utama tidak semestinya unik untuk table yang diberikan.
6. A tuple is the set of allowable values for one or more attributes.
Tuple ialah set yang membenarkan nilai satu atau lebih atribut.
7. In First Normal Form, every attribute must be in atomic value.
Dalam Bentuk Penormalan Pertama, setiap atribut mestilah dalam nilai atomik.
8. The value of one attribute determines the value of another attribute refers to functional dependencies.
Nilai satu atribut menentukan nilai atribut yang lain merujuk kepada kebergantungan berfungsi.
9. An entity refers to an output of the database.
Entiti merujuk kepada output pangkalan data.
10. Database Administration is a technical function that is responsible for physical database design and for dealing with technical issues.
Pentadbiran pangkalan data adalah fungsi teknikal yang bertanggungjawab untuk reka bentuk pangkalan data fizikal dan untuk menangani isu-isu teknikal.

SECTION B / SEKSYEN B

OBJECTIVE QUESTIONS: [20 MARKS] / SOALAN OBJEKTIF [20 MARKAH]

Answer all the following questions. / Jawab semua soalan berikut.

1. Which of the following is NOT an application of database system in real life?
Yang manakah antara berikut BUKAN aplikasi sistem pangkalan data dalam kehidupan sebenar?
 - A) Book a flight ticket / *Tempah tiket penerbangan*
 - B) Purchase using your money / *Membeli dengan duit sendiri*
 - C) Study at Polytechnic / *Belajar di Politeknik*
 - D) Buy cloth from supermarket / *Beli pakaian dari pasaraya*

2. A Database Management System (DBMS) is a _____.
Database Management System(DBMS) adalah _____.
 - A) collection of persistent data that can be shared and interrelated.
pengumpulan data berterusan yang dapat dikongsi dan saling berkaitan
 - B) tool to monitor and improve database performance.
alat untuk memantau dan meningkatkan prestasi pangkalan data.
 - C) control mechanisms to prevent interference from simultaneous users and recover lost data after a failure.
mekanisme kawalan untuk mengelakkan gangguan daripada pengguna serentak dan memulihkan data yang hilang setelah kegagalan.
 - D) software system used to create, maintain, and provide controlled access to a database.
sistem perisian yang digunakan untuk membuat, memelihara, dan menyediakan akses terkawal ke pangkalan data.

3. The function of a database is to _____.
Fungsi pangkalan data adalah untuk _____.
 - A) collect and organize input data / *mengumpul dan menyusun data input*
 - B) check all input data / *menyemak semua input data*
 - C) check all spelling / *menyemak semua ejaan*
 - D) output data / *data output*

4. A top-to-bottom relationship among the items in a database is established by a
Hubungan top-bottom diantara semua item dalam pangkalan data
- A) hierarchical schema / *skema hirarki*
 - B) network schema / *skema rangkaian*
 - C) relational schema / *skema relasi*
 - D) all of the above / *semua diatas*
5. 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 Primer*
- A) i and ii / *i dan ii*
 - B) i, ii and iii / *i, ii dan iii*
 - C) i, ii, iii and iv / *i,ii, iii dan iv*
 - D) ii and iii / *ii dan iii*
6. Select the **CORRECT** statement about relationships.
*Pilih pernyataan yang **BETUL** mengenai hubungan.*
- A) Relationship always exist between 3 or more attributes /
Hubungan sentiasa wujud antara 3 atau lebih atribut
 - B) Relationships always exist between 3 or more entities /
Hubungan sentiasa wujud antara 3 atau lebih entiti
 - C) Relationships always exist between 2 entities (or one entity and itself) /
Hubungan sentiasa wujud antara 2 entiti (atau satu entiti dan dirinya)
 - D) Relationships always exist between 2 attributes /
Hubungan sentiasa wujud antara 2 atribut

7. Which of the following is the **CORRECT** order of keywords for SQL SELECT statements?

*Antara berikut yang manakah turutan yang **BENAR** untuk penyata SQL SELECT?*

- A) SELECT, FROM, WHERE
- B) FROM, WHERE, SELECT
- C) WHERE, FROM, SELECT
- D) SELECT, WHERE, FROM

8. What is the difference between the DELETE and DROP command?

Apakah perbezaan diantara arahan DELETE and DROP?

- A) DELETE command will delete row(s) of a table while DROP command delete the structure and content (data) of the table.

Perintah DELETE akan menghapus baris jadual sementara perintah DROP menghapus struktur dan kandungan (data) jadual.

- B) DROP command will delete row(s) of a table while DELETE command delete the structure and content (data) of the table.

Perintah DROP akan menghapus baris dari jadual sementara perintah DELETE menghapus struktur dan kandungan (data) jadual.

- C) DELETE command will delete row(s) of a table while DROP command delete content (data) of the table.

Perintah DELETE akan menghapus baris dari jadual sementara perintah DROP menghapus kandungan (data) dari jadual.

- D) DROP command will delete row(s) of a table while DELETE command delete content (data) of the table.

Perintah DROP akan menghapus baris jadual sementara perintah DELETE menghapus kandungan (data) jadual.

9. State the normal form with no partial dependencies.

Nyatakan bentuk penormal yang tiada kebersandaran separa.

- A) 1 NF
- B) 2 NF
- C) 3 NF
- D) Boyce Code NF

10. Define the purpose of normalization.

Definisikan tujuan normalisasi.

- A) remove repeating group /
memadamkan kumpulan 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 menghapuskan anomali

SECTION C / SEKSYEN C

STRUCTURED QUESTIONS: [50 MARKS] / SOALAN STRUKTUR: [50 MARKAH]

Answer all the following questions. / Jawab semua soalan berikut.

QUESTION 1 / SOALAN 1

Database is a collection of persistent data that can be shared and interrelated.

- (a) Explain **TWO (2)** properties of database **[2M]**
Terangkan DUA (2) ciri-ciri pangkalan data.
- (b) Explain **TWO (2)** features of Database Management System. **[2M]**
Terangkan DUA (2) kelebihan Database Management System.
- (c) List and briefly explain the **THREE (3)** levels of schema architecture of database system. **[6M]**
Senaraikan dan terangkan secara ringkas TIGA (3) aras dalam rekabentuk skema pangkalan data.

QUESTION 2 / SOALAN 2

- (a) State the advantages and disadvantages of database system compared to a file processing system. **[4M]**
Nyatakan kebaikan dan keburukan sistem pangkalan data berbanding sistem pemprosesan fail.
- (b) Illustrate **THREE (3)** most common relationships in E-R model. **[6M]**
Lakarkan TIGA (3) hubungan paling biasa dalam model E-R.

QUESTION 3 / SOALAN 3

- (a) What is normalization? State **TWO (2)** goals of normalization. **[6M]**
Apakah normalisasi? Nyatakan DUA (2) tujuan normalization.
- (b) Define the following terms: **[4M]**
Definisikan terms berikut:
- i. Update anomalies
 - ii. Delete anomalies
 - iii. Insert anomalies

QUESTION 4 / SOALAN 4

- (a) What is relation? State **TWO (2)** requirements for a table to qualify as a relation. **[3M]**
*Apakah relasi? Nyatakan **DUA (2)** ciri untuk sebuah table yang berkelayakan sebagai relasi.*
- (b) Why referential integrity rule is important? How can this rule protect / preserve the integrity of database? **[5M]**
Mengapa referential integrity penting? Bagaimana rule ini boleh melindungi integriti pangkalan data.
- (c) What is functional dependency? **[2M]**
Apakah fungsi kebergantungan?

QUESTION 5 / SOALAN 5

Study the tables STUDENT, ENROLL and CLASS in Figure 1 below:

Kaji jadual STUDENT, ENROLL dan CLASS dalam Rajah 1 di bawah:

STUDENT					
STU_NUM	STU_LNAME				
321452	Bowser				
324257	Smithson				
ENROLL					
CLASS_CODE	STU_NUM	ENROLL_GRADE			
10014	321452	C			
10014	324257	B			
10018	321452	A			
10018	324257	B			
10021	321452	C			
10021	324257	C			
CLASS					
CLASS_CODE	CRS_CODE	CLASS_SECTION	CLASS_TIME	CLASS_ROOM	PROF_NUM
10014	ACCT-211	3	THUR, 2:30 - 3.45 PM	BUS252	342
10018	CIT-220	2	MON, 9:00 - 9:50 PM	KLR211	114
10021	QM-261	1	WED, 8:00 - 8:50 AM	KLR200	114

Figure 1 / Rajah 1

- (a) Determine primary key for each table. **[3M]**
Tentukan kunci utama setiap jadual
- (b) Determine foreign keys for these tables. **[3M]**
Tentukan kunci asing untuk jadual ini.
- (c) Write suitable command to create a new table consisting of class code, student number, class room and class time. **[4M]**
Tulis perintah yang bersesuaian untuk membina sebuah table baru yang terdiri dariada class code, student number, class room dan class time.

SECTION D / SEKSYEN D
CASE STUDY: [20 MARKS] / KAJIAN KES [20 MARKAH]
Answer all the following questions. / Jawab semua soalan berikut.

QUESTION 1 / SOALAN 1

Draw an Entity Relationship (ER) Diagram based on the following scenario.

[9M]

Lukis Rajah Hubungan Entiti berdasarkan senario berikut.

Cuplicious Bakery sells various bakery products. These products are grouped into several product groups. Key products for product is pro_code, and the key for product group is pro_group_code. Based on customer invoice, the additional attributes for product are pro_desc, pro_flavour and unit_price. The customer sends orders for a product. The key for order is order_code and for other attributes are order_date and quantity. The customer can place any numbers of orders or may not place any order at all. Each order is made by only one customer. The key for customer is cust_code. Other attributes are cust_name and cust_address. Each customer order consists of at least one product.

Cuplicious Bakery menjual beberapa jenis produk bakeri Produk – produk ini dibahagikan kepada beberapa kumpulan. Kekunci bagi produk adalah pro_code dan kekunci bagi product_group adalah pro_group_code. Berdasarkan kepada invois pelanggan, atribut tambahan bagi produk adalah pro_desc, Pro_flavour dan unit_price. Pelanggan menghantar tempahan bagi produk. Kekunci bagi langganan adalah order_code. Atribut – atribut lain adalah order_date dan quantity. Pelanggan boleh membuat tempahan atau tidak membuat tempahan. Setiap tempahan hanya boleh dibuat oleh seorang pelanggan. Kekunci bagi pelanggan adalah cust_code. Atribut – atribut lain adalah cust_name, cust_address. Setiap tempahan pelanggan mempunyai sekurang – kurangnya satu produk.

QUESTION 2 / SOALAN 2

```
STUDENT (sid, sname, sphone, fee, sstate, advisor, courseID)
COURSE (courseID, courseName, deptID)
DEPARTMENT (deptID, deptName)
```

By using SQL statement;

Dengan menggunakan pernyataan SQL;

- (a) Create table `STUDENT` according to the relation schema. Specify the data type for each attribute wisely. **[3M]**
Bina jadual `STUDENT` berdasarkan kepada skema hubungan. Nyatakan jenis data bagi setiap atribut.
- (b) List all the students from Terengganu. **[3M]**
Senaraikan semua pelajar dari Terengganu.
- (c) Display `courseID` and `courseName` offered by FTMK. **[2M]**
Paparkan `courseID` dan `courseName` yang ditawarkan oleh FTMK.
- (d) Count the number of student whose advisor is Liyana. **[3M]**
Kira bilangan pelajar di bawah seliaan Liyana.

END OF QUESTIONS / SOALAN TAMAT