DIPLOMA IN DATA MANAGEMENT AND ANALYTICS (DDMA)

LEVEL II

DATABASES

MONDAY: 1 December 2025. Morning Paper. **Time Allowed: 3 hours.**

This paper consists of two (2) sections. SECTION I has twenty (20) short response questions of two (2) marks each. SECTION II has three (3) practical questions of sixty (60) marks. Answer ALL questions. Marks allocated to each question are indicated in the question.

Required Resources:

- **Ms-Access 2016**
- **SQL Server Management Studio**

SECTION I (40 MARKS)

1. In a relational database, a single entry that contains a set of related attribute values in a table represents which fundamental concept? (2 marks)

2. A database administrator monitors response times and resource usage to ensure smooth system performance. Which feature of a database monitoring tool is responsible for tracking query execution times, CPU usage, memory usage and disk I/O? (2 marks)

3. Mary, an SQL developer, wants to identify performance bottlenecks and receive expert tuning recommendations. Which tool offers both performance analysis and optimisation advice? (2 marks)

4. A data analyst aggregates sales data by region but wants to filter only those regions with total sales above a certain threshold. Which SQL clause allows filtering of groups after aggregation? (2 marks)

5. A user combines customer and order tables and wants to retrieve only the rows that have matching entries in both tables. Which type of SQL join returns all matching rows from the two tables? (2 marks)

6. You have been asked to follow a set of principles to ensure data is organised efficiently and relationships are maintained correctly. Which rule set defines the principles of a relational Database Management System (DBMS)? (2 marks)

7. A database designer wants to eliminate repeating groups from a table to ensure each column contains only atomic values. Which normal form in database normalisation achieves this? (2 marks)

8. A user needs to create tables, define columns and set constraints for a new database. Which Database Management System (DBMS) language is used to define the structure of a database? (2 marks)

9. John an intern wanted to measure the number of transactions a system can handle each second to evaluate performance capacity. Which database monitoring metric tracks this? (2 marks)

10. You are required to finalise a database and specific details such as file organisation, indexes and storage structures. Which stage of database design focuses on defining these storage details? (2 marks)

11. A system administrator wants to ensure that every foreign key value in a table corresponds to an existing primary key value in another table. Which integrity constraint enforces this rule? (2 marks)

12. A cashier at a local supermarket wants to calculate total sales, average revenue and maximum order value from a set of rows. Which SQL functions perform calculations on a set of rows and return a single summary value? (2 marks)

13. Your immediate supervisor wants to filter records by combining multiple conditions in a query to retrieve specific data. Which SQL operators are used to combine or manipulate conditions in queries? (2 marks)

14. An employee at a hospital needs to back up only the changes made since the last full backup to save time and storage. Which type of database backup captures only these changes? (2 marks)

15. Josephine Muema created a view based directly on a single table without including any calculated fields or aggregations. Which type of database view is this? (2 marks)

16. Assuming you want to enhance query performance on a large table, which data structure can be used to retrieve data more efficiently? (2 marks)

17. The SQL statement below changes the salary of an employee on the Employees table:
```
UPDATE Employees
SET Salary = 60000
WHERE EmployeeID = 101;
```
Which SQL clause is used in this statement to modify existing data in a table? (2 marks)

18. A data modeler is analysing a table and notices that certain attributes can determine other attributes, but removing any attribute from this set would break that determination. What type of dependency is this describing? (2 marks)

19. A technical trainer explains an attribute in a database table that can be divided into smaller parts, each carrying its own independent meaning. What type of attribute is this? (2 marks)

20. While designing an Entity-Relationship Diagram (ERD), a developer needs to define the number of instances of one entity that can be associated with instances of another entity. Which ERD concept describes this relationship constraint? (2 marks)

SECTION II (60 MARKS)

21. Create a word processing document named "Question 21" and use the word processor document to save your answers to questions (a) and (b). Capture and present screenshots demonstrating how each task is performed.

(a) Write the SQL statements that will create and insert data into the following tables: (10 marks)

Course table

Studentcsecode	Studentcsetitle
CN3456	Computer networks
DB009	Database programming
SE6789	Software engineering

Student table

Studentnumber	Studentfname	Studentlname	Studentcsecode
CPL23456	Vincent	Mwaura	CN3456
CPL23645	Fred	Ochieng	CN3456
CPL45676	Hellen	Moraa	DB009
CPL89546	Fatuma	Mohamed	SE6789

Grade table

Studentnumber		Modulecode	Gradepoint
CPL23456	...	MOD003	53
CPL23645	...	MOD001	61
CPL23645	...	MOD002	48
CPL89546	...	MOD004	54

(b) Write the SQL statements to perform the following:

(i) To display all records where the grade point is between 50 and 60. (3 marks)

(ii) To display the student number, first name, Module code and course title for all students whose course code is "CN3456". Organise the result in descending order of module code. (3 marks)

(iii) Write an SQL statement to add a new column called "Semester" of varchar data type and data size 10 into the Course table and populate it with data such as SEM1 and SEM2. (4 marks)

Save "Question 21" document and upload. **(Total: 20 marks)**

22. Create a word processing document named "Question 22" and use the word processor document to save your answers to questions (a) to (d). Capture and present screenshots demonstrating how each task is performed.

(a) Using Microsoft Access application, create a database called "Hospital" and within the database, create and insert data in Doctor and Patient tables shown below. (10 marks)

Doctor

DoctorID	PatientNumber	DoctorSalary
D7689	W435	256000
D4354	R768	276000
D4578	R342	230000
D3423	W435	176000
D3456	W435	165000
D2345	R908	187000

Patient

PatientNumber	Patientlastname	PatientWard
R768	Anita	Ward 2
R342	Moraa	Ward 13
W435	Onyango	Ward 4
P786	Njeri	Ward 5
Y546	Kyalo	Ward 6
R908	Ogwel	Ward 17

(b) Display the relationship between the two tables. (3 marks)

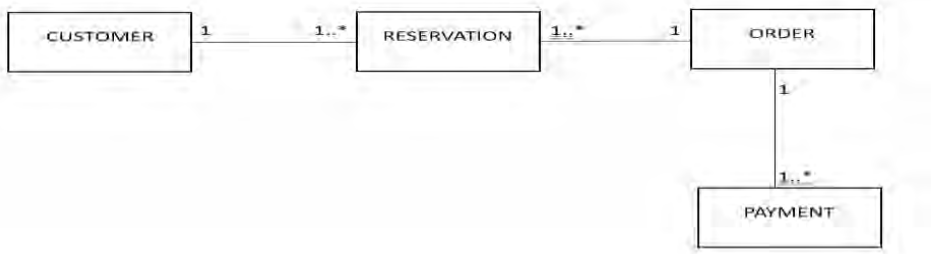
(c) Using Ms Access, display the DoctorID, Patient last name and patient ward for all patients whose number is W435. (4 marks)

(d) Create a form in Microsoft Access that allows users to enter and view doctor details namely DoctorID, Patient number and Doctor Salary. (3 marks)

Save "Question 22" document and upload. **(Total: 20 marks)**

23. Create a word processing document named "Question 23" and use the word processor document to save your answers to questions (a) and (b). Capture and present screenshots demonstrating how each task is performed.

(a) Use the entity relationship diagram below to answer the questions that follow:



(i) Derive a relational schema from the ERD provided, showing the primary keys (PK) and foreign keys (FK). (6 marks)

(ii) If a customer cancels their reservation, what should happen to the associated Order and Payment records? (3 marks)

(b) The following attributes are for an unnormalised form; student number, student name, student course code, student course name, lecturer ID, lecturer name and awarded grade.

(i) Normalise the data to the third normal form. (6 marks)

(ii) From the third normal form tables in part (i), draw a data dictionary. (5 marks)

Save "Question 23" document and upload. **(Total: 20 marks)**

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DIPLOMA IN DATA MANAGEMENT AND ANALYTICS (DDMA)

LEVEL II

DATABASES

TUESDAY: 22 April 2025. Morning Paper. **Time Allowed: 3 hours.**

Answer ALL questions. This paper has two (2) sections. SECTION I has twenty (20) short response questions of two (2) marks each. SECTION II has three (3) practical questions of sixty (60) marks. Marks allocated to each question are indicated in the question.

Required Resources:

- **SQL Server Management Studio**
- **Ms. Access 2016**

SECTION I (40 MARKS)

1. The SQL data type which is an integer that can be 0, 1 or null is known as _____. (2 marks)

2. The database manipulation language command that adds new records to tables or views is referred to as _____. (2 marks)

3. The database characteristic that enables database users to change tables, views or other database structures without altering how users interact with the data is referred to as _____. (2 marks)

4. The database structure that is optimised for online queries and data warehousing tools is known as _____. (2 marks)

5. In a relational database, which constraints are used to constrain the value of a single column? (2 marks)

6. Which is the database transaction control language (DCL) command that is used to make changes in the database? (2 marks)

7. The type of database dependency that describes a situation where a non-key column is functionally dependent on another non-key column, which is in turn dependent on the primary key is referred to as _____. (2 marks)

8. An SQL _____ command modifies existing records in a table, with the ability to specify which records to change using the WHERE clause. (2 marks)

9. The comprehensive analysis of various database metrics to guarantee smooth operation of the database is known as _____. (2 marks)

10. The concurrency control problem that occurs when two or more read operations of the same transaction read different values of the same variable is referred to as _____. (2 marks)

11. The relational integrity constraint which ensures that each record in a database table is unique is referred to as _____. (2 marks)

12. The SQL clause that is used to sort the result set in ascending or descending order is known as _____. (2 marks)

13. The type of database relationship where each record of the first table can relate to any records or no records in the second table and each record of the second table can relate to more than one record of the first table is _____ (2 marks)

14. According to Codd's rules for relational database systems, which rule states that OLAP tool should be capable of applying its own logical structure to access heterogeneous sources of data and perform any conversions necessary to present a coherent view to the user? (2 marks)

15. A collection of names, definitions and attributes about data elements that are being used or captured in a database, information system or part of a research project is known as _____. (2 marks)

16. Which is the SQL clause used to combine rows from two or more tables, based on a related column between them? (2 marks)

17. Which type of database attribute is non-divisible and cannot be categorised or further sub-divided? (2 marks)

18. The irregularity or inconsistency in a database that can lead to issues with data processing, analysis and interpretation is referred to as _____. (2 marks)

19. The database transaction characteristic which states that the changes in the database should persist after successful completion of a transaction is called _____. (2 marks)

20. The number of entity types that are associated with a relationship is known as _____. (2 marks)

SECTION II (60 MARKS)

21. Create a word processing document named "Question 21" and use the word processor document to save your answers to questions (a) to (e).

(a) Using SQL statements, create the Patient and Doctor tables in a "Hospital" database. (5 marks)

Patient table

Patient Number	First name	Last name	Gender	Doctor ID
LMS001	Vincent	Mwaura	Male	D00201
LMS002	Joseph	Ochieng	Male	D00502
LMS003	Alice	Maina	Female	D00304
LMS004	Eunice	Mwende	Female	D00201
LMS006	Anita	Moraa	Female	D00201

Doctor table

Doctor ID	First name	Phone number	Specialisation
D00201	Boaz	0712345346	Surgeon
D00304	Victor	0734123456	Cardiologist
D00502	Nancy	0787123456	Dentist
D00876	Killion	0765000000	Dermatologist

(b) Using SQL statements, insert data into the created tables. (5 marks)

(c) Write the SQL query that will display the patient number, patient last name, doctor first name and doctor specialisation for all patients whose Doctor code is D00201. (4 marks)

(d) In the created tables, state the primary and foreign attributes. (3 marks)

(e) Write the SQL statement that will insert a new column into the patient table called treatment cost. (3 marks)

Capture screenshots to demonstrate how you have performed the above task.
Save "Question 21" document and upload. **(Total: 20 marks)**

22. Create a word processing document named "Question 22" and use the word processor document to save your answers to questions (a) and (c).

(a) The following attributes are for unnormalised database schema. Assuming a composite primary key, normalise the data to first, second and the third normal forms. (8 marks)

InstructorID, InstructorFname, InstructorLname, Specialisation, InstructorPhone, MemberID, Memberfname,
Memberlname, Memberphone, MemberDOB, MembershipNo, Membershiptype, Membershipcost, ManagerID, Managerfname, Managerlname, Managerphone, Manageremail, Paymentcode, Paymentdate, Paymentamount, Paymentstatus

Instructor (InstructorID, InstructorFname, InstructorLname, Specialisation, InstructorPhone)
Member (MemberID, Memberfname, Memberlname, Memberphone, MemberDOB)
Manager (ManagerID, Managerfname, Managerlname, Managerphone, Manageremail)
Payment (Paymentcode, Paymentmode, Paymentdate, Paymentamount, Paymentstatus)
Membership (MembershipNo, Membershiptype, Membershipcost)

(b) Generate the entity relationship diagram (ERD) using appropriate notation to show the relationship between the tables derived in (a) above. (6 marks)

(c) Prepare a data dictionary for the tables and specify all the constraints. (6 marks)

Save "Question 22" document and upload. **(Total: 20 marks)**

23. Create a word processing document named "Question 23" and use the word processor document to save your answers to questions (a) to (d).

(a) Using Ms. Access application, create a database called 'TENANCY'. Within the 'TENANCY' database, create and insert data into the following tables: (10 marks)

FAULT

Fault No	Fault name
3	Broken window
2	Faulty computer
4	Broken door

TENANTBANK

Tenant bank code	Tenant bank name
E2345	ABC bank
C3456	XYZ bank
CB2376	ADC bank

TENANT

Tenant ID	Tenant First name	Tenant last name	Tenant phone number	Fault no	Tenant Bank code
3456	Vincent	Kyalo	0715675678	4	C3456
8765	Hellen	Moraa	0733909900	4	CB2376
6754	Alice	Wambui	0786988899	3	E2345
4567	Victor	Mwangi	0734567876	2	C3456

(b) Create a relationship between the tables in the TENANCY database. (2 marks)

(c) Using the Ms Access query design tool, display the tenant identification, tenant bank name, tenant last name, fault name and tenant bank code for all tenants whose tenant bank code is C3456 or fault number is 4. (4 marks)

(d) Write the Ms access query to list the tenant identification tenant last name and tenant phone number for all tenants whose last name starts with letter "M". Display both the SQL and design views. (4 marks)

Save "Question 23" document and Upload. **(Total: 20 marks)**

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DIPLOMA IN DATA MANAGEMENT AND ANALYTICS (DDMA)

LEVEL II

DATABASES

MONDAY: 18 August 2025. Morning Paper. **Time Allowed: 3 hours.**

Answer ALL questions. This paper has two (2) sections. SECTION I has twenty (20) short response questions of two (2) marks each. SECTION II has three (3) practical questions of sixty (60) marks. Marks allocated to each question are indicated in the question.

Required Resources:
- **Ms-Access 2016**
- **SQL Server Management Studio**

SECTION I (40 MARKS)

1. Which part of DBMS is responsible for maintaining data privacy and permissions? (2 marks)

2. Which database activity involves accelerating query response, improving indexing and deploying clusters according to how they are best used to support system function and end-user experience? (2 marks)

3. Which Codd's rule for relational DBMS ensures that each data item can be uniquely identified using a combination of table name, primary key and column name? (2 marks)

4. In SQL, what is the name of a query nested inside another query and often used to return data that will be used in the main query? (2 marks)

5. The database design that is used to visually represent how data objects relate to each other within a system is called _____. (2 marks)

6. Which level of abstraction represents the overall logical structure of the entire database and is independent of individual applications? (2 marks)

7. A database that is stored and accessed over the Internet is called a _____. (2 marks)

8. Which database constraint is used to enforce the uniqueness and ensures the integrity of data in a table? (2 marks)

9. The process of organising data to reduce redundancy and improve data integrity is known as _____. (2 marks)

10. Which critical component of SQL is used to manage changes made by Data Manipulation Language (DML) statements and to ensure data integrity? (2 marks)

11. In database normalisation process, what is the dependency of a non-key attribute on another non-key attribute? (2 marks)

12. Which SQL command is used to retrieve data from the database? (2 marks)

13. What is the approach to data monitoring that involves identifying and addressing data issues only after they have occurred? (2 marks)

14. The SQL syntax which returns the product of all combinations of rows from two tables, pairing each row of the first table with every row of the second table is known as _____. (2 marks)
15. The aspect of database monitoring that ensures data remains uniform and reliable across the database called _____. (2 marks)

16. Which SQL function returns the number of rows that matches a specified criterion? (2 marks)

17. Which procedure helps in monitoring database activities, detecting anomalies and auditing user actions? (2 marks)

18. John a student undertaking Diploma in Data Management and Analytics (DDMA) was given an opportunity to work as an intern in ABC Ltd. The HR Officer requested him to update the salary of one of the employees who got a salary increment. The company's staff file is called employee, primary key is empID, employee's number is 2025001 and new salary is Sh.100,000. Write the SQL statement that John would use to update this record. (2 marks)

19. What is the name of the number of attributes in a relational database? (2 marks)

20. Name the person whose role involves designing, implementing and maintaining databases that are essential for storing, organising and retrieving data efficiently. (2 marks)

SECTION II (60 MARKS)

21. Create a word processing document named "Question 21" and use the word processor document to save your answers to questions (a) to (c).

Vision Place is a grooming salon for cats. It has several cat groomers. The customer contacts the salon to make an appointment for their cat. The customer's contact details are recorded in the system along with the name and breed of the cat (so that it can be determined whether the cat is a short-haired, medium-haired or long-haired breed so that they can be charged accordingly).

An appointment is scheduled for the cat at an agreed date and time and a member of staff is assigned to that appointment. Special notes are added to the appointment if necessary. The notes include: Cat is aggressive, use sedation or Cat has allergies.

Required:

(a) Draw an ER model (ERD) for the above scenario. (4 marks)

(b) Prepare a data dictionary for the entities in the ERD in question (a) above and populate it with a range of suitable attributes and associated meta data for each entity. (10 marks)

(c) The following table is in unnormalised form (UNF), normalise it to the second normal form (2NF). (6 marks)

Capture screenshots to demonstrate how you have performed the above task.

Save "Question 21" document and upload. **(Total: 20 marks)**

22. Create a word processing document named "Question 22" and use the word processor document to save your answers to questions (a) to (d).

(a) Using Microsoft Access application, create a database called "UNIVERSITY". Within the 'UNIVERSITY' database, create and insert data into the following tables. (10 marks)

Student

StudentID	StudentFname	StudentPhone
900	Joseph	0723456765
1024	Anne	0723437765
3456	Boaz	0754327865
8767	Hellen	0712987897

Book

Bookcode	BookAuthor	Bookprice_$
BBK456	Alice	342
CBA345	Anita	564
BBK765	James	665
BBK878	Joseph	786
BBF456	Victor	657

StudentBook

StudentID	Bookcode
900	BBK456
1024	CBA345
1024	BBK765
8767	CBA345
3456	BBF456

(b) Using Microsoft Access, display the names of students and the book codes of the books they are associated with. (4 marks)

(c) Using Microsoft Access, display all students who are not associated with any book. (3 marks)

(d) Using Microsoft Access, find the total value of books associated with each student. (3 marks)

Capture screenshots to demonstrate how you have performed the above task.

Save "Question 22" document and upload. **(Total: 20 marks)**

23. Create a word processing document named "Question 23" and use the word processor document to save your answers to questions (a) to (d).

(a) Using SQL, create and insert data as shown in the following tables. (10 marks)

Animal table

AnimalNo	Animalname	Animaltype	Animalage_years
A324	Max	Elephant	6
A456	Catoo	Dog	5
A327	Rollex	Leopard	6
A987	Bazoo	Cow	3
A345	Brunn	Zebra	4

Caretaker table

CaretakerID	Caretakername	Phoneno
C004	Joseph Onyango	0713405768
C009	Ann Ndungu	0767890987
C008	Vincent Mbugua	0723456567
C005	Kelly Mwende	0765435342
C007	Armstrong Makhulo	0745656565

CaretakerAssignment table

AssignmentID	CaretakerID	AnimalNo
1	C004	A324
3	C009	A456
6	C008	A327
8	C005	A987
9	C007	A345

(b) Write SQL statement to display the animal identification, animal name, animal age, caretaker first name and caretaker phone number for all animals aged between 5 to 6 years. Organise your result in ascending order of animal name. (5 marks)

(c) Write SQL statement that will change the animal number to A345 if the caretaker identification is C008. (3 marks)

(d) Write SQL statement which will count the number of animals that are aged 4 years and above. (2 marks)

Capture screenshots to demonstrate how you have performed the above task.

Save "Question 23" document and upload. **(Total: 20 marks)**

(2 marks)

(Total: 20 Marks)

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DIPLOMA IN DATA MANAGEMENT AND ANALYTICS (DDMA)

LEVEL II

DATABASES

MONDAY: 2 December 2024. Morning Paper. **Time Allowed: 3 hours.**

Answer ALL questions. This paper has two (2) sections. SECTION I has twenty (20) short response questions of two (2) marks each. SECTION II has three (3) practical questions of sixty (60) marks. Marks allocated to each question are indicated in the question.

Required Resources:

- **SQL Server Management Studio**
- **Ms-Access 2016**
- **XAMPP**
- **SmartDraw**

SECTION I (40 MARKS)

1. The number of attributes in a relational database is referred to as _____. (2 marks)

2. The name of a database consisting of two or more files located in different sites on different networks is called _____. (2 marks)

3. State the system of components that comprises and regulates the group of data, management and use of data. (2 marks)

4. The database language whose statements can be used to create the architecture of the required database is referred to as _____. (2 marks)

5. The database characteristic that enables database personnel to change the internal schema without having to change the conceptual schema is referred to as _____ . (2 marks)

6. Identify the fourth stage in the relational database design process. (2 marks)

7. A_____ provides a standardised method for defining and formatting database contents consistently across systems. (2 marks)

8. The _____ database level of abstraction describes how data is stored in memory. (2 marks)

9. The _____database transaction control language command is used to restore the database to its last committed state. (2 marks)

10. Which component of an entity relationship diagram does a diamond shape represent? (2 marks)

11. The Codd's rule which states that every null value in a database must be given a uniform treatment is referred to as _____. (2 marks)

12. Given the following SQL example:

```
ALTER TABLE Students
MODIFY COLUMN Phone TEXT;
```

Explain the purpose of the SQL above. (2 marks)

13. Which database SQL command can be used to give access to certain database resources? (2 marks)

14. The database performance-monitoring factor that refers to the strategies used to increase the speed and efficiency with which information is retrieved from the database is called_____. (2 marks)

15. Identify the property of a transaction which states that the result of a transaction should not be visible to others before the transaction is committed. (2 marks)

16. State the database concurrency control technique that allows transactions to work on private copies of database items and validates the transactions only at the time of commit. (2 marks)

17. What is the database performance tuning technique that involves assigning memory, CPU and disk resources for optimal performance? (2 marks)

18. Which integrity constraint states that an attribute can only link two relations if it matches the primary attribute of the parent relation? (2 marks)

19. Tamar created a table called Marks in a database called Tamar College. Write the SQL statement that she could use to delete the table and all of its data from the database. (2 marks)

20. The SQL join clause that returns all records when there is a match in either left or right tables is known as_____ (2 marks)

SECTION II (60 MARKS)

21. Create a word processing document named "Question 21". Use the word processor document to save your answers to questions (a) to (d) below.

Use the tables below to answer the questions that follow.

Staff table

Staff Number	Staff last name	Staff phone	Account Number
B004	Moraa	+254714234345	EN345455T
C5676	Mwende	+254734004309	CB989767Y
D3456	Otieno	+255735203004	CP46575659W
W4354	Musembi	+256724657768	EN345455T

Account table

Account Number	Account name	Account balance in dollars
EN345455T	Standard	3500
CP46575659W	Haba Haba	4000
CB989767Y	Special	6000

Customer table

Customer ID	Customer first name	Customer email	Staff Number
2345	James	jmmwaura@gmail.com	W4354
2356	Hellen	hlnnjeri@gmail.com	C5676
6543	Arnold	arnoline@gmail.com	W4354
4576	Alice	alcewel@gmail.com	D3456

(a) Write the SQL statements that will create and insert data into the Staff, Account and Customer tables in the "Bank" database. (9 marks)

(b) Write the SQL statement that will list the customer identification, customer email, account number, account name and staff last name for all the staff with an "e" character in their last name. Display the result table. (4 marks)

(c) Write the SQL statement that will change the staff number to "D3456" where customer first name is "Hellen". (4 marks)

(d) Write the SQL statement that will find the total value of the account balances. (3 marks)

Capture screenshots to demonstrate how you have performed the above tasks.

Save and upload "Question 21".

(Total: 20 marks)

22. Create a word processing document named "Question 22" and use the word processor document to save your answers to questions (a) and (b).

(a) Consider a university database for the scheduling of classrooms for final exams. This database could be modelled as the single entity set exam, with attributes course-name, section-number, room-number and time.

Alternatively, one or more additional entity sets could be defined, along with relationship sets to replace some of the attributes of the exam entity set namely

- **Course** with attributes *name*, *department*, and *c-number*
- **Section** with attributes *s-number* and *enrollment*, and dependent as a weak entity set on **course**
- **Room** with attributes *r-number*, *capacity*, and *building*.

Draw an entity relationship (E-R) diagram illustrating the use of all the three additional entity sets. (10 marks)

(b) Given the database schema below, prepare the data dictionary to aid in the development of the database using SQL server application (10 marks)

Department (DepartmentID, Departmentname, DepartmentFloor, LecturerID)
Course (Coursecode, Coursename, Courseduration)
Faculty (FacultyNumber, Facultyname, DepartmentID, Facultylocation)
Lecturer (LecturerID, Lecturerfirstname, Lecturerphone, Coursecode)

Save and upload "Question 22".

(Total: 20 marks)

23. Create a word processing document named "Question 23" and use the word processor document to save your answers to questions (a) to (d).

(a) Using Microsoft Access application, create a database named 'HOTEL'. Within the 'HOTEL' database, create and insert data into the following tables: (10 marks)

Cashier table

Cashier ID	Cashier First name	Cashier last name	Gender	Cashier salary
CC105	Maureen	Atieno	Female	40000
CC546	Milka	Moraa	Female	45000
CC234	Victor	Kyalo	Male	62000
CC768	Benard	Nasekeu	Male	56000

Item table

Item Number	Item name	Quantity	Unit price	Cashier ID
435	Onion	890	50	CC105
567	Tomato	1002	56	CC234
432	Watermelon	235	200	CC234
456	Pawpaw	768	250	CC768

Client table

Client ID	Client name	Client phone	Item number
DF78	XY college	0753123456	435
GG567	Mantrix limited	0754123456	456
RT345W	Mowlem traders	0725123456	435
SE8756	Henre bakery	0742123456	567

(b) Create a relationship between the tables in the HOTEL database. (2 marks)

(c) Using the Microsoft Access query design tool, display the client ID, client name, item name, unit price and cashier salary for all cashiers whose salary is greater than 50000 or items whose unit price is less than 52. (5 marks)

(d) Write the Microsoft access query to find the average salary for all male cashiers. Display both the SQL and datasheet views. (3 marks)

Save and upload "Question 23".

(Total: 20 marks)

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DIPLOMA IN DATA MANAGEMENT AND ANALYTICS (DDMA)

LEVEL II

DATABASES

MONDAY: 19 August 2024. Morning Paper. **Time Allowed: 3 hours.**

Answer ALL questions. This paper has two (2) sections. SECTION I has twenty (20) short response questions of two (2) marks each. SECTION II has three (3) practical questions of sixty (60) marks. Marks allocated to each question are indicated in the question.

Required Resources:
- **SQL Server**
- **Ms-Access**
- **XAMPP**

SECTION I (40 MARKS)

1. The database activity that involves accelerating query response, improving indexing and deploying clusters according to how they are used to support system functions and end-user experience is referred to as _____. (2 marks)

2. The database concurrency problem that occurs when a second transaction is trying to access the same row several times and reads different data each time is referred to as _____. (2 marks)

3. What is the collective name of the hardware and software tools used by the database including the processor, memory and cache controllers? (2 marks)

4. Identify the database computer language that is designed for the retrieval and management of data in a relational database? (2 marks)

5. The type of SQL join that returns all records when there is a match in either left or right table is referred to as_____. (2 marks)

6. State the feature in a database management system (DBMS) that allows requests to be used to communicate requirements to the database and get the appropriate outputs. (2 marks)

7. A virtual table in SQL whose contents are defined by a query is called a _____. (2 marks)

8. State the database activity that is used to rollback transactions and recover from crashes. (2 marks)

9. Write an SQL statement that will add in a customer table, a field name called CEmail of field length 20. (2 marks)

10. State the term that is used in databases to represent the number of times an entity or an entity set participates in a relationship set. (2 marks)

11. In concurrency control, the type of lock that exists when access to a data item is specifically reserved for the transaction that locked the object is referred to as _____. (2 marks)

12. In database management system (DBMS), what is the term used to define the capacity to change the structure of the database without affecting the application programs or user views that access the data? (2 marks)

13. The database level of abstraction that defines relationships between the data elements, the constraints on the operations that can be performed on the data is known as _____. (2 marks)

14. The type of attribute which takes up more than a single value for each entity instance is called_____. (2 marks)

15. The database structure that is optimised for online queries and data warehousing tools is referred to as _____. (2 marks)

16. Name the person that is responsible for maintaining, securing and operating databases? (2 marks)

17. Which type of database technique does not physically update the database on disk until a transaction has reached its commit point? (2 marks)

18. The group of similar kind of entities which may contain entities with attribute sharing similar values is referred to as _____. (2 marks)

19. The computer programming language that is used for adding, deleting and modifying data in a database is known as the _____. (2 marks)

20. Name the process that supports the analysis and alteration of a database relation in order to get more concise and organised data structures. (2 marks)

SECTION II (60 MARKS)

21. Create a word processing document named "Question 21" and use the word processor document to save your answers to questions (a) to (d):

(a) Using Ms-Access, create the "Mining" database given by the schema below:

Student (StudentID, StudentFname, StudentAddress, Bookcode)
Class (ClassNo, Classlocation, Classsize, LecturerID, StudentID)
Book (Bookcode, BookAuthor, Bookprice)
Lecturer (LecturerID, Lecturerunit, LecturerLname) (6 marks)

(b) Using an appropriate Ms-Access database tool, show the object definition for the book table. (3 marks)

(c) Insert the following data into the tables: (7 marks)

STUDENT

StudentID	StudentFname	StudentAddress	Bookcode
900	Joseph	P.O BOX 44	BBK456
1024	Anne	P.O BOX 26	CBA345
3456	Boaz	P.O BOX 72	BBK765

CLASS

ClassNo	Classlocation	Classsize	LecturerID	StudentID
BN34	Third floor	100	43565	1024
TC65	Second floor	130	54632	900
TM78	Third floor	150	43565	1024

BOOK

Bookcode	BookAuthor	Bookprice
BBK456	Alice Mwende	$342
CBA345	Anita Kosgey	$564
BBK765	James Kyalo	$665

LECTURER

LecturerID	Lecturerunit	LecturerLname
54632	Database	Ochieng
43565	Programming	Wanjiru
76576	Networking	Mokaya

(d) Create a query called StudentClass which will display the student identification, student first name and class size for all students whose class is located at the third floor. Arrange the results in descending order of class size. (4 marks)

Capture the screenshots to show how you have performed the above tasks.

Save Question 21 and Upload. **(Total: 20 marks)**

22. Create a word processing document named "Question 22". Use the word processor document to save your answers to questions (a) to (d) below:

(a) Using SQL statements, create the doctor, patient and DoctorPatient tables given below in a "Hospital" database. (6 marks)

Doctor table

DoctorID	Doctor first name	Doctor Salary	Doctor Ward
123	Victor	$5678	Ward 4
132	Hellen	$4365	Ward 3
125	Moses	$7654	Ward 4

Patient table

PatientNo	Patient last name	Patient Age	Gender
KNH234	Mwaura	25	Male
KNH567	Atieno	43	Female
KNH342	Moraa	52	Female

DoctorPatient table

PatientNo	DoctorID
KNH234	123
KNH567	123
KNH234	132

(b) Using SQL statements, insert data given into the created tables. (5 marks)

(c) Write the SQL statement that will list the DoctorID, Doctor first name, Patient No. and Patient age. The statement should display all doctors whose salary is above five thousand dollars. Arrange the results in ascending order of doctor first name. Display the result table. (6 marks)

(d) Write the SQL statement that will find the average salary for all doctors who work in ward 4. (3 marks)

Capture screenshots to show how you have performed the above task.

Save Question 22 and Upload. **(Total: 20 marks)**

23. Create a word processing document named "Question 23" and use the word processor document to save your answers to questions (a) to (d) below:

(a) Attributes below are for the unnormalised form. Assuming a composite primary key of module code and student number, produce the first, second and the third normal forms.

Student number, student name, student course code, student course title, module code, module title, result code, result name, grade point. (8 marks)

(b) Draw the entity relationship diagram (ERD) using appropriate notation to show the relationship between the tables derived in (a) above. (5 marks)

(c) Prepare a data dictionary for the tables and specify all the constraints. (7 marks)

Capture screenshots to demonstrate how you have performed the above task.

Save Question 23 and Upload. **(Total: 20 marks)**

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DIPLOMA IN DATA MANAGEMENT AND ANALYTICS (DDMA)

LEVEL II

DATABASES

MONDAY: 22 April 2024. Morning Paper. **Time Allowed: 3 hours.**

Answer ALL questions. This paper has two (2) sections. SECTION I has twenty (20) short response questions of two (2) marks each. SECTION II has three (3) practical questions of sixty (60) marks. Marks allocated to each question are shown at the end of the question.

Required Resources:

- **SQL Server**
- **Ms-Access 2016**
- **XAMPP**

SECTION I (40 MARKS)

1. The process of intentionally adding redundancy to a database for performance optimisation is called_____. (2 marks)

2. The older logical database model that organises data in a tree like structure is known as _____. (2 marks)

3. The division of large database tables into smaller, more manageable parts for improved performance and maintenance is called _____. (2 marks)

4. A single row of a table which contains a single record is referred to as_____. (2 marks)

5. The type of data independence that involves changing the conceptual schema without having to change the external schema is referred to as _____. (2 marks)

6. The techniques used to manage simultaneous access to data in a database to prevent inconsistencies and conflicts is known as _____. (2 marks)

7. State the structured query language command used to delete a relation permanently from the database. (2 marks)

8. A distributed ledger technology that stores transactions across multiple nodes in a secure and immutable form is known as _____. (2 marks)

9. _____ is the type of database relationship where each record of the first table can relate to any records or no records in the second table and each record of the second table can relate to more than one record of the first table. (2 marks)

10. The relational integrity constraint which states that every attribute is bound to have a specific range of values is called _____. (2 marks)

11. Write an SQL statements to rename attribute “name” to “FirstName” from table Students using SQL commands. (2 marks)

12. A huge collection of the information or data accumulated from several different sources is known as _____. (2 marks)

13. In database normalisation, which normal form eliminates transitive dependencies? (2 marks)

14. Which database terminology is used to refer to the process of creating and maintaining redundant copies of databases across multiple servers or locations to improve availability, disaster recovery and data distribution? (2 marks)

15. The process of copying and synchronising data across multiple database instances for redundancy and availability is known as _____. (2 marks)

16. _____is a top-down approach in which the entity's higher level can be divided into two lower sub-entities. (2 marks)

17. A constraint that specifies that every instance of one entity type must be associated with an instance of another entity type is known as _____. (2 marks)

18. Monitoring and recording database activities, such as logins, queries and modifications for security, compliance and troubleshooting purposes is known as _____. (2 marks)

19. State the distributed algorithm which is used to ensure the atomicity of transactions across multiple databases. (2 marks)

20. _____is commonly used to define the overall design of the database. (2 marks)

SECTION II (60 MARKS)

21. Create a word processing document named "Question 21". Use the word processor document to save your answers.

Use the tables provided below to answer the questions (a) to (e).

(a) Using the tables provided below, write the SQL statements to create a database called **"College**" with two tables "Student" and "Course". (5 marks)

Student table

Student Number	First name	Last name	Student course code
FA01	James	Mwaura	DB201
FA03	Alice	Ochieng	SS102
GA01	Allan	Makokha	NT203
RD34	Eunice	Njambi	DB201

Course table

Student course code	Student course name
DB201	Database
SS102	Programming
NT203	Networks

(b) Using SQL statements, insert the data given into the created tables. (5 marks)

(c) Write the SQL query that will display the student number, student last name and student course name for all students whose course code is DB201. Display the result table. (4 marks)

(d) In each of the two tables, state the primary and foreign attributes. (3 marks)

(e) Write the SQL statement that will insert a new column into the course table called "course cost". (3 marks)

Save "Question 21" and upload. **(Total: 20 marks)**

22. Create a word processing document named "Question 22" and use the word processor document to save your answers to questions (a) to (d) below.

The table below illustrates how doctors prescribe medicine to patients at a hospital in Kenya:

Patient Number	Patient Name	Doctor ID	Doctor Phone	Prescription Date	Patient Account Code	Patient Account Name
E546	Joseph Ochieng	T695	0711000000	23-05-2021	7655	Joseph
E564	Alphine Mwende	T895	0723000000	12-05-2021	8695	Alphine
E546	Diana Njeri	Y985	0771000000	20-05-2021	3254	Diana
Z410	Rose Nandwa	T695	0731000000	12-05-2021	4785	Rose

Required:

(a) State why neither patient number nor doctor ID can be considered the unique attributes of the table. (2 marks)

(b) Assuming that the combination of patient number and the doctor ID will uniquely identify the records in the relation, normalise the relation to the third normal form and list the tables after normalisation. (8 marks)

(c) Draw the entity relationship diagram (ERD) using appropriate notation to show the relationship between the tables derived in (b) above. (6 marks)

(d) Prepare a data dictionary for the tables. (4 marks)

Save "Question 22" and upload. **(Total: 20 marks)**

23. Create a word processing document named "Question 23" and use the word processor document to save your answers to questions (a) to (d).

(a) Using Ms-Access, create the database given by the schema below. (10 marks)

Tenant (TenantID, TenantFname, TenantPhone, Tenantbankcode, PropertyNo)
Property (PropertyNo, Propertyname, Propertystatus, PropertyTaxID)
Bank (Tenantbankcode, TenantBankValue)
Tax (PropertyTaxID, PropertyTaxvalue)

(b) Capture the screen showing the entity relationship diagram after creating the tables. (2 marks)

(c) Create a tabular form for the property table. (2 marks)

(d) Use SQL to create a view for the table shown below. The view should show the house number and the price for all houses from the city of Nairobi. (6 marks)

House number	Address	City	Price
AR120	P.O BOX 44434	Nakuru	Ksh 546,000
WR123	P.O BOX 265432	Mombasa	Ksh 800,000
TY124	P.O BOX 986	Nairobi	Ksh 666,000
XT132	P.O BOX 3342	Nairobi	Ksh 701,000

Save "Question 23" and upload. **(Total: 20 marks)**

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DIPLOMA IN DATA MANAGEMENT AND ANALYTICS (DDMA)

LEVEL II

DATABASES

MONDAY: 4 December 2023. Morning Paper. **Time Allowed: 3 hours.**

Answer ALL questions. This paper has two (2) sections. SECTION I has twenty (20) short response questions of two (2) marks each. SECTION II has three (3) practical questions of sixty (60) marks. Marks allocated to each question are shown at the end of the question.

Required Resources:

- **SQL**
- **Ms-Access 2016**
- **XAMPP**

SECTION I (40 MARKS)

1. The computer software that supports the creation of the database, reading of data from the database and editing of data in the database is referred to as: (2 marks)

2. In normalization, the normal form which ensures that no non-key attribute determines another attribute in a table is referred to as? (2 marks)

3. The type of database design where the database designer is required to define the data elements and the relationships between them is referred to as: (2 marks)

4. According to Codd's rules for relational database systems, which database feature must show the updates of the base tables? (2 marks)

5. The relational integrity constraint which ensures that there are no null values in the key attribute is known as: (2 marks)

6. The DBMS term that describes the set of definitions in a relation, constraints and deviation rules is referred to as: (2 marks)

7. The type of entity that has a primary key attribute which uniquely identifies each entity is referred to as: (2 marks)

8. The database language that allows the database administrator to change access permissions in a database is referred to as: (2 marks)

9. The stage in database design that involves the determination of the volume of data to be stored and the type of database required is referred to as: (2 marks)

10. In the SQL statement shown below, explain the result of the WHERE clause.

```
SELECT Employee.firstname, Employee.Lastname, Department.departmentname
FROM Employee INNER JOIN Department ON Employee.departmentno = Department.departmentno
WHERE Employee.firstname LIKE 'n%';
```
(2 marks)

11. The SQL data types such as int, tinyint, bigint, float and real can collectively be referred to as: (2 marks)

12. Database objects such as table, index or view can be deleted using _____ SQL command? (2 marks)

13. State the SQL aggregate function used to find the mean value of a numeric column. (2 marks)

14. The SQL join clause that will return all records from the right table and the matched records from the left table is called: (2 marks)

15. The type of database monitoring where problems affecting the system performance are reported in real time is referred to as: (2 marks)

16. The database concurrency control problem which occurs when a transaction reads a variable once but when it tries to read the same variable again, a "variable does not exist" error occurs is referred to as: (2 marks)

17. In SQL, the query that is created within the main query is referred to as: (2 marks)

18. The term which best describes how the database engine continuously monitors the workload on the database is referred to as: (2 marks)

19. The type of database index which facilitates the collection of data from one place and records it at another place is referred to as: (2 marks)

20. State two features provided by SQL server to support the tracking of changes to data in a database: (2 marks)

SECTION II (60 MARKS)

21. (a) Create a database called "question 21". In the database you have created, create a Books table with the following attributes;

Books (BookID, Title (50), Description (30), Category, NCopies) (3 marks)

(b) Create a Books form and use it to enter the records shown in Table 1 below: (5 marks)

Table 1

ID	Title	Description	Category	No of copies
1	Word	Hard cover	2	2
2	Computers	Hard cover	4	2
3	Access	Paperback	2	2
4	Art	Hard cover	1	1
5	Science	Paperback	3	1

(c) Given the records in Table 2 below, create a suitable table to capture the details: (3 marks)

Table 2

ID	Book_ID	ISBN	Version
1	1	1234	1
2	1	1235	2
3	2	1236	1
4	2	1237	3
5	3	1238	2
6	3	1239	3
7	4	1241	4
8	5	1242	7

(d) (i) Create a relationship between "Table 1 and Table 2". (2 marks)

(ii) Create a query called Book category to display all books and their ISBN which belong to a given category such as Category 2. (3 marks)

(iii) Create a Book Details report showing book details and ISBN. Include date at the top and page number at the bottom. (4 marks)

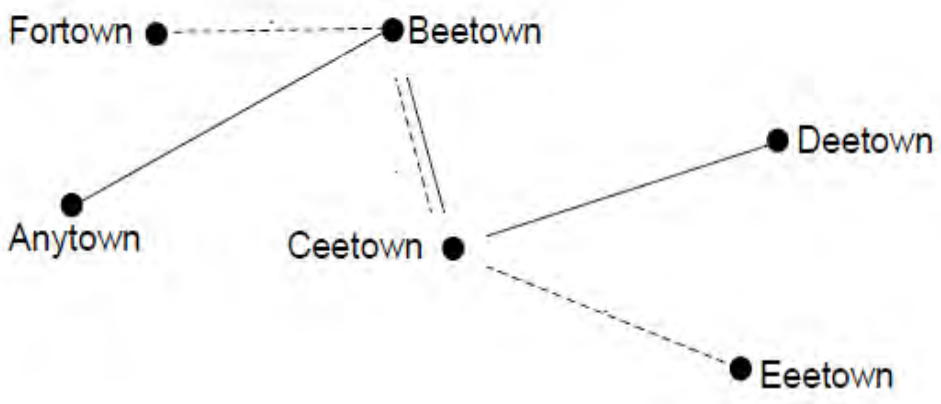
Save question 21 database and upload.

(Total: 20 marks)

22. Create a word processing document named "Question 22" and use it to save your answers to questions (a) to (d).

NetGo Sacco operates a transport business and has many commuter buses.

The diagram below shows two of its routes:



1. Route Number 1 passes through towns Anytown (A), Beetown (B), Ceetown(C) and Deetown (D).
2. Route Number 2 passes through Fortown(F), Beetown(B), Ceetown(C) and Eeetown(E).
3. One route is covered by many busses.
4. Different stages have many drivers.
5. A route consists of different stages.
6. Different stages connect to different towns.

Required:
Using the information given above:

(a) Identify five entities. (5 marks)

(b) For each entity, indicate an attribute suitable as a primary key. (5 marks)

(c) Draw an entity relationship diagram (ERD) for NetGo Sacco. (5 marks)

(d) NetGo Sacco has an attendance monitoring system for staff. The table below shows some of the attendance data for three people.

Attendance									
ID	Surname	Department	Phone Ext	Wk No	Att (hrs)	Wk No	Att (hrs)	Wk No	Att (hrs)
2311	Muteti	Accounts	215	1	32	2	56	3	42
2400	Njeri	Accounts	215	1	12	2	32	3	40
3625	Omolo	Sales	560	1	23	2	35	3	35

(i) Justify why the data in the table is not in a normalised form. (2 marks)

(ii) Convert the table above into its 1st Normal Form (1NF). (3 marks)

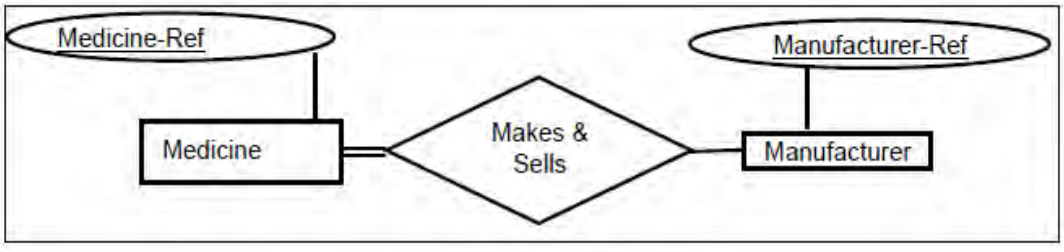
Save question 22 document and upload. **(Total: 20 marks)**

23. Create a word processing document named "Question 23". Use the word processor document to save your answers to questions (a) to (c) below:

A hospital intends to cut costs by purchasing non-generic medicines direct from manufacturers rather than from a wholesaler. The pharmaceutical company that invented a drug has exclusive rights for the first ten years. After that other companies may produce a generic equivalent.

The medicine relation already exists in the database and if necessary, further attributes will be added to this relation. The relation manufacturer will be added to the database. The purchasing application will also use a view of the database.

(a) The Entity Relation Diagram (ERD) shown below refers to the purchasing of non-generic medicines.



For each of the above entities:

(i) Suggest a suitable set of attributes and their attribute types. (6 marks)

(ii) Specify any foreign keys. (2 marks)

(b) Using the attributes suggested in (a) above:

(i) Create medicine and Manufacturer tables. (4 marks)

(ii) Write an SQL statement to append one record in each of the tables created in (b) (i) above. (4 marks)

(c) Create a data dictionary for the two tables and capture the first two pages of this data dictionary. (4 marks)

Save question 23 document and upload

(Total: 20 marks)

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DIPLOMA IN DATA MANAGEMENT AND ANALYTICS (DDMA)

LEVEL II

DATABASES

MONDAY: 21 August 2023. Morning Paper. **Time Allowed: 3 hours.**

Answer ALL questions. This paper has two (2) sections. SECTION I has twenty (20) short response questions of two (2) marks each. SECTION II has three (3) practical questions of sixty (60) marks. Marks allocated to each question are shown at the end of the question.

Required Resources:
- **SQL**
- **Ms Access 2016**
- **XAMPP**

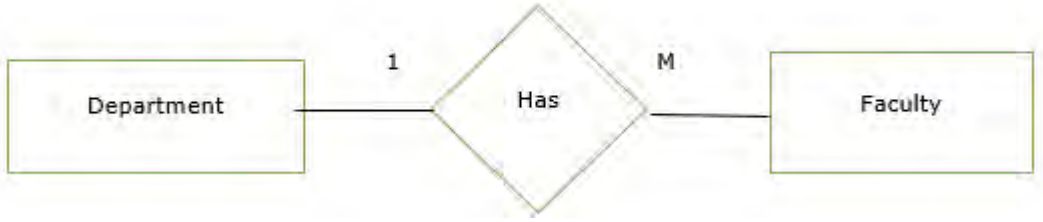
SECTION I (40 MARKS)

1. What is the name of the structure of a database supported by a relational database management system (RDBMS). (2 marks)

2. The property of database transactions that ensures that a set of database operations, either all occur or none occur is known as? (2 marks)

3. The DBMS Language used to create and modify the structure of objects in a database using predefined commands and a specific syntax is known as? (2 marks)

4. The diagram below shows two entities and how they relate:



Which type of a relationship is illustrated by the diagram above? (2 marks)

5. A characteristic of a database approach which refers to the ability of a database to handle a large amount of data and users without performance degradation is known as? (2 marks)

6. Correct the error (s) in the following SQL statement. (2 marks)

```
SELECT Name, location,
FROM  EMPLOYEE,
WHERE Location = Nairobi;
```

7. The phase in database development life cycle (DDLC) which finds out the type of a database that is required for the business organisation is known as? (2 marks)

8. The group of phases associated with the extraction of data from the database is known as? (2 marks)

9. The process of taking a normalised schema and making it non-normalised to be used by designers to tune the performance of systems so as to support time-critical operations is called? (2 marks)

10. What is the name of a statistical tool that summarises and reorganises selected columns and rows of data in a database table to obtain a desired report? (2 marks)

11. In a relational database management, the concept that specifies the relationship between two sets of attributes where one attribute determines the value of another attribute is known as? (2 marks)

12. The various ways that database administrators can ensure databases are running as efficiently as possible is referred to as? (2 marks)

13. A cartesian join also known as cross join returns the Cartesian product of the sets of records from two or more joined tables. Show the basic SQL syntax of a cartesian join. (2 marks)

14. Using an appropriate aggregate function, write a basic SQL statement to find the average salary of employees in a table called "employees". (2 marks)

15. What is the name of a subset of a database which is based on a query that runs on one or more database tables? (2 marks)

16. The practice of tracking database metrics so that performance issues are identified early before they cause major problems is known as? (2 marks)

17. What is defined as the iterative process of enhancing the performance of a query in terms of execution time, the number of disk accesses, and many more cost measuring criteria? (2 marks)

18. A concept in database management systems (DBMS) that identifies a set of standard properties used to guarantee the reliability of a given database is known as? (2 marks)

19. In a DBMS, the component used to define an instance in a column which holds any information relative to the entity is known as? (2 marks)

20. The performance monitoring tool which offers agentless monitoring of wait statistics, such as SQL wait conditions, SQL wait times, I/O stall times and deadlocks is called? (2 marks)

SECTION II (60 MARKS)

21. (a) (i) Create a database called question 21. In the database you have created, create a Books table with the following attributes;
Books(BookID, Title(50), Description(30), Category, NCopies) (3 marks)

(ii) Create a Books form and use it to enter the records shown in Table 1 below.

Table 1

ID	Title	Description	Category	No of copies
1	Word	Hard cover	2	2
2	Computers	Hard cover	4	2
3	Access	Paperback	2	2
4	Art	Hard cover	1	1
5	Science	Paperback	3	1

(5 marks)

(b) Given the records in Table 2 below, create a suitable table to capture the details.

Table 2

ID	Book_ID	ISBN	Version
1	1	1234	1
2	1	1235	2
3	2	1236	1
4	2	1237	3
5	3	1238	2
6	3	1239	3
7	4	1241	4
8	5	1242	7

(i) Create a relationship between the two tables created in (a) and (b) above. (2 marks)

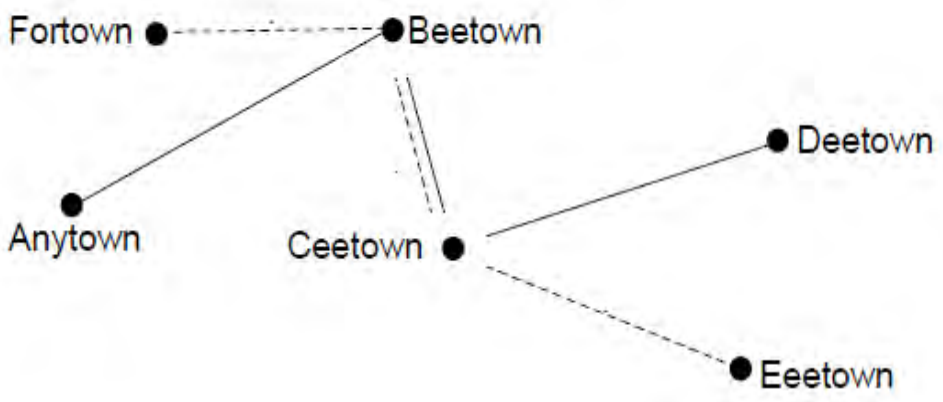
(ii) Create a query called Book category to display all books and their ISBN which belong to a given category such as Category 2. (3 marks)

(iii) Create a Book Details report showing book details and ISBN. Include date at the top and page number at the bottom. (4 marks)

Save question 21 database and upload. **(Total: 20 marks)**

22. Create a word processing document named "Question 22" and use it to save your answers to questions (a) to (d).

NetGo Sacco operates a transport business and has many commuter buses.
The diagram below shows two of its routes.



1. Route Number 1 passes through towns Anytown (A), Beetown (B), Ceetown(C) and Deetown (D).
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Required:
Using the information given above:

(a) Identify five entities. (5 marks)

(b) For each entity, indicate an attribute suitable as a primary key. (5 marks)

(c) Draw an entity relationship diagram (ERD) for NetGo Sacco. (5 marks)

(d) NetGo Sacco has an attendance monitoring system for staff. The table below shows some of the attendance data for three people.

Attendance									
ID	Surname	Department	Phone Ext	Wk No	Att (hrs)	Wk No	Att (hrs)	Wk No	Att (hrs)
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2400	Njeri	Accounts	215	1	12	2	32	3	40
3625	Omolo	Sales	560	1	23	2	35	3	35

(i) Justify why the data in the table is not in a normalised form. (2 marks)

(ii) Convert the table above into its 1st Normal Form (1NF). (3 marks)

Save question 22 document and upload. **(Total: 20 marks)**

23. Create a word processing document named "Question 23" . Use the word processor document to save your answers to questions (a) to (c) below:

A hospital intends to cut costs by purchasing non-generic medicines direct from manufacturers rather than from a wholesaler. The pharmaceutical company that invented a drug has exclusive rights for the first ten years. After that other companies may produce a generic equivalent.

The medicine relation already exists in the database and if necessary, further attributes will be added to this relation. The relation manufacturer will be added to the database. The purchasing application will also use a view of the database.

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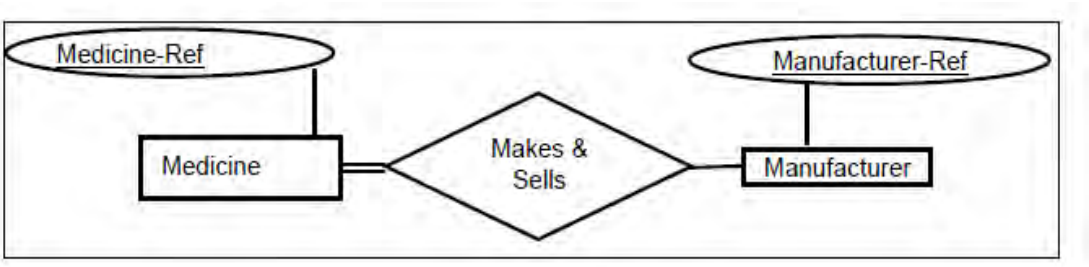

For each of the above entities:

(i) Suggest a suitable set of attributes and their attribute types. (6 marks)

(ii) Specify any foreign keys. (2 marks)

(b) Using the attributes suggested in (a) above:

(i) Create medicine and Manufacturer tables. (4 marks)

(ii) Write an SQL statement to append one record in each of the tables created in (b) (i) above. (4 marks)

(c) Create a data dictionary for the two tables and capture the first two pages of this data dictionary. (4 marks)

Save question 23 document and upload **(Total: 20 marks)**

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DIPLOMA IN DATA MANAGEMENT AND ANALYTICS (DDMA)

LEVEL II

DATABASES

MONDAY: 24 April 2023. Morning Paper. **Time Allowed: 3 hours.**

Answer All questions. This paper has two sections. SECTION I has twenty (20) Short Response Questions of two (2) marks each. SECTION II has three (3) practical questions of sixty (60) marks. Marks allocated to each question are shown at the end of the question.

Required Resources:

- **SQL**
- **DBMS**

SECTION I (40 MARKS)

1. The process of organising a database to reduce redundancy and improve data integrity is referred to as: (2 marks)

2. In relational databases, what is the relationship which occurs when a parent record in one table can potentially reference several child records in another table? (2 marks)

3. What is name of the term that defines how data is organised within a relational database? (2 marks)

4. A database model wherein multiple member records or files can be linked to multiple owner files and vice versa is known as? (2 marks)

5. Write an SQL command which will return records of students whose name is Johannes and less than 27 years old. (2 marks)

6. What is the name of the diagram that lets you see how different entities relate to each other in an application or a database? (2 marks)

7. In database management systems, which is the attribute that is made up of multiple sub-attributes or components attributes? (2 marks)

8. What is the name of the constraint which states that the primary value key cannot be null because the primary value key is used to find out individual rows in relation and if the value of the primary key is null then it is not easy to identify those rows? (2 marks)

9. What is the name of a constraint that determines the relation of one attribute to another attribute in a Database Management System (DBMS) and helps to maintain the quality of data in the database? (2 marks)

10. The person responsible for the design, implementation, maintenance and repair of an organisation's database is known as? (2 marks)

11. _____is the process of collecting, aggregating, and analysing metrics to improve awareness of the components' characteristics and behavior. (2 marks)

12. The subset of a database which is based on a query that runs on one or more database tables is known as? (2 marks)

13. Write an SQL statement which can be used to delete a view known as custview from a customer table. (2 marks)

14. Which is the type of query that calculates the sum, average, or other aggregate function, and then groups the results by two sets of values; one set on the side of the datasheet and the other set across the top? (2 marks)

15. The following are conditions of a relation during normalisation:
- There should be no repeating groups or elements in the relation
- There should be a unique name to be specified for each attribute within the table.
- It should not contain any composite attributes.

State the normal described by the above scenario. (2 marks)

16. The ability to modify the schema definition in one level in such a way that it does not affect the schema definition in the next higher level is referred to as? (2 marks)

17. The keyword that returns all records from the right table (table2), and the matching records from the left table (table1) is known as: (2 marks)

18. Which is the SQL statement that is used to modify existing records in a table? (2 marks)

19. The name of the database performance metrics which gives the volume of work done by the database server over a unit of time such as per second, or per hour is known as: (2 marks)

20. The name of the collection of data stored on a database at a particular moment is known as: (2 marks)

SECTION II (60 MARKS)

21. Create a word processing document named "Michezo Club" and use the word processor document to save your answers to questions (a) to (d).

(a) Michezo Member Club has a database for its record keeping. The tables mainatined are as shown below.
Member (MemNo, Name, HseNo, Postcode, Phone)
Supervisor (SupNo, Name, HseNo, Postcode, Phone)
Activity (Activity, Date, Location)
Member Activity List (MemNo, Activity)
Supervisor Activity List (SupNo, Activity)

Required:
Using an appropriate DBMS create a database named Michezo Club containing the five tables above. Capture a screen shot showing the five tables. (5 marks)

(b) (i) Explain why it is impossible to infer the cardinality of the relation Supervisor from the information given. (2 marks)

(ii) How many of the tables shown have compound primary keys? (1 mark)

(c) Explain why the tables Member Activity List and Supervisor Activity List were introduced rather than adding Activity as a field in both the Member and the Supervisor tables. (4 marks)

(d) Write a set of Structured Query Language (SQL) instructions that will produce a list showing the Name and Phone of all members who take part in the activity Cricket. Capture/type these instructions. (8 marks)

Upload Michezo Club document.

(Total: 20 marks)

22. Create a word processing document named "Savian Supermarket" and use the word processor document to save your answers to questions (a) and (b).

One purchasing section of a Savian Supermarket deals with fruit, vegetables and flower purchases. The department employs a number of agents in different locations. Each of these agents has contracts with a number of farmers who will supply the produce as required. The supermarket database contains the following relations:

Purchasing Dept(Produce_type, Address, Email, Phone)
Agent(AgentRefNo, AName, Address, Email, Phone, Produce_type)
Farmer(FarmerRefNo. FName, Address, Email, Phone, Main_produce, Secondary_produce, AgentRefNo)

Required:

(a) (i) Using an appropriate DBMS create a database named Savian Supermarket and then create the above three tables. Capture a screen shot showing the three tables. (3 marks)

(ii) Draw an Entity-Relationship Diagram (ERD) to show the relationship between these three entities using Chen notation. Capture a screen-shot of this ERD. (5 marks)

(iii) Identify the foreign keys in Agent and in Farmer entities and explain why these foreign keys are included. (4 marks)

(b) Information about tulip production is required. The required report should show the names and addresses of all farmers whose main produce is tulips, and the name and email of the agent who has contracted the farmer. The report should be sorted in farmer name order.

(i) Write a set of Structured Query Language (SQL) statements that will produce the query. Capture a screen shot. (4 marks)

(ii) Using the Farmer table, write a set of Structured Query Language (SQL) statements that will return the number of records that have the Main_produce set to tulips. (4 marks)

Upload Savian Supermarket document.

(Total: 20 marks)

23. Create a word processing document named "Kigerio Board" and use the word processor document to save your answers to questions (a) to (e).
Kigerio examining board uses a database to record exam entries as follows:
Members(MemberNo, Name, Address, City, Postcode, Email)
Entries(ExamNo, MemberNo, Subject Ref, CentreRef, Examdate)
Centres(CentreRef, Cname, Aaddress, Ccity, Region, ContactPerson,C Phone, CEmail)
Subjects(SubjectRef, Sname, Level)

(a) (i) Using an appropriate DBMS create a database named Kigerio Board and then create the four tables above.
Capture a screen-shot showing the four tables. (4 marks)

(ii) Create the Relationship Diagram and capture the screen-shot. (2 marks)

(b) (i) Write a query using a Query by Example (QBE) interface displaying the following;
Members: Number, name, address, city and postcode
Exam: Number
Subject: Subject name
Centres: Name and address
The records should be sorted using Exam number. Capture a screen-shot. (6 marks)

(ii) What are the principal advantage and the main disadvantage, of using QBE to formulate queries? (2 marks)

(c) Write Sequential Query Language (SQL) statements that will produce the same results as the query shown above. Capture a screen-shot. (6 marks)

Upload Kigerio Board document.

(Total: 20 marks)

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DIPLOMA IN DATA MANAGEMENT AND ANALYTICS (DDMA)

LEVEL II

DATABASES

MONDAY: 5 December 2022. Morning Paper. **Time Allowed: 3 hours.**

Answer All questions. This paper has two sections. SECTION I has twenty (20) Short Response Questions of two (2) marks each. SECTION II has three (3) practical questions of sixty (60) marks. Marks allocated to each question are shown at the end of the question.

Required Resources:

- **SQL**
- **DBMS**

SECTION I (40 MARKS)

1. The name of a single row of a table which contains a single record is _____. (2marks)

2. The relational integrity constraint which states that in a relation, no key attribute entry shall be null is referred to as _____. 2marks)

3. Theta join, natural join and equijoin are types of _____. (2marks)

4. Name the type of entity that **DOES NOT** have a primary key attribute and depends on another entity via a foreign key. (2marks)

5. The database type that is built, deployed and delivered through a virtual platform is referred to as _____. (2marks)

6. The language that supports the writing of commands to perform desired operations on the data stored in the database is referred to as _____. (2marks)

7. The data model that offers a big-picture view of what the system will contain, how it will be organised and defines the business rules involved is referred to as _____. (2marks)

8. Name the second stage in the data modelling process? (2marks)

9. The dimensional data model in which data is organised into facts and dimensions is referred to as _____. (2marks)

10. The rule that defines the quality which a DBMS requires in order to become a Relational Database Management System (RDBMS) is referred to as _____. (2marks)

11. State the form that describes a table or relation that is in second normal form and contains no transitive dependencies? (2marks)

12. Name the Structured Query Language (SQL) command that can be used to add up additional column, drop existing columns or change the data type of columns. (2marks)

13. Write the SQL command that can select all the fields in a table. (2marks)

14. The database practice that involves routinely checking important business data against quality control rules to ensure that it meets the defined standards is referred to as _____. (2marks)

15. The type of database performance tuning where a number of performance statistics are examined to identify whether there are changes in system behavior and resource usage is referred to as? (2marks)

16. The database performance monitoring tool that offers simplified deployment management through the use of pre-configured versions of VM for Azure is referred to as? (2marks)

17. The term which **BEST** describes how the database engine continuously monitors the workload on the database is referred to as? (2marks)

18. A book is written by one or more authors and an author writes one or more books. Which type of relationship in database modelling will be represented by this statement? (2marks)

19. The SQL statement that is used to add, delete or modify columns in an existing table is referred to as? (2marks)

20. The DBMS language that is used to manage transactions in the database is referred to as? (2marks)

SECTION II (60 MARKS)

21. Create a word processing document named "Employees" and use the word processor document to save your answers to questions (a) to (c).

Consider the following two tables and use them to answer the questions that follow:

Employee

EmployeeID	EmployeeAddress	EmployeeLName	EmployeeSalary
C134	P.O BOX 34, Nairobi	Omanyala	$ 860
D234	P.O BOX 432, Nakuru	Omurwa	$ 780
D546	P.O BOX 4586, Mombasa	Namulongo	$1060
C324	P.O BOX 8872, Kisumu	Onyango	$2010

Customer

CustomerID	EmployeeID	CustomerFName
13	C134	Julius
18	D546	Victor
16	C134	Alice
19	D234	Nixon

(a) Create a database named **Employer** using SQL. Write the SQL statements that will create the Customer and the Employee tables. Capture the screenshots showing the SQL statements. (8 marks)

(b) Using SQL, insert data into both tables. Capture the screenshots of the insert statements. (6 marks)

(c) Write the SQL statement that will list the customer identification, employee ID, customer first name and employee salary for all employees whose salary is $800 and above. Order the result by customer first name in ascending order. Capture and display the screenshots. (6 marks)

Upload employees document.

(Total: 20 marks)

22. Create a word processing document named "Sales" and use the word processor document to save your answers to questions (a) to (d).

Consider the following table for a Sales company:

Tool

Tool ID	Tool Name	Type	Price per Hour
1	Hand Electric Drill	Home DIY	£10.00
3	Pneumatic Drill	Industrial	£50.00
7	Road Roller	Industrial	£80.00
2	Wall Paper Stripper	Home DIY	£5.00
17	Sander	Home DIY	£5.00

(a) Using a DBMS of your choice, create the Tool relation in Sales database and insert the data in the table. Capture and save your output. (10 marks)

(b) Write SQL statement that will change the name of the tool called 'Hand Electric Drill' to 'Pliers'. (4 marks)

Capture and save your output.

(c) Insert a column named quantity that would contain numerical values. (3 marks)

Capture and save your output.

(d) Using an appropriate procedure, count all tools whose price is less than $20.00. (3 marks)

Capture and save your output.

Upload sales document.

(Total: 20 marks)

23. Create a word processing document named "Our environment" and use the word processor document to save your answers to questions (a) to (e).

Using a DBMS of your choice, answer the following questions:

(a) Create a database called environment. (2 marks)

Capture and save your output.

(b) In environment database create a table shown below: (4 marks)
Table: trees

FIELD NAME	DATA TYPE	CONSRAINTS
TREE_ID	VARVHAR2[4]	PRIMARY KEY
TREE_NAME	VARVHAR2[15]	NOT NULL
TREE_TYPE	VARVHAR2[12]	NOT NULL
MATURITY_AGE	INTEGER	
USES	VARVHAR2[15]	

Capture and save your output.

(c) Input the following data in Trees table (5 marks)

TREE_ID	TREE_NAME	TREE_TYPE	MATURY_AGE	USES
T505	MARSH	DECIDIOUS	50	TIMBER
T506	TANGLED	DECIDIOUS	55	ENERGY
T507	CYCAD	EVERGREEN	30	AESTHETIC
T508	VIRBURNUM	EVERGREEN	38	MEDICINE

Capture and save your output.

(d) Change the MATURITY_AGE of CYAD to 40 using SQL statement and capture the screenshot. (4 marks)

(e) Perform the following database activities.

(i) Create a database called “pictures”. (2 marks)

(ii) Create a username called Vero with password Vero@2022 (3 marks)

Capture screenshots to demostrate how you have performed th above task.

Upload “Our environment” document.

(Total: 20 marks)

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DIPLOMA IN DATA MANAGEMENT AND ANALYTICS (DDMA)

LEVEL II

DATABASES

MONDAY: 1 August 2022. Morning paper. **Time Allowed: 3 hours.**

This paper has two sections. SECTION I has twenty (20) Multiple Choice Questions. SECTION II has three practical questions of sixty (60) marks. All questions are compulsory. Marks allocated to each question are shown at the end of the question.

SECTION I

1. Which of the following correctly defines a database? (2 marks)
   A. Organised collection of information organised in a text file
   B. Collection of data without organising it
   C. Organised collection of data that cannot be updated
   D. Organised collection of data or information that can be accessed, updated, and managed

2. An in -built language in DBMS for all data operations is known as? (2 marks)
   A. Python
   B. Visual basics
   C. Jython
   D. SQL

3. Which type of data can be stored in the database? (2 marks)
   A. Image oriented data only
   B. Text, files containing data and many others
   C. Data in the form of audio or video only
   D. Text only

4. A database object that stores data extracted from a database is known as? (2 marks)
   A. Tables
   B. Views
   C. Materialised views
   D. Query

5. Which of the following is type of license in DBMS software? (2 marks)
   A. Number of users
   B. Number of rows
   C. Number of tables
   D. Number of fields

6. Which of the following is the odd one out? (2 marks)
   A. MySQL
   B. Dbase IV
   C. IBM DB2
   D. Excel

7. The command **"create"** in DBMS can be classified as? (2 marks)
   A. DML(Data Manipulation Language)
   B. Query
   C. DDL(Data Definition Language)
   D. Relational Schema

8. Which of the following is the correct term for database model in which the data in tables are connected with relationships? (2 marks)
   A. Relational
   B. Hierarchical
   C. Object oriented
   D. Flat file

9. The statement "SELECT course_id, name,FROM course, registered WHERE course_id= registered_ID" can be replaced with? (2 marks)
   A. Select * from instructor
   B. Select * from registered
   C. Select name, course_id from course natural join registered;
   D. Select name, course_id from course;

10. Which database object is used to cause another action to take place? (2 marks)
   A. Trigger
   B. Form
   C. Query
   D. Report

11. The command used to show the table structure is? (2 marks)
   A. Select
   B. DESC
   C. Alter
   D. Update

12. The files that keep track of database updates are known as? (2 marks)
   A. Reports
   B. Trails
   C. Data files
   D. Logs

13. The act of ensuring that a database performs optimally by configuration is known as? (2 marks)
   A. Adapting
   B. Tuning
   C. Backing up
   D. Triggering

14. Which of the following statements is correct based on databases?
   A. A database stores only the current data in use
   B. It is not necessary to backup data if it is replicated
   C. It is sometimes necessary to have redundancy in databases
   D. Redundancy is not completely necessary in DBMS

15. A hot backup cannot be used directly. Is this statement TRUE or FALSE? (2 marks)
   A) TRUE
   B) FALSE

16. Which of the following statements is correct?
   A. Sample databases in a DBMS are not useful
   B. Sample databases may be used by a user to create tables
   C. Sample databases should not be used directly by users
   D. We should delete sample databases

17. What is the name given to a large collection of the information or data accumulated form several different sources? (2 marks)
   A. Data Management
   B. Data Mining
   C. Data Warehouse
   D. Backup

18. The extraction of data and information from the data warehouse is known as? (2 marks)
A. Data mining
B. Data redundancy
C. Data recovery tool
D. Data selection

19. Data about data is also known as? (2 marks)
A. Directory
B. Sub Data
C. Warehouse
D. Meta Data

20. Which of following terms does **NOT** describe a row of table in a relational database? (2 marks)
A. Record
B. Tuple
C. Entity
D. Column

SECTION II

21. Create a word processor document named Question 21 and use it to save answers to questions (a) to (e) in form of screenshots:

Using a DBMS of your choice, answer the questions below:

(a) Create a database called exams. (3 marks)

(b) In exams create a table shown below.

Table: student

NAME	DATA TYPE	CONSTRAINTS
STUDENTID	VARCHAR2[10]	PRIMARY KEY
STUDENTNAME	VARCHAR2[8]	NOT NULL
STUDENTADDRESS	VARCHAR2[12]	NOT NULL
STUDENTAGE	INTEGER	

(6 marks)

(c) Input the following data:

STUDENTID	TERM	YEAR	CAT1
450	TERM 1	2020	56
451	TERM 1	2020	78

(4 marks)

(d) Add a field called teachercode. (4 marks)

(e) Input teachercode of your choice. (3 marks)

Upload Question 21 document.

(Total: 20 marks)

22. Create a word processor document and name it Question 22. Use Question 22 document to save answers to questions (a) to (e) below in form of screenshots.

Using a DBMS tools and perform the following:

(a) Create a database called secure (3 marks)

(b) Create a table plants with the following fields (plantid, plantname) (5 marks)

(c) Set encryption on for the table (5 marks)

(d) Create a user James for the database (3 marks)

(e) Set password as "Eun45@" (3 marks)

Upload Question 22 document.

(Total: 20 marks)

23. Create a word processor document named Question 23 and use it to save answers to questions (a) to (f) below in form of screenshots.

Perform the following database activities:

(a) Create a database called "publishing" . (3 marks)

(b) Create a table publisher with the following fields(pubid, pubname) (3 marks)

(c) Input three rows of data of your choice. (3 marks)

(d) Backup the database. (3 marks)

(e) Delete the database. (3 marks)

(f) Restore the database. (5 marks)

Upload Question 23 document.

(Total: 20 marks)

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