



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS**  
**UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN**  
**BUSINESS INFORMATION SYSTEMS**  
**3<sup>RD</sup> YEAR 1<sup>ST</sup> SEMESTER 2021/2022 ACADEMIC YEAR**  
**MAIN CAMPUS**

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**COURSE CODE: ITB 2311**

**COURSE TITLE: Data Management**

**DATE:**

**TIME:**

**TIME: 2 HOURS**

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**INSTRUCTIONS:**

- 1. Answer Question 1 (Compulsory) and ANY other two questions**
- 2. Candidates are advised not to write on the question paper**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room**

## QUESTION ONE

1. Data and information are essentially the same thing.

A. True      B. False

2. Data processing can be as simple as organizing data to reveal patterns.

A. True      B. False

3. Data is the result of processing raw facts to reveal its meaning.

A. True      B. False

4. When data are entered into a form and saved, they are placed in the underlying database as knowledge.

A. True      B. False

5. Data constitute the building blocks of information.

A. True      B. False

6. Metadata describe the data characteristics and the set of relationships that links the data found within the database.

A. True      B. False

7. The only way to access the data in a database is through the DBMS.

A. True      B. False

8. Database programming languages receive all application requests and translate them into the complex operations required to fulfill those requests.

A. True      B. False

9. The DBMS reveals much of the database's internal complexity to the application programs and users.

A. True      B. False

10. One disadvantage of the DBMS is that it increases the risk of data security breaches.

A. True      B. False

An operational database is sometimes referred to as an enterprise database.

A. True      B. False

12. A data warehouse can store data derived from many sources.

A. True      B. False

13. The same data might be simultaneously structured and unstructured depending on the intended processing.

A. True      B. False

14. Corporations use only structured data.

A. True      B. False

15. Field refers to a collection of related records.

A. True      B. False

16. Data anomaly is defined as the condition in which all of the data in the database are consistent with the real-world events and conditions.

A. True      B. False

17. Structural dependence exists when it is possible to make changes in the file structure without affecting the application program's ability to access the data.

A. True      B. False

18. An advantage of database systems is that you needn't perform frequent updates and apply latest patches.

A. True      B. False

19. One disadvantage of a database system over previous data management approaches is increased costs.

A. True      B. False

20. One advantage of a database system over previous data management approaches is that the database system is considerably less complex.

A. True      B. False

**21.** The presence of duplicate data in multiple data files is called program-data dependence.

A. True      B. False

**22.** The presence of duplicate data in multiple data files is called program-data dependence.

A. True      B. False

**23.** The DBMS acts as an interface between the application programs and the physical data files.

A. True      B. False

**24.** Structured Query Language is the standard data manipulation language for relational database management systems.

A. True      B. False

**25.** A record in a relational database is called a tuple.

A. True      B. False

**26.** In a relational database, the three basic operations used to develop useful sets of data are select, form, and join.

A. True      B. False

**27.** The JOIN operation combines relational tables.

A. True      B. False

**28.** The most popular type of DBMS today for PCs as well as for larger computers and mainframes is the hierarchical DBMS.

A. True      B. False

**29.** Object-oriented DBMS can handle multimedia.

A. True      B. False

**30.** Information for targeted marketing is often gathered through data mining.

A. True      B. False

## **QUESTION TWO**

- a) Define Distributed Database Systems DDBs, highlight any THREE benefits and briefly explain them. (8 Marks)
- b) Enumerate the basic steps of Data Governance? (8 Marks)
- c) Spatial Range query, Nearest Neighbour query, and Spatial Join query are the main query types over spatial data. Explain any TWO of them. (4 Marks)

## **QUESTION THREE**

- a) Parallel database systems consist of multiple processors and multiple disks connected by a fast interconnection network, this can result to performance issues.
  - i) Explain TWO performance measures used in parallel database systems. (4 Marks)
  - ii) using relevant examples discuss the concept of scale-up and speed-up in relations to parallel database systems. (6 Marks)
- b) Explain distributed database catalogue and discuss the following approaches used in implementation of distributed database catalogue. Centralized, Fully replicated, Partitioned and Centralized/partitioned above. (10 Marks)

## **QUESTION FOUR**

- a) Using examples differentiate between Heuristic query optimization and Cost-based query optimization (10 Marks)

b) Define 2 phased locking and Elucidate on how Lock and unlock requests are handled by the lock manager (10 Marks)

### **QUESTION FIVE**

a) Assume your Cadet Brigade Commander discusses the possibility of transforming the dosier from a file-based application to a database management system. Knowing you have taken the Data Management course, he expresses his concerns to you regarding the transition to database management systems. Discuss with four (4) valid points how you will convince him that it is okay to switch to a database management system. (8 Marks)

b) Evaluate any THREE ancient data management techniques (6 Marks)

c) Enumerate on the 3 V's of Big data (6 Marks)