

BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SCIENCE EDUCATION

EDUCATIONAL TECHNOLOGY DEPARTMENT

CS413/EDT413 ADVANCED DATABASE SYSTEMS

C

DURATION 3 HOURS

TOTAL MARKS IS 100

INSTRUCTIONS TO CANDIDATES

JAN 2025

Answer all QUESTIONS

QUESTION 1

- a) Define the following constraints providing examples where appropriate:
- i. Integrity constraints
 - ii. Primary key constraints
 - iii. Foreign key constraints
 - iv. Check constraints [8]
- b) Define data warehousing and explain its purpose within an organization, discussing its role in business intelligence. [12]

QUESTION 2

- a) Describe the role of data mining in business intelligence; provide examples of common data mining techniques such as classification, clustering, and association rule mining. [10]
- b) Discuss the importance of security measures in database management systems for sensitive customer information; include examples of common security practices such as encryption or access controls. [10]

QUESTION 3

- a) Given a scenario where sensitive customer data must be protected from unauthorized access or breaches, outline a comprehensive security strategy that includes access control measures, encryption methods, monitoring tools, and employee training programs. Explain how each component contributes to overall database security; discuss any interdependencies between these components that may enhance security effectiveness.

[15]

- b) Identify potential risks associated with inadequate security measures and suggest mitigation strategies that organizations should consider implementing.

[5]

QUESTION 4

- a) Evaluate the impact of emerging technologies such as cloud databases on traditional database management practices; discuss both benefits and challenges presented by cloud computing for data storage solutions.

[8]

- b) Discuss how organizations can leverage geographic information systems databases to enhance decision-making processes; provide specific examples illustrating their application across various sectors such as urban planning or logistics management.

[8]

- c) Analyse future trends related to database technologies that may influence industry standards over time; consider aspects like scalability requirements or integration capabilities with other software systems.

[4]

QUESTION 5

- a) Create a proposal for enhancing database recovery strategies within an organization that handles large volumes of transactions; include considerations for backup frequency, recovery point objectives, recovery time objectives along with any relevant metrics used during evaluations.

[10]

- b) Discuss how these enhancements would improve overall business continuity planning efforts while minimizing downtime during unexpected incidents like hardware failures or cyberattacks.

[10]

*****END OF EXAMINATION*****