

KASNEB

CICT PART II SECTION 3

DATABASE SYSTEMS

PILOT PAPER

September 2015.

Time Allowed: 3 hours.

Answer ALL questions. Marks allocated to each question are shown at the end of question. Show ALL your workings.

QUESTION ONE

- (a) Define the following database terms:
- (i) Relation. (2 marks)
 - (ii) Data model. (2 marks)
 - (iii) Relationship set. (2 marks)
- (b) Outline four disadvantages of traditional file systems. (4 marks)
- (c) Citing an example in each case, explain three types of database anomalies. (6 marks)
- (d) Distinguish between “unordered files” and “sequential files” as used in databases. (4 marks)
- (Total: 20 marks)**

QUESTION TWO

- (a) (i) List three phases in database design methodology. (3 marks)
- (ii) Describe three techniques of allocating file blocks on a disk. (6 marks)
- (b) The following is a list of potential entities for a library database:
- Member.
 - Book.
 - Transaction.
- Required:**
- (i) Identify three key attributes of transaction entity. (3 marks)
- (ii) Draw an entity relationship diagram illustrating the entities in b (i) above. (5 marks)
- (c) Identify three types of privileges that can be granted to a database user. (3 marks)
- (Total: 20 marks)**

QUESTION THREE

- (a) The table below shows sample data for customers of Utawala Bank:

Customer - Number	Customer - Name	Customer - Address	Customer - Town
001	Grace Achilis	12304	Machakos
002	Ali Omar	4579	Bungoma
003	Pius White	12223	Narok
004	Victoria Hughs	17810	Machakos
005	Paul Stone	17945	Bungoma
006	Zack Sadika	23891	Narok

Required:

Write SQL statements to perform the following tasks:

- (i) Create the customer relation. (2 marks)
 - (ii) List all details of customers from Machakos and Bungoma. (2 marks)
 - (iii) Delete the customers from Narok. (2 marks)
 - (iv) Add the field "Customer-Savings" to the Customer table. (2 marks)
- (b) Describe the following terms as used in distributed database systems:
- (i) Fragmentation. (2 marks)
 - (ii) Replication. (2 marks)
- (c) Describe the four rules of database transactions. (8 marks)
- (Total: 20 marks)**

QUESTION FOUR

- (a) Highlight four goals of data mining. (4 marks)
 - (b) Identify three data management challenges in mobile computing environment. (6 marks)
 - (c) Explain how the following measures could be used to secure a database:
 - (i) Encryption. (2 marks)
 - (ii) Password protection. (2 marks)
 - (d)
 - (i) Suggest four challenges of integrating a database to other applications. (4 marks)
 - (ii) Outline two duties of a database administrator. (2 marks)
- (Total: 20 marks)**

QUESTION FIVE

- (a) Differentiate between logical data independence and physical data independence. (4 marks)
 - (b) Highlight three advantages and three disadvantages of web-based databases. (6 marks)
 - (c) Describe the following terms in the context of databases:
 - (i) Data definition language. (2 marks)
 - (ii) Performance tuning. (2 marks)
 - (iii) Open database connectivity (ODBC). (2 marks)
 - (d) Suggest four causes of database failures. (4 marks)
- (Total: 20 marks)**
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