

[4]

- ii. Illustrate independent data mart data warehousing environment. **5**
- iii. Differentiate between any two of the following: **5**
 - (a) Data scrubbing; data transformation
 - (b) Consolidation; federation
 - (c) OLAP tools and mining tools

Total No. of Questions: 6

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Enrollment No.....



Faculty of Engineering
End Sem Examination May-2023
CS3ED01 Database Application & Tools

Programme: B.Tech.

Branch/Specialisation: CSE /All

Duration: 3 Hrs.

Maximum Marks: 60

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

- Q.1
- i. Which of the following is not benefit of database approach? **1**
 - (a) Improved data quality
 - (b) Improved data sharing
 - (c) Reduce program maintenance
 - (d) Reduce installation and management cost
 - ii. A logical schema- **1**
 - (a) Describes the relationship between data
 - (b) Describes how data is actually stored on disk
 - (c) Is the entire database
 - (d) None of these
 - iii. An entity set that does not have sufficient attributes to form a primary key is termed a _____. **1**
 - (a) Strong entity set
 - (b) Variant set
 - (c) Weak entity set
 - (d) Variable set
 - iv. The attribute AGE is calculated from DATE_OF_BIRTH. The attribute AGE is- **1**
 - (a) Single valued
 - (b) Multi valued
 - (c) Composite
 - (d) Derived
 - v. Minimal super keys are called- **1**
 - (a) Candidate key
 - (b) Primary key
 - (c) Foreign key
 - (d) Both (a) & (b)
 - vi. A set of entities of same type that share same properties or attributes is called? **1**
 - (a) Entity Relationship
 - (b) Entity Model
 - (c) Entity Set
 - (d) Relationship

P.T.O.

[2]

- vii. Consider the following relational schemes for a library database. Book 1
(Title, Author, Catalog_ no, Publisher, Year, Price) Collection
(Title, Author, Catalog no)
With the following functional dependencies:
Title, Author \rightarrow Catalog_no
Catalog_no \rightarrow Title Author Publisher Year
Publisher, Title, Year \rightarrow Price
Assume { Author, Title } is the key for both schemes. Which of the following statements is true?
(a) Book is in 2NF and collection is in 3NF
(b) Both book and collection are in BCNF
(c) Both book and collection are in 3NF only
(d) Both book and collection are in 2NF only
- viii. Which of the following cannot be removed by 3NF? 1
(a) Partial dependency
(b) Transitive dependency
(c) Multi-valued attribute
(d) Multi-valued dependency
- ix. Which one of the following is not characteristic of Data Mart? 1
(a) Decentralized by user area
(b) Centralized, possibly enterprise-wide
(c) Highly denormalized
(d) Project oriented
- x. A distributed database is having following disadvantage- 1
(a) Reliability (b) Availability
(c) Modularity (d) Increased cost
- Q.2 i. List costs and risks of the database approach. 2
ii. Explain how CASE tools helps database management system development. 3
iii. Elaborate components of database environment. 5
- OR iv. Discuss three-schema architecture for database development. 5
- Q.3 i. Differentiate between degree and cardinality of relationship with suitable example and diagram. 2
ii. Illustrate following concepts of Enhanced ER model with suitable example and diagrams: 8
(a) Attribute inheritance (b) Partial specialization
(c) Disjoint constraints (d) Entity cluster

[3]

- OR iii. Suppose you are given the following requirements for a simple 8
database for the Indian Premier League (IPL):
(a) The IPL has many teams,
(b) Each team has a name, a city, a coach, a captain, and a set of players,
(c) Each player belongs to only one team,
(d) Each player has a name, a position (such as batsman or bowler or allrounder), and stats(No of match played, runs, highest score, average,wickets,catches,overs, total runs given,economy rate),
(e) A team captain is also a player,
(f) A match is played between two teams (referred to as host_team and guest_team) and has a date (such as May 11th, 2016),match_id,team_1,team_2 and a result.
Construct a clean and concise ER diagram for the IPL database.
- Q.4 i. Explain Referential integrity constraint. Briefly discuss delete rules for presence in referential integrity constraint. 3
ii. What do you understand by well structure relations? Which anomalies are eliminated in well structured relations? 7
- OR iii. Illustrate all seven steps for mapping EER model into relations. 7
- Q.5 i. What are the advantages and disadvantages of horizontal and vertical partitioning? 4
ii. Describe Third Normal Form (3NF). 6
Convert following relation in 3NF :
Relational schema Customer_Order(Order_ID, Order_Date, Customer_ID, Customer_Name, Customer_Address)
Set of functional dependencies
F:{Order_ID \rightarrow Order_Date, Customer_ID \rightarrow Customer_Name, Customer_ID \rightarrow Customer_Address }
- OR iii. What do you understand by determinants in context of functional dependencies? Define candidate keys and essential properties satisfied by candidate keys. 6
- Q.6 Attempt any two: 5
i. Define each of the following terms: (any five)
(a) Data mart (b) Reconciled data
(c) Star schema (d) Snowflake schema
(e) Transient data (f) Conformed dimension

P.T.O.

Marking Scheme

CS3ED01[T]- Database Applications and Tools

Q.1	i)	Which of the following is not benefit of database approach: d) reduce installation and management cost	1
	ii)	A logical schema a) describes the relationship between data	1
	iii)	An entity set that does not have sufficient attributes to form a primary key is termed a _____ c) Weak entity set	1
	iv)	The attribute AGE is calculated from DATE_OF_BIRTH. The attribute AGE is d) Derived	1
	v)	Minimal super keys are called: d) both Primary key and Candidate key	1
	vi)	A set of entities of same type that share same properties or attributes is called? c) Entity set	1
	vii)	Consider the following relational schemes for a library database. Book (Title, Author, Catalog_ no, Publisher, Year, Price) Collection (Title, Author, Catalog no) With the following functional dependencies: Title, Author → Catalog_no Catalog_no → Title Author Publisher Year Publisher, Title, Year → Price Assume { Author, Title } is the key for both schemes. Which of the following statements is true? a) Book is in 2NF and collection is in 3NF	1
	viii)	Which of the following cannot be removed by 3NF? d) Multi-valued dependency	1
	ix)	Which one of the following is not characteristic of Data Mart: b) Centralized, possibly enterprise-wide	1
	x)	A distributed database is having following disadvantage: d) increased cost	1

Q.2	i.	List costs and risks of the database approach	2
	ii.	At least 3 CASE tools in database management system development (1 mark for each tool)	3
	iii.	Description of components of database environment Block diagram	4 marks 1 mark
OR	iv.	Discuss Three-Schema Architecture for Database Development	5
Q.3	i.	Differentiate between degree and cardinality suitable example and diagram	1 mark 1 mark
	ii.	Illustration of each concepts Suitable example and diagram	1 mark 1 mark
OR	iii.	Construct a clean and concise ER diagram for the IPL database. i) Identification of entity sets and attributes ii) Identification of relationships and their cardinality iii) Identification of other concepts (roles, weak entity set, etc.)	3 marks 3 marks 2marks
Q.4	i.	Explanation of Referential integrity constraint Delete rules in referential integrity constraint	1 mark 2 marks
	ii.	Well structure relations Anomalies are eliminated in well-structured relations	7 3 marks
OR	iii.	7 steps for mapping EER model into relations each step	1mark for each step
Q.5	i.	Advantages and disadvantages of horizontal partitioning Advantages and disadvantages of vertical partitioning	2 marks 2 marks
	ii.	Description of Third Normal Form (3NF) Conversion of given relation in 3NF	3 marks 3 marks
OR	iii.	Determinants Candidate keys Essential properties satisfied by candidate keys	2 marks 2 marks 2 marks
Q.6		Attempt any two:	

[2]

[3]

- i. Definition of terms: (1 mark for each) **5**
- ii. Explanation of Independent Data Mart Data Warehousing Environment
Suitable Block Diagram 3 marks 2 marks **5**
- iii. Differentiate between following (2.5 marks for each) **5**
