Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem (Even) Examination May-2022

CB3CO07 Database Management System

Programme: B.Tech. Branch/Specialisation: CSBS

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.

Q.1 i. Which of the following represents a collection of concepts that are used to describe the structure of a database? **1**

(a) Data structure (b) Data model

(c) Data warehouse (d) Data mining

ii. Physical Data Independence is ability to modify _____ without affecting the logical schema. **1**

(a) Physical schema (b) Conceptual schema

(c) External schema (d) None of these

iii. Relational Calculus is: **1**

(a) Procedural (b) Non – procedural

(c) Both (a) and (b) (d) None of these

iv. Which relational algebra operation is used to partition a relation horizontally? **1**

(a) Project (b) Rename (c) Select (d) All of these

v. If every non-prime attribute is fully functionally dependent on key attribute of the relation, then relation is in: **1**

(a) 1NF (b) 2NF (c) 3NF (d) 4NF

vi. In functional dependency X-> Y, L.H.S is known as: **1**

(a) Dependent (b) Determinant

(c) Descriptive (d) None of these

vii. What are ACID properties of Transactions? **1**

(a) Atomicity, Consistency, Isolation, Database

(b) Atomicity, Consistency, Isolation, Durability

(c) Atomicity, Consistency, Inconsistent, Durability

(d) Automatically, Concurrency, Isolation, Durability

P.T.O.

viii. A system is in a _____ state if there exists a set of transactions such that every transaction in the set is waiting for another transaction in the set. **1**
(a) Idle (b) Waiting (c) Deadlock (d) Ready

ix. Which statement is used to revoke an authorization? **1**
(a) Revoke (b) Modify (c) Alter (d) Define

x. Prevention of access to the database by unauthorized users is referred to as: **1**
(a) Integrity (b) Productivity
(c) Security (d) Reliability

Q.2 i. Define following terms. **3**
(a) Schema (b) Database Management System
(c) Instance

ii. What is Three level Schema architecture? Explain its levels in detail. **7**

OR iii. Differentiate between file processing and database approach. **7**

Q.3 i. Define following terms with an example: **3**
(a) Primary key (b) Foreign key

ii. What are the different operations in relational algebra? Explain them. **7**

OR iii. Consider following relational schema and write SQL expressions for given queries. **7**
Sailors(sid: integer, sname: string, rating: integer, age: real)
Boats(bid: integer, bname: string, color: string)
Reserves(sid: integer, bid: integer, day: date)
(a) Find all information of sailors who have reserved boat number 101.
(b) Write SQL query for making sid and bid as foreign key in Reserves table.
(c) Find all bname of boats that starts with ‘a’ and ends with ‘a’.
(d) Find the names of sailors who have reserved a red boat.
(e) Find colour of boat reverse by sailor ‘Ram’.

Q.4 i. Explain 1NF with an example. **3**

ii. What is normalization? Explain 3NF and BCNF with an example and What is the main difference between these two normal forms? **7**

OR iii. Compute the closure of the following set F of functional dependencies for relation schema R = (A, B, C, D, E) **7**
A → BC, CD→ E, B → D, E →A
List the candidate keys for R.

Q.5 i. Explain hashing. **3**

ii. What is transaction? Discuss States of transaction and properties of transaction. **7**

OR iii. What is serial and concurrent schedule? Explain conflict serializability and view serializability. **7**

Q.6 Attempt any two:

i. Differentiate between DAC and MAC. **5**

ii. Write short note on distributed database. **5**

iii. Write short note on data mining. **5**

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Marking Scheme
CB3CO07 Database Management System

Q.1	i.	Which of the following represents a collection of concepts that are used to describe the structure of a database? (b) Data model		**1**
	ii.	Physical Data Independence is ability to modify _____ without affecting the logical schema. (a) Physical schema		**1**
	iii.	Relational Calculus is: (b) Non – procedural		**1**
	iv.	Which relational algebra operation is used to partition a relation horizontally? (c) Select		**1**
	v.	If every non-prime attribute is fully functionally dependent on key attribute of the relation, then relation is in: (b) 2NF		**1**
	vi.	In functional dependency X-> Y, L.H.S is known as: (b) Determinant		**1**
	vii.	What are ACID properties of Transactions? (b) Atomicity, Consistency, Isolation, Durability		**1**
	viii.	A system is in a _____ state if there exists a set of transactions such that every transaction in the set is waiting for another transaction in the set. (c) Deadlock		**1**
	ix.	Which statement is used to revoke an authorization? (a) Revoke		**1**
	x.	Prevention of access to the database by unauthorized users is referred to as: (c) Security		**1**
Q.2	i.	Schema	1 mark	**3**
		Database Management System	1 mark	
		Instance	1 mark	
	ii.	Three level Schema architecture	3 marks	**7**
		Explain its levels in detail	4 marks	
OR	iii.	Any seven differences	(1 mark * 7)	**7**
Q.3	i.	Primary key definition	1 mark	**3**
		Example	0.5 mark	
		Foreign key definition	1 mark	
		Example	0.5 mark	
	ii.	Different operations in relational algebra	3 marks	**7**
		Explain Any four operation (1 mark * 4)	4 marks	
OR	iii.	Consider following relational schema		**7**
		(a) Find all information of sailors	2 marks	
		(b) Write SQL query for making	2 marks	
		(c) Find all bname of boats	1 mark	
		(d) Find the names of sailors	1 mark	
		(e) Find colour of boat reverse	1 mark	
Q.4	i.	Definition of 1NF	2 marks	**3**
		Example	1 mark	
	ii.	Normalization	1 mark	**7**
		3NF	2 marks	
		BCNF	2 marks	
		Difference between these two normal forms	2 marks	
OR	iii.	As per computation / solution	7 marks	**7**
Q.5	i.	Hashing	3 marks	**3**
	ii.	Transaction	1 mark	**7**
		States of transaction	2 marks	
		Properties of transaction	4 marks	
OR	iii.	Serial and concurrent schedule	3 marks	**7**
		Conflict serializability	2 marks	
		View serializability	2 marks	
Q.6		Attempt any two:		
	i.	Differentiate between DAC and MAC.		**5**
		As per explanation	5 marks	
	ii.	Write short note on distributed database.		**5**
		As per explanation	5 marks	
	iii.	Write short note on data mining.		**5**
		As per explanation	5 marks	

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