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

Enrollment No.....

Faculty of Engineering

End Sem (Odd) Examination Dec-2022

CB3CO07 Database Management Systems

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 SQL command is used for removing (or deleting) a relation form the database? **1**

(a) Delete (b) Rollback (c) Drop (d) Remove

ii. A logical schema **1**

(a) Is the entire database

(b) Is a standard way of organizing information into accessible parts.

(c) Describe how data is actually stored in disk

(d) Both (a) and (c)

iii. SET concept is used in- **1**

(a) Relational model (b) Network model

(c) Hierarchical model (d) None of these

iv. Symbol used in E-R model to represent weak entity set is- **1**

(a) Dotted rectangle (b) Diamond

(c) Double outline rectangle (d) None of these

v. A function that has no partial functional dependencies is in which normal form? **1**

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

vi. The representation of the query in the form of data structure is classified as- **1**

(a) Query graph (b) Query tree

(c) Scanner tree (d) Parser tree

vii. During transaction before commit which of the following statement is done automatically in case of shutdown? **1**

(a) Rollback (b) Commit (c) View (d) Flashback

P.T.O.

viii. Locks placed by command are called _____. **1**
(a) Implicit locks (b) Explicit locks
(c) Exclusive locks (d) Shared locks

ix. _____ is responsible for using that the database remains in a consistent state despite system failure. **1**
(a) Storage manager (b) Sophisticated user
(c) End user (d) Transaction manager

x. MySQL uses security based on ACL which stands for _____. **1**
(a) Access Control Language
(b) Automatic Control Lists
(c) Access Control Lists
(d) Automatic Control Language

Q.2 i. What are the various responsibilities of a DBA? **3**

ii. Explain database structure with a diagram. Write down the main functions of each component. **7**

OR iii. Explain the three-level architecture of DBMS with the help of an example. Mention its advantages also. **7**

Q.3 i. How does tuple relational calculus differ from domain relational calculus? **2**

ii. Relational algebra and relational calculus are said to be equivalent in expressive power. Explain what this means, and how it is related to the notion of relational completeness. **8**

OR iii. Create an ER Diagram that can be implemented for a Medi Caps Hospital, using the following business rules: **8**
(a) A patient can make many appointments with one or more doctors in the clinic, and a doctor can accept appointments with many patients. However, each appointment is made with only one doctor and one patient.
(b) Emergency cases do not require an appointment. However, for appointment management purposes, an emergency is entered in the appointment book as "unscheduled."
(c) If kept, an appointment yields a visit with the doctor specified in the appointment. The visit yields a diagnosis and, when appropriate, treatment.

(d) With each visit, the patient's records are updated to provide a medical history.
(e) Each patient visit creates a bill. Each patient visit is billed by one doctor, and each doctor can bill many patients.
(f) Each bill must be paid. However, a bill may be paid in many installments, and a payment may cover more than one bill.
(g) A patient may pay the bill directly, or the bill may be the basis for a claim submitted to an insurance company.
(h) If the bill is paid by an insurance company, the deductible is submitted to the patient for payment.

Q.4 i. How to check that given super key is candidate key or not? **2**

ii. How normalization is useful in good database design? **3**

iii. Define functional dependency. Explain Armstrong's axioms or rules, with examples. **5**

OR iv. We are given a schema X (A, B, C, D). The set F of functional dependencies is **5**
F= {AB→C, C→D, B→C, D→B}
Answer the following question.
(a) Convert the given relation in BCNF.
(b) List all candidate keys of X.

Q.5 i. What do you mean by ACID properties of a transaction? **4**

ii. What do you mean by serializability? Discuss the conflict and view serializability with a suitable example. **6**

OR iii. Check whether the given schedule S1 with R and W, as read and write operations on object A and B is conflict serializable or not- **6**
S1: R1(A), R2(A), R1(B), R2(B), R3(B), W1(A), W2(B);

Q.6 Write short note on any two:

i. SQL injection. **5**

ii. Data Warehousing and mining. **5**

iii. Distributed databases. **5**

******

Marking Scheme
CB3CO07 Database Management System

Q.1	i)	Which of the following SQL command is used for removing (or deleting) a relation form the database? (c) Drop	**1**
	ii)	A logical schema (a) is the entire database	**1**
	iii)	SET concept is used in (b) Network model	**1**
	iv)	Symbol used in E-R model to represent weak entity set is (c) Double outline rectangle	**1**
	v)	A function that has no partial functional dependencies is in which normal form. (b) 2NF	**1**
	vi)	The representation of the query in the form of data structure is classified as (b) query tree	**1**
	vii)	During transaction before commit which of the following statement is done automatically in case of shutdown? (a) Rollback	**1**
	viii)	Locks placed by command are called _____. (b) explicit locks	**1**
	ix)	_____ is responsible for using that the database remains in a consistent state despite system failure. (d) transaction manager	**1**
	x)	MySQL uses security based on ACL which stands for _____ (c) Access Control Lists	**1**
Q.2	i.	At least three responsibilities each of 1 mark	**3**
	ii.	Description of Data base structure 2 marks Various functional components of a DBMS 3 marks Diagram 2 marks	**7**
OR	iii.	Explanation 4 marks Example 1 mark Its advantages 2 marks	**7**
Q.3	i.	At least two difference for each difference 1 mark	**2**
	ii.	Explanation 3 marks Notion of relational completeness 5 marks	**8**
OR	iii.	Identifying Entities 2 marks Identifying attributes 2 marks Identifying relationship 1 marks Identifying primary key 1 marks Identity Cardinality Ratios 1 mark Diagram 1 mark	**8**
Q.4	i.	For checking super key from candidate key 2 marks	**2**
	ii.	Three reasons (1*3 marks)	**3**
	iii.	Functional Dependency. 2 marks Armstrong's axioms with examples. 3 marks	**5**
OR	iv.	a) Convert the given relation in BCNF. 3 marks b) List all candidate keys {AB} of X. 2 marks	**5**
Q.5	i.	ACID properties of transactions. 1 mark for each properties (1 mark * 4)	**4**
	ii.	Serializability 1 mark Conflict serializability with a suitable example. 2.5 marks View serializability with a suitable example. 2.5 marks	**6**
OR	iii.	Check whether the given schedule S1 with R and W, as read and write operations on object A and B is conflict serializable or not- S1: R1(A) , R2(A) , R1(B) , R2(B) , R3(B) , W1(A) , W2(B);	**6**
Q.6		Write short note on any two:	
	i.	SQL injection. Definition 1 mark Types SQLI 3 marks Example 1 mark	**5**
	ii.	Data Warehousing 2.5 marks Data mining 2.5 marks	**5**
	iii.	Distributed databases. Background 1 mark Characteristic of distributed database 2 marks Challenges of distributed database 2 marks	**5**

******