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

Enrollment No.....

Faculty of Science

End Sem Examination Dec 2024

CA3CO09 Database Management Systems

Programme: BCA/BCA-MCA (Integrated) Branch/Specialisation: Computer Application

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.

			Marks	BL	PO	CO	PSO
Q.1	i.	Which of the following is not a characteristic of a DBMS? (a) Data redundancy (b) Data independency (c) Data security (d) Data integrity	**1**	01	01	01	
	ii.	What is the primary function of a database management system (DBMS)? (a) Software installation (b) Networking (c) Scheduling (d) Data storage and retrieval	**1**	01	01	01	
	iii.	Identify the purpose of an entity-relationship (ER) diagram- (a) To document the syntax of sql (b) To model physical database storage (c) To illustrate database relationships (d) To monitor the database performance	**1**	02	03	02	
	iv.	The generalization process is similar to the ____ (a) Bottom-up approach (b) Top-down approach (c) Up-bottom (d) Top-up	**1**	02	03	02	
	v.	Suppose R and S have n and m distinct tupples respectively. Then maximum number of tupples in R ⋈ S are- (a) n × m (b) n + m (c) n %m (d) n =m	**1**	02	02	03	

P.T.O.

vi.	A field in a table can be taken as a foreign key if- (a) It has a unique value (b) It is a primary key in some other table (c) It is present in all other tables (d) More than one of the above	**1**	01	01	03
vii.	If A determines B, and BC determines D, then AC determines D according to the ___ rule. (a) Transitive rule (b) Pseudo rule (c) Decomposition rule (d) Pseudo transitive rule	**1**	01	01	04
viii.	Non-prime attributes cannot be transitively dependent, so the relation must have the ___ normal form. (a) 1NF (b) 2NF (c) 3NF (d) BCNF	**1**	01	02	04
ix.	Which of the following occur when transaction cannot proceed for an infinite period of time, while other transaction in the systems continue normally? (a) Deadlock (b) Starvation (c) Wound-wait (d) Wait-die	**1**	01	06	05
x.	Which of the following is not a property of a transaction? (a) Atomicity (b) Simplicity (c) Durability (d) Isolation	**1**	01	01	05

Q.2	i.	Define data independence and its type.	**2**	02	01	02
	ii.	Describe the database users and responsibility of DBA.	**4**	02	01	02
	iii.	Explain the difference between traditional file system and DBMS.	**4**	02	03	02
OR	iv.	Write the importance of database language. Define DDL, DML and DCL in detail.	**4**	02	03	02
Q.3	i.	Write the steps involved in converting the ER constructs to relational schema.	**3**	02	02	03
	ii.	What is an entity? Explain strong and weak entity?	**2**	01	01	03
	iii	Explain entity integrity and referential integrity constraint. Why is each considered important?	**5**	02	03	03
OR	iv	Explain generalization and specialization with suitable example.	**5**	02	03	03

Q.4	i.	Explain primary key and foreign key with suitable example.	**3**	02	02	04
	ii.	What is relational algebra? Explain the following relational algebra operation with example. (a) Natural Join (b) Union (c) Cross product (d) Left outer join (e) Intersection	**7**	03	01	04
OR	iii.	Consider the schema, write the suitable SQL statements for following- Hotel (hotelno, hotelname, city) Room (roomno, hotelno, price) (a) List full details of all hotels in London. (b) Find out the number of rooms in each hotel. (c) Find out the number of rooms in each hotel in London. (d) Find all the hotelno whose name second character is 'A'. (e) Find out the hotelname whose room price between 100 to 500. (f) Apply the foreign key constraint to an attribute of a Room table. (with respect to hotel table). (g) Display the name of all the hotels alphabetically.	**7**	03	03	04

Q.5	i.	Explain all the rules for identifying functional dependencies in a relational database.	**4**	02	01	05
	ii.	Find out all the candidate key of a relation R: {A, B, C, D} using functional dependencies A -> B, B ->C, C->A	**6**	03	01	05
OR	iii.	Explain 2NF, 3NF and BCNF with suitable example.	**6**	02	03	05
Q.6		Attempt any two-				
	i.	Describe ACID property with example?	**5**	02	01	05
	ii.	Write Short notes on the following: (a) Concurrency control (b) Transaction states	**5**	02	01	05
	iii.	Write Short notes on the following: (a) Serializability (b) Deadlock	**5**	02	03	05

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Marking Scheme

CA3CO09 (T) Database Management Systems (T)

Q.1	i)	(a) data redundancy	**1**
	ii)	(d) data storage and retrieval	**1**
	iii)	(c) To illustrate database relationships	**1**
	iv)	(a) bottom-up approach	**1**
	v)	(a) n × m	**1**
	vi)	(b) It is a primary key in some other table	**1**
	vii)	(d) Pseudo transitive rule	**1**
	viii)	(c) 3NF	**1**
	ix)	(b) Starvation	**1**
	x)	(b) Simplicity	**1**
Q.2	i	Define Data independence (1 mark)and its type(type 1 mark)?	**2**
	ii	Describe the Database users (2 marks) and responsibility of DBA (2 marks)?	**4**
	iii	Explain the difference between traditional file system and DBMS(1 mark for each correct difference)?	**4**
OR	iv	Write the importance of database language (1 mark for correct importance)? Define DDL,DML and DCL in detail(1 mark for each language)?	**4**
Q.3	i.	Write the steps involved in converting the ER constructs to relational schema (1 mark for each correct steps)?	**3**
	ii.	What is an entity (1 mark for correct definition)? Explain strong and weak entity(0.5 mark for strong entity and 0.5 mark for weak entity) ?	**2**
OR	iii.	Explain entity integrity and referential integrity constraint (1.5 mark for each constraint correct explanation). Why is each considered important(1 mark for each correct importance)?	**5**
	iv	Explain Generalization and specialization with suitable example?(1.5 mark for correct explanation of generalization +1 mark for it example, 1.5 mark for correct explanation of specialization +1 mark for it example)	**5**
Q.4	i.	Explain primary key and foreign key with suitable example?(1.5 mark for each key with example)	**3**
	ii.	What is relational algebra (2 mark for correct definition)? Explain the following relational algebra operation with example.(1 mark for each operation with example) (a) Natural Join (b) Union (c) Cross product (d) Left outer join (e) Intersection	**7**
OR	iii.	Consider the schema, write the suitable SQL statements for following:(1 mark for each correct statement) Hotel (hotelno, hotelname, city) Room (roomno, hotelno, price) (a) List full details of all hotels in London. (b) Find out the number of rooms in each hotel. (c) Find out the number of rooms in each hotel in London. (d) Find all the hotelno whose name second character is 'A'. (e) Find out the hotelname whose room price between 100 to 500. (f) Apply the foreign key constraint to an attribute of a Room table. (with respect to Hotel table). (g) Display the name of all the hotels alphabetically.	**7**
Q.5	i.	Explain all the rules for identifying functional dependencies in a relational database (1 mark for each correct rule) ?	**4**
	ii.	Find out all the candidate key of a relation R: {A, B, C, D} using functional dependencies A -> B B ->C C->A (Solution : Total 3 candidate key {AD,BD,CD}are possible,2 mark each for find out correct candidate key)	**6**
OR	iii.	Explain 2NF,3NF and BCNF with suitable example?(2 mark for each normal form correct explanation with example)	**6**
Q.6		Attempt any two:	
	i.	Describe ACID property with example (5 mark)?	**5**
	ii.	Write Short notes on the following: (a) Concurrency control (2.5 mark) (b) Transaction states (2.5 mark)	**5**

[2] [3]

iii. Write Short notes on the following: **5**
(a) Serializability (2.5 mark)
(b) Deadlock (2.5 mark)

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