4E1305

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B.Tech. IV Sem. (Main) Examination, - July 2023
Computer Science and Engineering (AI)
4CAI4-05 Database Management System
CS, IT, AID, CAI

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

*Attempt **all ten** questions from **Part A**, Attempt any **five** questions out of **Seven** questions from **Part B** and **three** questions out of **Five** questions from **Part C**.*

Schematic diagrams must be shown wherever necessary. Any data missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (As Mentioned in form No. 205).

PART - A

(Word limit 25)

All questions are **compulsory** **(10×2=20)**

1. Write any four differences between file system and DBMS.
2. Draw state diagram of transaction.
3. What is ODBC? How does it differ from JDBC?
4. Consider a relation R(A,B,C,D,E) with A,B,C,D,E as attributes and functional dependency set $F = \{AB \rightarrow C, C \rightarrow D, B \rightarrow E\}$. Find out the candidate key.
5. How does weak entity differ from strong entity in ER model?
6. Explain various levels of data abstractions in DBMS.
7. How does correlated nested queries differ from simple nested queries. Explain with example.
8. Explain Aggregation with example.
9. Differentiate Generalization and Specialization.
10. In which applications, Embedded and Dynamic SQL are required?

PART - B

(Word limit 100)

Attempt any **five** questions **(5×4=20)**

1. Explain following joins with help of example -
   i. Theta join. ii. Equi Join.
   iii. Natural join. iv. Outer join.
2. How does triggers are useful in DBMS? Write a trigger in SQL to confirm value inserted in age field of a table is not less than 18 before inserting value.
3. Explain the role and importance of relational algebra. Also explain six basic operators of relational algebra with example.
4. Explain all six inference rules for functional dependency with example.
5. Consider the following schedule of three transactions T1, T2, T3 where X and Y are data items.

T1	T2	T3
	R(X)	
		R(X)
W(Y)		
	W(X)	
		R(Y)
	W(Y)	

Using precedence graph, find out whether the schedule is conflict serializable or not?

6. Explain irrecoverable and recoverable schedules with example.
7. Explain following keys with example -
   a. Primary key b. Candidate key.
   c. Super key d. Foreign key.

PART - C

Attempt any **Three** questions **(3×10=30)**

1. How does various E-R model constructs relate to relation model construct. Draw the detailed E-R model for library management system and then convert this ER model to relational model by mapping various constructs.

2. Consider the relations defined below :

DOCTOR (regno, name, telno, city, specialization).

PATIENT (pname, street, city)

VISIT (pname, regno, data _of_visit, fee)

Where the regno and pname fields identify the doctor and the patient uniquely respectively. Express following queries in SQL -

a. Get the name and regno of doctors who live in Kota. **(1)**

b. Find the name and city of patient(s) who visited a doctor on date 12 - Aug - 2022. **(1)**

c. Find out all doctors whose name start with letter 'n'. **(1)**

d. Find doctors whose specialization in 'NEURO'. **(1)**

e. Find out total number of patients visited by each doctor. **(2)**

f. Print patient name and doctor name to whom he has visited for treatment. **(2)**

g. Find out name of doctors who have not visited any patient yet. **(2)**

3. Explain Shadow paging and log based recovery techniques with advantages and disadvantages of each.

4. What is normalization? Explain all types of normal forms with example?

5. Write short note on following concurrency control schemes :

a. Lock - based protocol.

b. Timestamp based protocol.
