

Con. 4845-07.

(REVISED COURSE)

CD-5655

(3 Hours)

[Total Marks : 100]

- N.B. :** (1) Question No. 1 is **compulsory**.
 (2) Attempt any **four** questions out of remaining **six** questions.
 (3) **Figures** to the **right** indicate **full** marks.
 (4) Assume any **suitable** data wherever **required** but justify the **same**.
1. (a) Explain transaction state diagram. 5
 (b) Write relational Algebra operator Cartesian product, Natural join and outer joins with example. 5
 (c) Explain Thomas' write Rule. 5
 (d) Explain indexing in DBMS. 5
 2. Design and implement a database that manages information about Hospital. Some information includes :-
 (a) Permanent doctors get fixed salary. Personal information like name, address, date of birth etc. required. Consulting doctors visits at fixed time everyday. Information like name, contact number, specialization, charges etc. are required. 5
 (b) Patients are admitted to the hospital. Personal information like name, address, relatives name and address, patient's blood group, reason of admission etc. are required. 5
 (c) Patients are admitted to room of different types, per day charges depend on room type. 5
 (d) Various labs in hospital, where several tests conducted on patient each test has fixed charges. 5
 - (i) Draw an extended E R diagram for the system. 8
 - (ii) Design an object-oriented schema. 7
 - (iii) Take two typical queries and write them in OQL. 5
 3. (a) What is difference between Persistent and Transient objects ? How is persistence handled in typical object oriented system ? 10
 (b) Consider the following relational database :- 10
 - Customer (Customer_id, customer_name, customer_city)
 - Depositer (Customer_id, Account_no)
 - Account (Branch_name, Account_no, Balance)
 - Borrower (loan_no, customer_id)
 - Loan (Loan_no, amount)

Write SQL for the following queries :-

 - (i) Find customer name who have highest balance at Dadar branch.
 - (ii) Find customer id who have both loan and account.
 - (iii) Find customer names who have the same branch as ARS and having balance greater than Rs. 15,000/-.
 - (iv) Find those branches where the average account balance is more than Rs. 1 Lakh.

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4. (a) Since every conflict serializable schedule is view serializable, why do we emphasize conflict serializability rather than view serializability. 10
- (b) Draw and explain database system architecture. 10
5. (a) We decompose the schema $R = (A, B, C, D, E)$ into $(A, B, C)(A, D, E)$. Show that this decomposition is a lossless-join decomposition if the following set F of functional dependencies holds : 10
- $A \rightarrow BC$
 $CD \rightarrow E$
 $B \rightarrow D$
 $E \rightarrow A$
- (b) If deadlock is avoided by deadlock avoidance schemes, is starvation still possible ? Explain your answer. 10
6. (a) Compare the shadow-paging recovery scheme with the log-based recovery schemes in terms of ease of implementation and overhead cost. 10
- (b) (i) Define concept of referential integrity with example. 10
- (ii) Explain authorization and views to provide security for a database.
7. Write short notes on (any four) :- 20
- (a) Assertion
- (b) Object structure and Object Identity
- (c) BCNF and 4 NF
- (d) Comparison of RDBMS, OODBMS, ORDBMS
- (e) Aggregate Functions.