Total No. of Questions : 12]

SEAT No. :

**P2943**

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# T.E. (Computer )
# DATABASE MANAGEMENT SYSTEMS
# (2008 Pattern) (Semester - I) (310241)

*Time : 3 Hours]* *[Max. Marks : 100*

***Instructions to the candidates:***

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right side indicate full marks.***
3) ***Assume suitable data, if necessary.***
4) ***Answers to the two sections should be written in separate answer books.***
5) ***Answer any three questions from each section.***

***Q1)*** a) Explain DBMS structure in detail. **[8]**

b) Explain different levels of abstraction. **[6]**

c) What is meant by mapping cardinality? **[2]**

OR

***Q2)*** a) Explain following advantages of DBMS over file system: **[8]**

i) Data redundancy and isolation

ii) Data integrity

iii) Data isolation

iv) Concurrency

b) Explain the different constraints on specialisation & generalization with suitable example. **[4]**

c) Explain the concept of weak entity set with example. **[4]**

***P.T.O.***

***Q3)*** a) Consider following relational database **[8]**

Employee (emp_name, street, city)

Works (emp_name, company_name, salary)

Company (company_name, city)

Manages (emp_name, manager_name)

For each of the given query, give an expression in relational algebra.

i) Find employee name, street and city of residence whose salary exist in between 30000 & 40000 and work in XYZ Ltd.

ii) Find names, cities of residence and salary of all managers.

b) Explain DDL and DML with different commands/statements used in SQL. **[8]**

OR

***Q4)*** a) Write a short note on dynamic and embedded SQL. **[8]**

b) What is cursor? Explain explicit and reference cursor with example. How cursor is implemented using embedded SQL? **[8]**

***Q5)*** a) Describe the concept of transitive dependency and explain how this concept is used to define 3 NF. **[6]**

b) Compute the closure of the following set F of functional dependencies for relational schema, R = (A, B, C, D, E) **[6]**

$A \rightarrow BC, CD \rightarrow E, B \rightarrow D, E \rightarrow A$

List the candidate keys for R.

c) Prove the soundness of pseudo transitive dependency. **[6]**

OR

***Q6)*** a) Define and explain 1NF, 2NF and 3NF with examples. **[8]**

b) Explain different anomalies that exist in databases. **[6]**

c) Is a schema in 3NF always in 2Nf? Elaborate. **[4]**

## SECTION - II

***Q7)*** a) Explain in detail use of B-Tree as an indexing technique compare B - Tree and B+ Tree. **[8]**

b) What is ordered indices? Explain the types of ordered indices with suitable example. **[8]**

OR

***Q8)*** a) What are the steps involved in query processing. Explain each in brief with diagram. **[8]**

b) What are the advantages and disadvantages of hash indices relative to B tree indices? How might the type of index influence the query processing? **[8]**

***Q9)*** a) Explain the concept of transaction. Describe ACID properties for transaction. **[8]**

b) Explain shadow paging recovery scheme and log based recovery scheme. **[10]**

OR

***Q10)***a) Explain recoverable and cascade less schedules. **[8]**

b) Explain two phase locking protocol. How does it ensures serializability? **[10]**

***Q11)***a) Specify advantages and disadvantages of distributed database system. **[8]**

b) Write short note on any two **[8]**

i) Data warehouse

ii) Pointer swizzing techniques

iii) Data mining

OR

***Q12)***a) What is the difference between persistent and transient objects? How is persistence objects are handled in the typical OODatabase system? **[8]**

b) Explain 2-tier and 3-tier architecture. **[4]**

c) Explain steps in data mining. **[4]**