Reg No.										

MANIPAL INSTITUTE OF TECHNOLOGY
(Constituent Institute of Manipal University)
MANIPAL-576104

SIXTH SEMESTER B.TECH.(CSE) MAKE UP EXAMINATION – JULY– 2014

OPEN ELECTIVE: DATABASE MANAGEMENT SYSTEMS (CSE 342)

11-07-2014

TIME : 3 HOURS MAX.MARKS : 50

Instruction to Candidates

- Answer **any five** full questions.

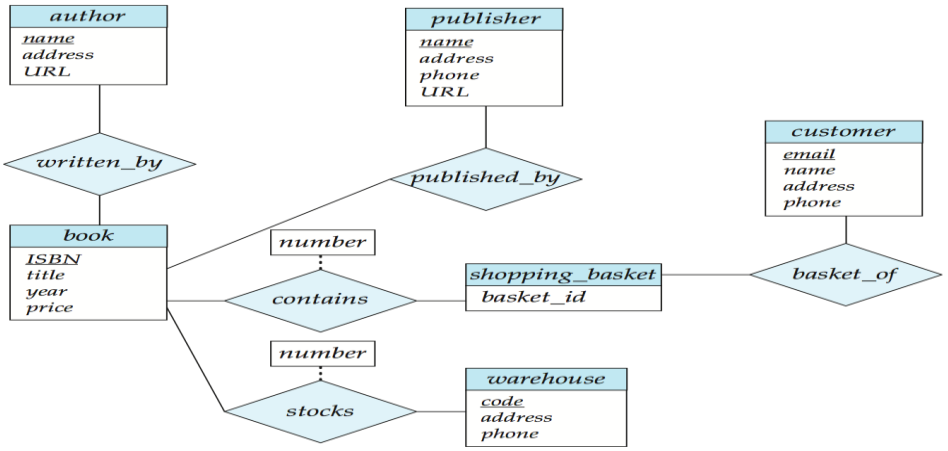
1A. Explain the following in the context of DBMS:
i. Logical Level ii. Instance iii. Physical data Independence iv. Procedural DML

1B. Explain the role of different database users

1C. What are the different types of attributes allowed in ER Diagram? How they represented in relational schema? (4+ 3 +3)

2A. What is Specialization? What are its design constraints? How the Specialization is represented via relational schemas?

2B. Map the following ER Diagram to relational schema. Assume appropriate cardinality constraints and participation.



2C. Illustrate the following Relational Algebra operations with necessary examples:
i. Select ii. Cartesian product iii. Natural join iv. Assignment. (3+ 3 +4)

3A. Consider the business trips database where the primary keys are underlined.

SalesPerson(Sid, name, start-year, dept-name)
Trip(from-city, to-city, trip-id)
Expense(trip-id, Sid, account-no, amount)
City(city, state)

Give an expression in the relational algebra to express each of the following queries:

i. List the names of the sales person who have visited the city(to-city) Mysore.
ii. List the names of cities(to_city) visited by two or more sales persons
iii. Find the sales person who has claimed maximum amount in total.

3B. Illustrate the following SQL constructs with necessary examples:

i. unique() ii. >all iii. Having iv. natural inner join

3C. What is a view? How it is created and accessed? (4+4+2)

4A. Consider the following College database schema:

Course(CId, CName, DNo)
Department(DNo, DName, HODFId)
Faculty(FId, FName, Designation, DNo)
Handles(FId, CId)

Write the following queries in SQL:

a) Find the name of all faculty who are not handling any course)
b) Find the name of the courses handled by multiple faculty
c) List the DName as per the order of faculty strength

4B. Explain the usage of with clause in deriving a temporary relation.

4C. Give Armstrong's inference rules for Functional Dependencies. How they are used in finding closure of set of functional dependencies? (4+2+4)

5A. Give an algorithm to compute closure of attribute sets. Apply the algorithm to find find $(AG)^+$ for the relation schema R = (A, B, C, G, H, I) with its functional dependencies: F = { $A \rightarrow B$; $A \rightarrow C$; $CG \rightarrow H$; $CG \rightarrow I$; $B \rightarrow H$}

5B. Consider the Relational Schema given below.

R(A,B,C D, E,F,G, H,I). Suppose the following FDs exist: { A} → {B,C}; { D} → { E,G}; {G → H,I}; {I} → {F}

i. Is {A,D}, candidate key of R? . Justify your answer.
ii. What normal form (X NF) is the relation in? Explain your answer.
iii. Apply normalization starting from (X+1) NF to BCNF until you cannot decompose the relations further. State the reasons behind each decomposition.

5C. Give a schedule which is view-serializable but *not* conflict serializable. Does it have any blind writes? (3+4+3)

6A. With a block diagram, explain the different states of a transaction

6B. Give a protocol which ensures conflict serializability as well as freedom from deadlock. What are its advantages and drawbacks?

6C. What are checkpoints? How it allows the system to streamline its recovery procedure? (3+ 4+3)

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