Code No: 134AP **R16**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, December - 2018
DATABASE MANAGEMENT SYSTEMS
(Common to CSE, IT)

Time: 3 Hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A

(25 Marks)

1.a) Define select and create statements. [2]
b) How would you map N-ary relationship into relations? [3]
c) What are Nested Queries? [2]
d) Explain with an example about aggregate operators. [3]
e) What are the properties of Decomposition? [2]
f) Give an example of a relation scheme R and a set of dependencies such that R is in BCNF but not in 4 NF? [3]
g) What happens if system crashes during analysis? How do you limit the amount of work in UNDO? [2]
h) What are the ACID Properties of a transaction? [3]
i) What is an index on a file of records? Why is it needed? [2]
j) What are the features of B^+ trees? [3]

PART-B

(50 Marks)

2.a) How are different schema layers related to the concepts of logical and physical data independence?
b) What are the functions of database manager?
c) What are statements used to update and alter the table contents? [3+4+3]

OR

3.a) Draw ER diagram for the following:
A teacher can teach many courses. A student can enroll in many courses. A course may be a part of one or many programmes. A teacher can be mentor for many students, however a student can have only one mentor.
b) Refer to the relation schemas given below and answer the questions asked after schema description.
Suppliers (S.No., Sname, City)
Parts(P.No., Pname, Colour, City)
Projects (ProjectNo., ProjectName, City)
Sup-Par-Proj(S.No., P.No., ProjectNo., Quantity)
What are the entity integrity constraints in the relations?
What are the referential integrity constraints in the relations? [5+5]

4.a) Consider the following schema:
Suppliers(sid: integer, sname: string, address: string)
Parts(pid: integer, pname: string, color: string)
Catalog(sid: integer, pid: integer, cost: real)
The Catalog relation lists the prices charged for parts by Suppliers. Write the following queries in Tuple relational calculus:

1. Find the pnames of parts for which there is some supplier.
2. Find the snames of suppliers who supply every part.
3. Find the pnames of parts supplied by Acme Widget Suppliers and by no one else.
4. Find the sids of suppliers who charge more for some part than the average cost of that part (averaged over all the suppliers who supply that part).
5. For each part, find the sname of the supplier who charges the most for that part.

b) With relevant examples discuss any 6 operations in Relational Algebra. [7+3]

OR

5.a) Consider the following relations:
Hotel (Hotel_no, Hotel_name, City)
Room (Room_no, Hotel_no, Type, Price)
Booking (Hotel_no, Guest_no, DateFrom, DateTo, Room_no)
Guest (Guest_no, GuestName, GuestAddress)
Write the appropriate queries in SQL for the following:
i) Find the average price of a room
ii) List the names and address of all guests with bookings for a hotel in London, alphabetically ordered by name
iii) Find the total income from all the rooms of the hotels in NewYork
iv) List the Name(s) of Guest(s) at the winner hotel, who are paying highest price for a room.

b) For the relations given below:

R1:

A	B
A1	B1
A7	B7
A2	B2
A4	B4

R2:

A	B
A1	B1
A2	B2
A3	B3
A4	B4

R3:

B
B1
B2

Find R_1 / R_3, $R_1 \cap R_2$, $R_1 \times R_2$ [4+6]

6. Explain in detail about 1NF, 2NF and 3NF with suitable examples. Find the highest normal form in R(A, B, C, D, E) under following functional dependencies.
ABC -> D
CD -> AE [10]

OR

7.a) Write the need for schema refinement in relational database design.
b) Define Join dependency. Explain 5NF with suitable example. [3+7]

8.a) Explain the Remote Backup system.

b) How transaction management supported in SQL? [5+5]

OR

9.a) How will you determine whether a schedule is serializable or not. Discuss any locking protocol how it resolves conflicts during concurrent execution of transactions?

b) Differentiate Transaction Recovery and Media Recovery? [7+3]

10.a) Discuss in detail about all file organization methods.

b) Construct a B^+ tree to insert the following key elements (order of the tree is 3)
5, 9, 12, 16, 21, 25, 32, 34, 38, 42, 51, 55, 61, 65 [6+4]

OR

11.a) Compare and contrast Hash based indexing and tree based indexing.

b) Suppose that we are using extendible hashing on a file containing records with the following search-key values: 5, 9, 12, 16, 21, 25, 32, 34, 38, 42, 51, 55, 61, 65
Show that the extendible hash structure for this file if the hash function is h(x) = x mod 3 and bucket can hold five records. [5+5]

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