JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, May - 2019
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 as sub questions.

PART – A

(25 Marks)

1.a) What is DBMS? What are the advantages of DBMS? [2]
  b) Explain generalization, specialization and aggregation in E-R Model. [3]
  c) Define the terms primary key constrains and foreign key and check constraints. [2]
  d) Explain the following Operators in SQL with examples: i) SOME ii) NOT IN. [3]
  e) What is normalization? What are the conditions required for a relation to be in 1NF, 2NF? [2]
  f) Explain what are the problems caused by redundancy. [3]
  g) What is locking Protocol? [2]
  h) Explain the ACID Properties of transaction with examples. [3]
  i) What is Indexing and Hashing? [2]
  j) Explain what are the differences between tree based and Hash based indexes. [3]

PART – B

(50 Marks)

2.a) Develop an E-R Diagram for Banking enterprise system.
  b) Explain the functions of Database Administrator. [5+5]
OR
3.a) Compare between super key, Candidate key, Primary Key for a relation with examples.
  b) Construct an ER-Diagram for a hospital with a set of patients and set of medical doctors. Associated with each patient a log of the various tests and examinations conducted. [5+5]

4.a) Explain the fundamental operations in relational algebra with examples.
  b) Explain various Domain constraints in SQL with examples. [5+5]
OR
5.a) Let R =(ABC) and S=(DEF) let r(R) and s(S) both relations on schema Rand S. Formulate an expression in the Tuple relational calculus that is equivalent to each of the following.
    i) $\prod_A(r)$ ii) $\sigma_{p=19}(r)$ iii) rXs   iv) $\prod_{A,F}(\sigma_{C=D}(rXs))$.
  b) Explain various DML functions in SQL with examples. [5+5]

6.a) When is a decomposition said to be dependency preserving? Why this property Useful? Explain.

b) Determine the closer of the following set of functional dependencies for a relation scheme. R(A,B,C,D,E,F,G,H),
F={ AB→C, BD→EF, AD→G,A→H}
List the candidate keys of R.   [5+5]

OR

7.a) Suppose that we decompose the schema $R = (A, B, C, D, E)$ into R_1 (A, B, C) and R_2 (A, D, E). Determine that this decomposition is a lossless-join decomposition or dependency preserving if the following set F of functional dependencies holds:
$A \rightarrow BC, CD \rightarrow E, B \rightarrow D, E \rightarrow A$

b) Explain 2NF, 3NF and BCNF Normal forms with example. What is the difference between 3NF and BCNF?   [5+5]

8.a) Explain the Time Stamp - Based Concurrency Control protocol. How is it used to ensure serializability?

b) Explain the Check point log based recovery scheme for recovering the data base. [5+5]

OR

9.a) Explain multiple granularity of locking protocol with example.

b) What is serializability? Explain.   [5+5]

10.a) Explain about Validation-Based Protocol.

b) Explain the Insertion and deletion Operations in B+ trees with example.   [5+5]

OR

11.a) Explain Deletion and insertion operations in ISAM with example.

b) Explain how does it handles insert and delete operations *Extendable hashing*?   [5+5]

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R16

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, April - 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) How to represent the strong Entity set and Weak entity set in ER-Model? [2]
  b) Explain about various integrity constraints in relational model. [3]
  c) What are the SQL statements are used to retrieve and modify the database? [2]
  d) Let R =(ABC) and S=(DEF) let r(R) and s(S) be relations on schema R and S. Give an expression in the Domain relational calculus that is equivalent to each of the following.
   i) $\sigma_{B=25}(r)$ ii) $\prod_{A,F}(\sigma_{C=D}(rXs))$ [3]
  e) What is schema refinement? [2]
  f) Define Multi valued dependencies and join dependency. [3]
  g) What is serilizabuilty? [2]
  h) Explain Failure with loss of nonvolatile storage. [3]
  i) What is primary and secondary indexing? [2]
  j) What is the difference between indexing and hashing? [3]

PART-B

(50 Marks)

2. Give an overview of database architecture. [10]

OR

3.a) Give an overview of database languages – DDL and DML.
  b) What are speciality databases? Explain. [5+5]

4.a) Explain the fundamental operations in relational algebra with examples.
  b) What aggregate operators does *SQL* support? Explain with examples. [5+5]

OR

5.a) What is trigger? Explain how to implement triggers in SQL?
  b) Explain the following Operators in SQL with examples:
  i) SOME   ii) IN   iii) EXCEPT   v) UNION. [5+5]

6.a) What do you mean by scheme refinement? Explain how it can be accomplished?

b) What are the problems caused by redundancy and decomposition of relation? [5+5]

OR

7.a) Compute the closure of the following set of functional dependencies for a relation scheme. R(A,B,C,D,E,F,G,H), F={ AB→C, BD→EF, AD→G,A→H}
List the candidate keys of R.

b) Explain 4NF, 5NF normal forms with examples. [5+5]

8.a) What is transaction? Explain the properties of transaction.

b) Give an overview of validation based protocol. [5+5]

OR

9.a) Explain about the Multiple granularity Concurrency Control protocol.

b) Explain about remote backup system. [5+5]

10.a) Give acomparison of various file organizations.

b) Describe the Insertion and Deletion Operations in B+ trees. [5+5]

OR

11. How does *Extendable hashing* use a directory of buckets? How does it handles the insert and delete operations? [10]

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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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Code No: 114CQ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, May - 2017
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) What is DBMS? What are the goals of DBMS? [2]
  b) Explain about DDL and DML languages. [3]
  c) Explain views in SQL language. [2]
  d) Explain domain relational calculus. [3]
  e) Define loss less join decomposition with example. [2]
  f) What is the difference between 3NF and BCNF? [3]
  g) What is locking Protocol? [2]
  h) When are two schedules conflict equivalent? What is conflict serializable schedule? [3]
  i) Why are tree-structure indexes are good for searches, especially range selections. [2]
  j) What is the main difference between ISAM and B+ tree indexes? [3]

PART-B

(50 Marks)

2.a) What are the main components in a DBMS and briefly explain what they do.
  b) Explain the following:
   i) View of Data   ii) Data Abstraction   iii) Instances and Schemas. [5+5]

OR

3.a) Develop ER-Diagram for a hospital with a set of patients and a set of medical doctors. Associated with each patient a log of the various tests and examinations conducted.
  b) What is relation? Differentiate between a relation schema and relation instance define the term arity and degree of a relation? What are domain constraints? [5+5]

4.a) Explain the fundamental operations in relational algebra with examples.
  b) Explain the following Operators in SQL with examples:
   i) SOME   ii) IN   iii) EXCEPT   iv) EXISTS [5+5]

OR

5.a) Let R=(ABC) and S=(DEF) let r(R) and s(S) both relations on schema R and S. Give an expression in the Tuple relational calculus that is equivalent to each of the following.
   i) $\sigma_{B=19}(r)$ ii) $\prod_{A,F,}(\sigma_{C=D}(r \times s))$ iii) $r \cap s$
  b) What are integrity constraints? Define the terms primary key constrains and foreign key constraints. How are these expressed in SQL? [5+5]

6.a) What is normalization? What are the conditions are required for a relation to be in 2NF, 3NF and BCNF explain with examples.

b) Compute the closer of the following set of functional dependencies for a relation scheme.
R(A,B,C,D,E)   F={A→BC, CD→E, B→D,E→A}
List out the candidate keys of R. [5+5]

OR

7.a) What are the conditions are required for a relation to be in 4NF and 3NF explain with examples.

b) Compute the closer of the following set of functional dependencies for a relation scheme.
R(A,B,C,D,E,F,G,H),   F={ AB→C, BD→EF, AD→G,A→H}
List the candidate keys of R. [5+5]

8.a) What is transaction? Explain the ACID Properties of transactions.

b) Explain the Check point log based recovery scheme for recovering the database. [5+5]

OR

9.a) Describe the steps in crash recovery in ARIES.

b) Explain the *Time Stamp - Based Concurrency* Control protocol. [5+5]

10.a) Explain Deletion and insertion operations in ISAM with examples.

b) How does *Extendable hashing* use a directory of buckets? How does it handles insert and delete operations. [5+5]

OR

11.a) Explain how insert and delete operations are handled in a static hash index.

b) Explain deletion and insertion operation in *B+ trees*. [5+5]

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R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, October/November - 2016
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) List the properties of ER diagram.   [2]
 b) Explain the three levels of abstraction.   [3]
 c) Explain integrity constraints over relations.   [2]
 d) Create a table with employee details like eno, ename, bdate, address, dno, age, phone number. List the name. eno, dname and phone number of the employee who are also the managers of the respective departments.   [3]
 e) What is functional dependency?   [2]
 f) How can we identify that the relation is in 2NF?   [3]
 g) Write about transaction states.   [2]
 h) What are ACID properties? Explain.   [3]
 i) What is an index? Give an example.   [2]
 j) What are the advantages of using tree structured indexes?   [3]

PART - B   (50 Marks)

2.a) What is a data model? What are the different data models? Explain E-R model and relation model briefly.
 b) Explain database users, user interfaces, DBA and functions of a DBA.   [5+5]

OR

3.a) What are the application programs? Explain database access for application programs.
 b) What is null attribute? With suitable diagram explain weak and strong entity set.
                                                                                [5+5]

4.a) Discuss in detail about the properties of relation algebra.
 b) How we can convert relationship sets with key constraints into tables? Explain.
                                                                                [5+5]

OR

5.a) Write short notes on difference, union, rename and Cartesian product operations in relational algebra.
 b) How we can translate E-R diagram with aggregation? Explain.   [5+5]

6.a) Explain different normal forms based on functional dependencies.
  b) Explain about dependency preserving decomposition. [5+5]

OR

7.a) Explain BCNF. Give an example.
  b) What are the steps to be followed to convert a relation in 3NF to BCNF? [5+5]

8.a) Explain ARIES in detail.
  b) How the lock manager implements lock and unlock requests? Explain. [5+5]

OR

9.a) How the concurrency control is done in B+ trees? Explain.
  b) What is schedule? Explain about serial and non serial schedule. [5+5]

10.a) What is a composite search key? What are the pros and cons of composite search keys?
  b) What are the performance implications of disk structure? Explain. [5+5]

OR

11.a) What are the different RAID levels? Explain.
  b) Compare linear hashing and extendable hashing. [5+5]

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Code No: 114CQ

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, May - 2016
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)	Discuss about DDL.	[2]
b)	Write brief notes on altering tables and views.	[3]
c)	Describe about outer join.	[2]
d)	What is meant by nested queries?	[3]
e)	What is second normal form?	[2]
f)	Describe the inclusion dependencies.	[3]
g)	What is meant by buffer management?	[2]
h)	What is meant by remote backup system?	[3]
i)	Discuss about primary indexes.	[2]
j)	What is meant by linear hashing?	[3]

PART - B   (50 Marks)

2.	Explain the relational database architecture.	[10]
	OR	
3.	State and explain various features of E-R Models.	[10]
4.	Explain Tuple relational calculus.	[10]
	OR	
5.	Discuss about domain relational calculus.	[10]
6.	What is meant by functional dependencies? Discuss about second normal form.	[10]
	OR	
7.	Explain fourth normal form and BCNF.	[10]
8.	What is meant by concurrency control?	[10]
	OR	
9.	Discuss about failure with loss of nonvolatile storage.	[10]
10.	What is meant by extendable hashing? How it is different from linear hashing?	[10]
	OR	
11.	What are the indexed data structures? Explain any one of them.	[10]

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Code No: 114CQ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, May-2015
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)	Differentiate between schema and data model.	[2M]
b)	Give an example for total participation and partial participation.	[3M]
c)	List the primitive operators in Relational Algebra.	[2M]
d)	What is an active database?	[3M]
e)	Define SECOND Normal form.	[2M]
f)	Write about join dependencies.	[3M]
g)	What methods are used to assign timestamps to transactions?	[2M]
h)	What is the significance remote backup system?	[3M]
i)	What is meant by secondary index?	[2M]
j)	How to compute the disk access time?	[3M]

PART - B   **(50 Marks)**

2.a) List various categories of database users and discuss their interfaces to DBMS.
  b) Discuss the functionality of query evaluation engine.   [5+5]

OR

3.   Construct an Entity-Relationship diagram for a online shopping systems such as
     Jabong/Flipcart. Quote your assumptions and list the requirements considered by
     you for conceptual database design for the above system.   [10]

4.a) With a suitable example explain division operation in relational algebra.
  b) What is the usage of 'group by' and 'having' clauses in SQL?   [5+5]

OR

5.   Consider the following schema to write queries in Domain relational calculus:
     Sailor(sid, sname, age, rating)
     Boats(bid, bname, bcolor)
     Reserves(sid,bid,day)
     a) Find the boats reserved by sailor with id 567.
     b) Find the names of the sailors who reserved 'red' boats.
     c) Find the boats which have at least two reservations by different sailors.   [10]

6.   What is meant by closure of F? Where F is the set of functional dependencies.
     Explain computing F+ with suitable examples.   [10]

OR

7.a) Differentiate between TD and MVD

  b) Explain the problems related to decomposition.   [5+5]

8.a) Explain transaction states and desirable properties.
 b) How to test serializability of a schedule? Explain with an example.   [5+5]

OR

9.a) Explain Failure classification.
 b) What is log? What is log tail? Explain the concept of checkpoint log record. [5+5]

10. Explain extendable hashing techniques for indexing data records. Consider your class students data records and roll number as index attribute and show the hash directory.   [10]

OR

11.a) Is disk cylinder a logical concept? Justify your answer.
 b) Compare heap file organization with hash file organization.   [5+5]

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