



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

ELECTRICAL AND ELECTRONIC ENGINEERING

DEFINITIONS AND TERMINOLOGY QUESTION BANK

Course Title	FUNDAMENTALS OF DATABASE MANAGEMENT SYSTEMS	
Course Code	ACS553	
Programme	B.Tech	
Semester	VII	EEE MECH
Course Type	Core	
Regulation	IARE - R16	
Academic Year	2019 - 2020	
Course Faculty	Ms. K. Radhika, Assistant Professor Ms. P Navya, Assistant Professor	

COURSE OBJECTIVES:

The course should enable the students to:

I	Understand the role of database management system in an organization and learn the database concepts.
II	Design databases using data modelling and data normalization techniques.
III	Construct database queries using relational algebra and calculus.
IV	Understand the concept of a database transaction and related database facilities.
V	Learn how to evaluate set of queries in query processing.

DEFINITIONS AND TERMINOLOGY QUESTION BANK

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
UNIT-1						
1.	Define Data?	Data is a raw and unorganized fact that required to be processed to make it meaningful.	Remember	CO 1	CLO 1	ACS553.01
2.	What is DBMS used for?	is an application system whose main purpose revolves around the data. This is a system that allows its users to store the data, define it, retrieve it and update the information about the data inside the database	Remember	CO 1	CLO 1	ACS553.01

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
3.	What is Information?	Information is a set of data which is processed in a meaningful way according to the given requirement.	Remember	CO 1	CLO 1	ACS553.01
4.	What is meant by a Database??	A database is a logically coherent collection of data with some inherent meaning, representing some aspect of real world and which is designed, built and populated with data for a specific purpose.	Remember	CO 1	CLO 1	ACS553.01
5.	Define Database Management System?	It is a collection of programs that enables user to create and maintain a database. In other words it is general-purpose software that provides the users with the processes of defining, constructing and manipulating the database for various applications.	Remember	CO 1	CLO 1	ACS553.01
6.	What are the advantages of DBMS?	I. Redundancy is controlled. II. Providing multiple user interfaces. III. Providing backup and recovery IV. Unauthorized access is restricted. V. Enforcing integrity constraints.	Remember	CO 1	CLO 1	ACS553.01
7.	Define Database System?	The database and DBMS software together is called as Database system.	Remember	CO 1	CLO 1	ACS553.01
8.	What is File system?	A file system is a process that manages how and where data on storage disk, typically a hard disk drive (HDD), is stored, accessed and managed.	Remember	CO 1	CLO 1	ACS553.01
9.	Disadvantage in File Processing System?	Data redundancy & inconsistency. Difficult in accessing data. Data isolation. Data integrity. Concurrent access is not possible. Security Problems.	Remember	CO 1	CLO 1	ACS553.01
10.	Define Data abstraction?	Database systems are made-up of complex data structures. To ease the user interaction with database, the developers hide internal irrelevant details from users. This process of hiding irrelevant details from user is called data abstraction.	Remember	CO 1	CLO 2	ACS553.02

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
11.	What is Instance?	The data stored in database at a particular moment of time is called instance of database.	Remember	CO 1	CLO 2	ACS553.02
12.	What is Schema?	Design of a database is called the schema.	Remember	CO 1	CLO 2	ACS553.02
13.	Define Data Independence?	Data independence means that "The application is independent of the storage structure and access strategy of data". In other words, the ability to modify the schema definition in one level should not affect the schema definition in the next higher level	Remember	CO 1	CLO 2	ACS553.02
14.	State Conceptual design?	Conceptual design is the first stage in the database design process. The goal at this stage is to design a database that is independent of database software and physical details. The output of this process is a conceptual data model that describes the main data entities, attributes, relationships, and constraints of a given problem domain. This design is descriptive and narrative in form.	Remember	CO 1	CLO 2	ACS553.02
15.	State Relational Model?	Relational Model represents how data is stored in Relational Databases. A relational database stores data in the form of relations (tables).	Remember	CO 1	CLO 4	ACS553.04
16.	State ER Model?	ER model stands for an Entity-Relationship model. It is a high-level data model. This model is used to define the data elements and relationship for a specified system. It develops a conceptual design for the database.	Remember	CO 1	CLO 3	ACS553.03
17.	What is Entity?	It is a 'thing' in the real world with an independent existence.	Remember	CO 1	CLO 3	ACS553.03
18.	What is Attribute?	It is a particular property, which describes the entity.	Remember	CO 1	CLO 3	ACS553.03
19.	What is Relation?	Relation refers to a table in a relational model.	Remember	CO 1	CLO 4	ACS553.04
20.	What is Arity?	Number of columns in a relation.	Remember	CO 1	CLO 4	ACS553.04
21.	What is Cardinality?	Number of rows in a relation.	Remember	CO 1	CLO 4	ACS553.04
22.	State DBA?	A database administrator (DBA) directs or performs all activities related to maintaining a successful database environment.	Remember	CO 1	CLO 1	ACS553.01

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23.	State Integrity Constraints?	Integrity constraints provide a way of ensuring that changes made to the database by authorized users do not result in a loss of data consistency.	Remember	CO 1	CLO 9	ACS553.09
24.	Define Super key?	Super Key is the superset of primary key. The super key contains a set of attributes, including the primary key, which can uniquely identify any data row in the table.	Remember	CO 1	CLO 9	ACS553.09
25.	Define Candidate key?	The candidate keys in a table are defined as the set of keys that is minimal and can uniquely identify any data row in the table.	Remember	CO 1	CLO 9	ACS553.09
26.	Define Primary Key?	The primary key is selected from one of the candidate keys and becomes the identifying key of a table. It can uniquely identify any data row of the table.	Remember	CO 1	CLO 9	ACS553.09
27.	Define Foreign Key?	A foreign key is an attribute value in a table that acts as the primary key in another another. Hence, the foreign key is useful in linking together two tables. Data should be entered in the foreign key column with great care, as wrongly entered data can invalidate the relationship between the two tables.	Remember	CO 1	CLO 9	ACS553.09
28.	What is Transaction?	A transaction is a logical unit of database processing that includes one or more database access operations	Remember	CO 1	CLO 2	ACS553.02

UNIT-II

1.	Define Relational algebra?	Relational Algebra is procedural query language, which takes relation as input and generates relation as output. Relational algebra mainly provides theoretical foundation for relational databases and SQL.	Remember	CO 2	CLO 6	ACS553.06
2.	What is the purpose of SQL?	SQL stands for Structured Query Language whose main purpose is to interact with the relational databases in the form of inserting and updating/modifying the data in the database.	Remember	CO 2	CLO 6	ACS553.06
3.	List Relational algebra operations	Relational algebra operations are selection, projection, set operations, renaming, joins and division.	Remember	CO 2	CLO 6	ACS553.06

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4.	What is a selection operation?	The select operation selects tuples that satisfy a given predicate. It is denoted by sigma (σ). Notation: $\sigma_p(r)$	Remember	CO 2	CLO 6	ACS553.06
5.	What is a Projection operation?	This operation shows the list of those attributes that we wish to appear in the result. Rest of the attributes are eliminated from the table. It is denoted by Π . Notation: $\Pi_{A1, A2, An}(r)$	Remember	CO 2	CLO 6	ACS553.06
6.	List set operations	set operations are union, intersection and set difference	Remember	CO 2	CLO 6	ACS553.06
7.	What are Union operations?	Union is a binary relation. Suppose there are two tuples R and S. The union operation contains all the tuples that are either in R or S or both in R & S. It eliminates the duplicate tuples. It is denoted by \cup . Notation: $R \cup S$	Remember	CO 2	CLO 6	ACS553.06
8.	What are Intersection operations?	Intersection is a binary relation. Suppose there are two tuples R and S. The set intersection operation contains all tuples that are in both R & S. It is denoted by intersection \cap . Notation: $R \cap S$	Remember	CO 2	CLO 6	ACS553.06
9.	What is Set difference operations?	Set difference is a binary relation. Suppose there are two tuples R and S. The set intersection operation contains all tuples that are in R but not in S. It is denoted by intersection minus (-). Notation: $R - S$	Remember	CO 2	CLO 6	ACS553.06
10.	What is renaming operations?	The rename operation is used to rename the output relation. It is denoted by rho (ρ). Example: We can use the rename operator to rename STUDENT relation to STUDENT1. $\rho(\text{STUDENT1}, \text{STUDENT})$	Remember	CO 2	CLO 6	ACS553.06
11.	What is Cartesian product	The Cartesian product is used to combine each row in one table with each row in the other table. It is also known as a cross product. It is denoted by \times . Notation: $E \times D$	Remember	CO 2	CLO 6	ACS553.06
12.	What is joins operations?	A Join operation combines related tuples from different relations, if and only if a given join condition is satisfied. It is denoted by \bowtie .	Remember	CO 2	CLO 6	ACS553.06
13.	List join operations?	Natural join, Equi join, Inner join and outer join	Remember	CO 2	CLO 6	ACS553.06
14.	What is natural join operations?	A natural join is the set of tuples of all combinations in R and S that are equal on their common attribute names. It is denoted by \bowtie .	Remember	CO 2	CLO 6	ACS553.06

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15	What are division operations?	Division operator $A \div B$ can be applied if and only if: Attributes of B is proper subset of Attributes of A. The relation returned by division operator will have attributes = (All attributes of A – All Attributes of B) The relation returned by division operator will return those tuples from relation A which are associated to every B's tuple.	Remember	CO 2	CLO 6	ACS553.06
16	What is relational calculus?	Relational calculus is a non procedural query language, it uses mathematical predicate calculus.	Remember	CO 2	CLO 6	ACS553.06
17	What is domain relational calculus?	In domain relational calculus, filtering variable uses the domain of attributes. It uses logical connectives \wedge (and), \vee (or) and \neg (not). It uses Existential (\exists) and Universal Quantifiers (\forall) to bind the variable. Notation: { a1, a2, a3, ..., an P (a1, a2, a3, .. ,an)} Where a1, a2 are attributes P stands for formula built by inner attributes	Remember	CO 2	CLO 6	ACS553.06
18	What is tuple relational calculus?	The tuple relational calculus is specified to select the tuples in a relation. The result of the relation can have one or more tuples. In TRC, filtering variable uses the tuples of a relation. Notation: { T P (T) } or { T Condition (T) } Where T is the resulting tuples P(T) is the condition used to fetch T.	Remember	CO 2	CLO 6	ACS553.06
UNIT-III						
1	What is Data Definition Language?	Defines the different structures in a database. DDL statements create, alter, drop and truncate database objects such as tables, indexes, and users.	Remember	CO 3	CLO 7	ACS553.07
2	What is Data Manipulation Language?	DML statements are used for managing data within schema objects. DML statements are select, insert, update and delete	Remember	CO 3	CLO 7	ACS553.07
3	What is Transaction control language?	It is used to manage the changes made by DML-statements. TCL statements are commit, rollback and savepoint.	Remember	CO 3	CLO 7	ACS553.07

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
4	What is Data control Language?	It is used to control access to data stored in a database. DCL statements are grant and revoke.	Remember	CO 3	CLO 7	ACS553.07
5	What is the concept of sub-query in terms of SQL?	Sub-query is basically the query which is included inside some other query and can also be called as an inner query which is found inside the outer query.	Remember	CO 3	CLO 7	ACS553.07
6	Define Aggregate functions?	Aggregate functions compute a single result from a set of input values. Few functions are count, avg, max, min, sum	Remember	CO 3	CLO 7	ACS553.07
7	Define Group by and having clause?	An GROUP BY HAVING clause allows to group rows that have the same values and also with condition.	Remember	CO 3	CLO 7	ACS553.07
8	Define Order by clause?	An ORDER BY clause allows you to specify the order in which rows appear in the result set.	Remember	CO 3	CLO 7	ACS553.07
9	What is Normalization?	Normalization is a process of organizing the data in database to avoid data redundancy, insertion anomaly, update anomaly & deletion anomaly.	Remember	CO 3	CLO 8	ACS553.08
10	Define Decomposition?	Decomposition is a process of dividing a complex relation into simple sub relations.	Understand	CO 3	CLO 8	ACS553.08
11	Define Functional Dependency?	A functional dependency is a constraint between two sets of attributes in a relation from a database. It is a relationship that exists when one attribute uniquely determines another attribute.	Understand	CO 3	CLO 8	ACS553.08
12	What is redundancy?	Redundancy is defined as repetition of data in database.	Understand	CO 3	CLO 8	ACS553.08
13	What is Trigger	A trigger is a stored procedure in database which automatically invokes whenever a special event in the database occurs.	Understand	CO 3	CLO 8	ACS553.08
14	What is an Assertion	An assertion ensures a certain condition will always exist in the database.	Understand	CO 3	CLO 11	ACS553.11
15	Define Normal forms	Normal form is used to reduce redundancy from the database table. Types of normal forms are: 1NF,2NF,3NF,4NF and 5NF	Understand	CO 3	CLO 8	ACS553.08
16	Define 1 st normal form	A relation is in first normal form if and only if the domain of each attribute contains only atomic (indivisible) values, and the value	Understand	CO 3	CLO 8	ACS553.08

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		of each attribute contains only a single value from that domain.				
17	Define 2 nd normal form	The Second Normal Form states that it should meet all the rules of 1NF and there must be no partial dependences of any of the columns on the primary key.	Understand	CO 3	CLO 8	ACS553.08
18	Define 3 rd normal form	The Third Normal Form states that it should meet all the rules of second normal form. All no primary fields are dependent on the primary key.	Understand	CO 3	CLO 8	ACS553.08
19	Define 4 th normal form	The Fourth Normal Form states that it should meet all the rules of 3NF and there are no non-trivial multivalued dependencies other than a candidate key.	Understand	CO 3	CLO 8	ACS553.08
20	Define 5 th normal form	The Fifth Normal Form states that it should meet all the rules of 4NF and not contains any join dependency and joining should be lossless.	Understand	CO 3	CLO 8	ACS553.08
21	Define prime attributes	Prime attributes are attributes of the relation which exist in at least one of the possible candidate keys.	Understand	CO 3	CLO 8	ACS553.08
22	Define non-prime attributes	A non-prime attribute of R is an attribute that does not belong to any candidate	Understand	CO 3	CLO 8	ACS553.08
UNIT-IV						
1	Define transaction in DBMS.	A transaction is a unit of program execution that accesses and possibly updates various data items.	Remember	CO 4	CLO12	ACS553.12
2	State the property Atomicity of a Transaction.	Atomicity of a transaction is either all operations of the transaction are properly reflected in the database or none of them.	Understand	CO 4	CLO12	ACS553.12
3	What is effect Durability of Transaction?	Durability ensures that after a transaction completes successfully, the changes it has made to the database persist, even if there are system failures	Remember	CO 4	CLO12	ACS553.12
4	Indicate the importance of Isolation property of a Transaction.	Although multiple transactions may execute concurrently, each transaction must be unaware of other concurrently executing transactions and result as it is executing alone.	Understand	CO 4	CLO12	ACS553.12

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
5	How Consistency of a transaction preserved?	Execution of a transaction in isolation preserves the consistency of the database.	Remember	CO 4	CLO13	ACS553.13
6	What is the responsibility of Recovery Management component?	The recovery-management component of a database system implements the support for atomicity and durability.	Remember	CO 4	CLO13	ACS553.13
7	Define Schedule of transactions.	Schedule is a sequences of instructions that specify the chronological order in which all instructions of concurrent transactions are executed	Remember	CO 4	CLO12	ACS553.12
8	Define a serializable Schedule.	A (possibly concurrent) schedule is serializable if it is equivalent to a serial schedule	Remember	CO 4	CLO13	ACS553.13
9	When a schedule is View serializable?	A schedule S is view serializable if it is view equivalent to a serial schedule.	Remember	CO 4	CLO13	ACS553.13
10	When two instructions are conflict to each other?	Instructions l_i and l_j of transactions T_i and T_j respectively, conflict if and only if there exists some item Q accessed by both l_i and l_j , and at least one of these instructions wrote Q.	Remember	CO 4	CLO12	ACS553.12
11	Define Recoverable schedule .	A schedule is recoverable if a transaction T_j reads a data item previously written by a transaction T_i , then the commit operation of T_i appears before the commit operation of T_j .	Remember	CO 4	CLO13	ACS553.13
12	Define a Cascadeless schedules.	A Schedule is Cascadeless schedules in which cascading rollbacks cannot occur; for each pair of transactions T_i and T_j such that T_j reads a data item previously written by T_i , the commit operation of T_i appears before the read operation of T_j	Remember	CO 4	CLO13	ACS553.13
13	What is purpose of Lock in Lock based protocols?	A lock is a mechanism to control concurrent access to a data item	Remember	CO 4	CLO13	ACS553.13
14	Distinguish between Exclusive and Shared lock.	In requesting for Exclusive Lock on a Data item then it can be used for both read as well as to write whereas A shared lock can be requested on a Data item if it can used only to read.	Understand	CO 4	CLO13	ACS553.13
15	Express what is locking protocol.	A locking protocol is a set of rules followed by all transactions	Understand	CO 4	CLO13	ACS553.13

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
		while requesting and releasing locks. Locking protocols restrict the set of possible schedules.				
16	State the functions of Growing Phase in two phase locking protocol.	In Growing Phase of locking protocol, a transaction may obtain locks and transaction may not release locks	Remember	CO 4	CLO13	ACS553.13
17	State the functions of Shrinking Phase in two phase locking protocol.	In Shrinking Phase of two phase locking protocol a transaction may release locks and transaction may not obtain locks	Remember	CO 4	CLO13	ACS553.13
18	Identify when a Transaction system is in dead lock state?	Transaction System is deadlocked if there is a set of transactions such that every transaction in the set is waiting for another transaction in the set.	Understand	CO 4	CLO12	ACS553.12
19	What is transaction failure?	Transaction failure may be because of logical errors or systems errors. Logical errors: transaction cannot complete due to some internal error condition System errors: the database system must terminate an active transaction due to an error condition (e.g., deadlock)	Remember	CO 4	CLO12	ACS553.12
20	Distinguish physical blocks from buffer blocks.	Physical blocks are those blocks residing on the disk. Buffer blocks are the blocks residing temporarily in main memory.	Understand	CO 4	CLO12	ACS553.12
21	What is log and log record?	A log is kept on stable storage. The log is a sequence of log records, and maintains a record of update activities on the database.	Remember	CO 4	CLO13	ACS553.13
22	Describe deferred database modification.	The deferred database modification scheme records all modifications to the log, but defers all the writes to after partial commit.	Remember	CO 4	CLO13	ACS553.13
23	Describe immediate database modification.	The immediate database modification scheme allows database updates of an uncommitted transaction to be made as the writes are issued since undoing may be needed, update logs must have both old value and new value	Remember	CO 4	CLO13	ACS553.13

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24	What is blind write?	If a transaction has write instruction on a attribute without having read instruction on the same data item is known as blind write.	Remember	CO 4	CLO13	ACS553.13
25	What is dual paging problems?	When database decides to write buffer page to disk, buffer page may be in swap space, and may have to be read from swap space on disk and output to the database on disk. This results in extra I/O and is Known as dual paging problem.	Remember	CO 4	CLO13	ACS553.13
UNIT-V						
1	State the functions of Growing Phase in two phase locking protocol.	In Growing Phase of locking protocol, a transaction may obtain locks and transaction may not release locks	Remember	CO 5	CLO13	ACS553.13
2	State the functions of Shrinking Phase in two phase locking protocol.	In Shrinking Phase of two phase locking protocol a transaction may release locks and transaction may not obtain locks	Remember	CO 5	CLO13	ACS553.13
3	Identify when a Transaction system is in dead lock state?	Transaction System is deadlocked if there is a set of transactions such that every transaction in the set is waiting for another transaction in the set.	Understand	CO 5	CLO12	ACS553.12
4	What is Immediate modification?	The Immediate modification technique occurs if database modification occurs while the transaction is still active	Remember	CO 5	CLO12	ACS553.12
5	What is Growing Phase?	New locks on data items may be acquired but none can be released.	Remember	CO 5	CLO12	ACS553.12
6	What is Shrinking Phase?	Existing locks may be released but no new locks can be acquired.	Remember	CO 5	CLO12	ACS553.12
7	What is Granularity?	It is the size of data item allowed to lock	Remember	CO 5	CLO12	ACS553.12
8	What is Intention-Shared (IS)?	Explicit locking at a lower level of the tree but only with shared locks	Remember	CO 5	CLO12	ACS553.12
9	What is Intention-Exclusive (IX)?	explicit locking at a lower level with exclusive or shared locks	Remember	CO 5	CLO12	ACS553.12
10	What is Shared & Intention-Exclusive (SIX)?	the sub-tree rooted by that node is locked explicitly in shared mode and explicit locking is being done at a lower level with exclusive mode locks.	Remember	CO 5	CLO12	ACS553.12

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11	What is Timestamp?	Timestamp is a unique identifier created by the DBMS to identify a transaction. They are usually assigned in the order in which they are submitted to the system.	Understand	CO 5	CLO12	ACS553.12
12	Define Timestamp Ordering Protocol?	The main idea for this protocol is to order the transactions based on their Timestamps. A schedule in which the transactions participate is then serializable and the only equivalent serial schedule <i>permitted</i> has the transactions in the order of their Timestamp Values.	Understand	CO 5	CLO12	ACS553.12
13	What is log?	The log is a sequence of records. Log of each transaction is maintained in some stable storage so that if any failure occurs, then it can be recovered from there.	Understand	CO 5	CLO12	ACS553.12
14	What is deferred modification?	The deferred modification technique occurs if the transaction does not modify the database until it has committed	Remember	CO 5	CLO12	ACS553.12

Prepared by:

Ms. K Radhika, Assistant Professor

HOD, EEE