INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad - 500 043

INFORMATION TECHNOLOGY

DEFINITIONS AND TERMINOLOGY QUESTION BANK

Course Name	:	**ADVANCED DATABASES**
Course Code	:	**AIT505**
Program	:	B.Tech
Semester	:	**V**
Branch	:	**IT**
Section	:	**A & B**
Academic Year	:	**2019 - 2020**
Course Faculty	:	**Mr. D. Rahul, Assistant Professor** **Mr. N. Bhaswanth, Assistant Professor**

COURSE OBJECTIVES:

The course should enable the students to:	
I	Define entity relationship model and transaction processing system.
II	Understand various storage structures for database.
III	Describe the distributed and parallel database processing.
IV	Describe object oriented database concepts and models.
V	Understand various advancements in database technology

DEFINITIONS AND TERMINOLOGY QUESTION BANK

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
UNIT - I						
1	What is an active database?	Active databases provide a facility, tightly integrated with the database system software, for creating and executing production rules.	Understand	CO 1	CLO1	CAIT505.01
2	What is active rule engine?	The processing of rules is performed by an active rule engine, which monitors events caused by database transactions and schedules rules according to given policies.	Understand	CO 1	CLO2	CAIT505.02
3	What is Starburst	Starburst is the name of a project developed at the IBM Almaden Research Center; an active database extension developed in this framework, called the Starburst Active Rule System, has gained popularity mainly because of its simple syntax and semantics.	Understand	CO 1	CLO3	CAIT505.03
4	What is Triggers in Oracle	Triggers in Oracle may execute actions that contain arbitrary PL/SQL code; this feature makes	Understand	CO 1	CLO1	CAIT505.01

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		triggers in Oracle particularly powerful and expressive				
5	What is Triggers in DB2	Triggers for DB2 Common Servers were recently defined at the IBM Alma den Research Center; efforts were focused on giving to triggers a precise, unambiguous semantics,.	Understand	CO 1	CLO1	CAIT505.01
6	Define events in Active Database	The typical events considered by active rules are primitives for database state changes; several systems can also monitor retrievals, some systems monitor time-related events (e.g., at 5 p.m., every Friday)	Understand	CO 1	CLO3	CAIT505.03
7	What is Integrity Management	Integrity maintenance is the most significant internal application. Constraints are expressed declaratively through predicates, also called integrity rules, that give a specification of the conditions that must hold on the Database.	Remember	CO 1	CLO3	CAIT505.03
8	Define Built-in Constraints	Built-in constraints are fixed; they are specified by special language Constructs of the data definition language. In relational databases, these include keys, unique attributes, not null attributes, and referential integrity, all of which are allowed.	Understand	CO 1	CLO3	CAIT505.03
9	What is work flow management	The workflow management paradigm is a reactive one: workflow managers monitor the events that occur in the system and then perform the Required event management activities.	Understand	CO 1	CLO3	CAIT505.03
10	Define Business Rules	Business rules model the reaction to events that occur in the real world, with tangible side effects on the database content, so as to encapsulate the application's reactive behavior to such events.	Understand	CO 1	CLO2	CAIT505.02
11	Define Rule Modularization	Modularization is a key design principle in software design. It enables the designer to focus on subsets of the original problem, thus partitioning a large design space; in software engineering, modularization enables the separation of programming.	Understand	CO 1	CLO3	CAIT505.03
12	Define Behavioral stratification	Behavioral stratification associates each stratum to a particular applicative task; each stratum is responsible for performing the task	Understand	CO 1	CLO3	CAIT505.03
13	Define Assertional stratification	Assertional stratification associates each rule to an assertion, called the stratum's post condition. Global termination requires that interleaved executions of rules from different strata do not compromise	Understand	CO 1	CLO3	CAIT505.03

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		the post conditions that were already established.				
14	Define Event stratification	Event-based stratification defines a stratum in terms of the input / Output relationship between its triggering events and its actions.	Understand	CO 1	CLO3	CAIT505.03
15	What is Idea Methodology	The IDEA Methodology reconciles deductive and active rules by assigning them the role of expressing knowledge about the application domain, either with a purely declarative style or with a more procedural style.	Understand	CO 1	CLO3	CAIT505.03
UNIT - II						
1	Define Temporal Databases	A temporal database is one that supports some aspect of time. It has more specific characterizations that concern the kinds of time supported.	Understand	CO2	CLO4	CAIT505.04
2	What is Time Domain	Models of time in a temporal logic represent time as an arbitrary set of instants with an imposed partial order. Additional axioms introduce other, more refined models of time	Understand	CO2	CLO4	CAIT505.04
3	Define Valid Time	Valid time concerns the time a fact was true in reality. The valid time of an event is the time at which the event occurred in the real world, indepen dent of the recording of that event in some database.	Remember	CO2	CLO5	CAIT505.05
4	Define Transaction Time	Transaction time concerns the time the fact was present in the database as stored data.	Remember	CO2	CLO5	CAIT505.05
5	What is Time Ontology	The TSQL2 time line is a discrete representation of the real time line, which can be considered to be discrete, dense, or continuous. The TSQL2 time line consists of atomic (nondecomposable) chronons.	Understand	CO2	CLO6	CAIT505.06
6	Define Data Model	Data model retains the simplicity and generality of the relational model. It has no illusions of being suitable for presentation, storage, or query evaluation.	Understand	CO2	CLO6	CAIT505.06
7	Define BCDM	Bitemporal Conceptual Data Model (BCDM), timestamps tuples with bitemporal elements, which are sets of bitemporal chronons. Each bitemporal chronon represents a tiny rectangle in valid-time/transaction-time space.	Understand	CO2	CLO4	CAIT505.04
8	Define Restructuring	Most powerful constructs of TSQL2 is restructuring. Whereas TSQL2 automatically performs coalescing on the result of a query, restructuring in the FROM clause allows coalescing to be performed	Understand	CO 2	CLO4	CAIT505.04

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		on the underlying tuples.				
9	Define Event Relations	Event relations record instantaneous events. Event relations are timestamped with instant sets, which are simply sets of instants. Each tuple identifies a particular kind of event, and the timestamp of that tuple specifies the instants when that event occurred.	Understand	CO 2	CLO5	CAIT505.05
10	Define Schema Evolution	SQL permits the schema to be changed by using the ALTER statement, termed schema evolution. Only one schema is in effect at any time; a schema change causes the previous schema to be lost.	Understand	CO 2	CLO5	CAIT505.05
11	Define Query Compiler	Users prepare queries, either ad hoc or embedded in procedural code, which are submitted to the query compiler. The query is first lexically and syntactically analyzed, using information from the systemcatalog, thenoptimized for efficient execution.	Understand	CO 2	CLO5	CAIT505.05
12	Define Data Dictionary	The data dictionary records schema information such as file structure and format, the number and types of attributes in a table, integrity constraints, and associated indexes.	Remember	CO 2	CLO6	CAIT505.06
13	What is DDL compiler	The DDL compiler translates TSQL2 CREATE and ALTER statements into executable transactions. Each of these statements affects both the data Dictionary and the data files.	Remember	CO 2	CLO6	CAIT505.06
14	Define Query execution plan	The query compiler translates TSQL2 data manipulation language (DML) statements into an executable, and semantically equivalent, internal form called the query execution plan	Understand	CO 2	CLO5	CAIT505.05
15	Define Run time evalutor	The run-time evaluator interprets a query plan produced by the query compiler. The run-time evaluator calls the transaction and data manager to retrieve data from the data dictionary and data files.	Understand	CO 2	CLO6	CAIT505.06
UNIT - III						
1	Define Union	The union of relations R and S, denoted R U S, is the set of tuples that are in R, or in S, or in both.	Remember	CO 3	CLO 8	CAIT505.8
2	Define Set Difference	The difference of relations R and S, denoted R - S, is the set of tuples that belong to R but not to S.	Remember	CO 3	CLO 8	CAIT505.8
3	Define Cartesian Product	The Cartesian product of R and S is denoted R x S. If R has n columns	Remember	CO 3	CLO 9	CAIT505.9

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		and S has m columns, then R x S contains all the possible m + n tuples whose first m components form a tuple in R and the last n components form a tuple in S.				
4	Define Connectives	These include basic logical connectives and the implication symbols.	Remember	CO 3	CLO 7	CAIT505.7
5	What is Constructive Semantics	A constructive semantics follows from viewing rules as constructive derivation patterns, whereby,from the tuples that satisfy the patterns specified by the goals in a rule, we construct the corresponding head atoms.	Understand	CO 3	CLO 9	CAIT505.9
6	What is rule rewriting methods	A better approach is to transform the original RA expression by pushing selection into the expression as is currently done by query optimizers in relational databases.	Understand	CO 3	CLO 8	CAIT505.8
7	What is magic sets	The basic idea of magic sets is to emulate the top-down binding passing using rules to be executed in a bottom-upfashion	Remember	CO 3	CLO 7	CAIT505.7
8	Define Query Rewriting	Query Rewriting is a typically automatic transformation that takes a set of database tables, views and/or queries, usually indices, often gathered data and query statistics, and other metadata, and yields a set of different queries, which produce the same results but execute with better performance (for example, faster, or with lower memory use)	Remember	CO 3	CLO 8	CAIT505.8
9	Define Relational Algebra	Relational algebra is a procedural query language. It gives a step by step process to obtain the result of the query. It uses operators to perform queries.	Remember	CO 3	CLO 9	CAIT505.9
10	Describe Tuple Relational Calculus (TRC)	The tuple relational calculus is specified to select the tuples in a relation. In TRC, filtering variable uses the tuples of a relation.The result of the relation can have one or more tuples. { T.name | Author(T) AND T.articl e = 'database' }	Remember	CO 3	CLO 9	CAIT505.9
11	Describe Domain Relational Calculus (DRC)	The second form of relation is known as Domain relational calculus. In domain relational calculus, filtering variable uses the domain of attributes. { a1, a2, a3, ..., an | P (a1, a2, a3, ... ,an)}	Remember	CO 3	CLO 8	CAIT505.8

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12	Explain the Project Operation	This operation shows the list of those attributes that we wish to appear in the result. Rest of the attributes is eliminated from the table. It is denoted by ∏.	Understand	CO 3	CLO 8	CAIT505.8
13	Explain the 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 X.	Understand	CO 3	CLO 9	CAIT505.9
14	Explain the Rename Operation.	The rename operation is used to rename the output relation. It is denoted by rho (ρ).	Understand	CO 3	CLO 7	CAIT505.7
15	What is Recursive Predicates	The treatment of recursive predicates is somewhat more complex because a choice of recursive methods must be performed along with the binding passing analysis	Understand	CO 3	CLO 7	CAIT505.7
UNIT - IV						
1	Define Secondary Key.	An entity may have one or more choices for the primary key. Collectively these are known as candidate keys. One is selected as the primary key. Those not selected are known as secondary keys.	Remember	CO 4	CLO 10	CAIT505.10
2	Describe the Inverted Files	In data management, a file that is indexed on many of the attributes of the data itself. For example, in an employee file, an index could be maintained for all secretaries, another for managers. It is faster to search the indexes than every record. Also known as "inverted lists," inverted file indexes use a lot of disk space; searching is fast, updating is slower.	Remember	CO 4	CLO 12	CAIT505.12
3	Write grid file	A grid file is usually used in cases where a single value can be referenced by multiple keys.	Remember	CO 4	CLO 10	CAIT505.10
4	Define the k-d tree	a k-d tree (short for k-dimensional tree) is a space-partitioning data structure for organizing points in a k-dimensional space. k-d trees are a useful data structure for several applications, such as searches involving a multidimensional search key (e.g. range searches and nearest neighbor searches). k-d trees are a special case of binary space partitioning trees.	Remember	CO 4	CLO 11	CAIT505.11
5	Define B-tree	B-tree is a method of placing and locating files (called records or keys) in a database. (The meaning of the letter B has not been	Remember	CO 4	CLO 12	CAIT505.12

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		explicitly defined.) The B-tree algorithm minimizes the number of times a medium must be accessed to locate a desired record, thereby speeding up the process.				
6	Illustrate Multimedia database	Multimedia database is the collection of interrelated multimedia data that includes text, graphics (sketches, drawings), images, animations, video, audio etc and have vast amounts of multisource multimedia data. The framework that manages different types of multimedia data which can be stored, delivered and utilized in different ways is known as multimedia database management system.	Understand	CO 4	CLO 11	CAIT505.11
7	Explain the classes of the multimedia database	There are three classes of the multimedia database which includes static media, dynamic media and dimensional media.	Understand	CO 4	CLO 10	CAIT505.10
8	Describe the Repository application in multimedia database	A Large amount of multimedia data as well as meta-data(Media format date, Media keyword data, Media feature data) that is stored for retrieval purpose, e.g., Repository of satellite images, engineering drawings, radiology scanned pictures.	Remember	CO 4	CLO 11	CAIT505.11
9	Define R-trees	R-trees are tree data structures used for spatial access methods, i.e., for indexing multi-dimensional information such as geographical coordinates, rectangles or polygons.	Understand	CO 4	CLO 12	CAIT505.12
10	Illustrate the Vector space model	Vector space model or term vector model is an algebraic model for representing text documents (and any objects, in general) as vectors of identifiers, such as, for example, index terms. It is used in information filtering, information retrieval, indexing and relevancy rankings. Its first use was in the SMART Information Retrieval System.		CO 4	CLO 11	CAIT505.11
11	Define Clustering	Clustering, in the context of databases, refers to the ability of several servers or instances to connect to a single database. An instance is the collection of memory and processes that interacts with a database, which is the set of physical files that actually store data.	Understand	CO 4	CLO 10	CAIT505.10
12	Define GEMINI	GEMINI, a generic approach to achieve fast searching in multimedia databases.	Remember	CO 4	CLO 12	CAIT505.12

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13	Explain the database index	A database index is a data structure that improves the speed of data retrieval operations on a database table at the cost of additional writes and storage space to maintain the index data structure.	Understand	CO 4	CLO 11	CAIT505.11
14	Illustrate Presentation applications	They involve delivery of multimedia data subject to temporal constraint. Optimal viewing or listening requires DBMS to deliver data at certain rate offering the quality of service above a certain threshold. Here data is processed as it is delivered. Example: Annotating of video and audio data, real-time editing analysis.	Understand	CO 4	CLO 11	CAIT505.11
15	Define Queries and retrieval	For multimedia data like images, video, audio accessing data through query opens up many issues like efficient query formulation, query execution and optimization which need to be worked upon.	Remember	CO 4	CLO 12	CAIT505.12
UNIT - V						
1	Define the Uncertain data	Uncertain data is data that contains noise that makes it deviate from the correct, intended or original values. In the age of big data, uncertainty or data veracity is one of the defining characteristics of data. Data is constantly growing in volume, variety, velocity and uncertainty (1/veracity).	Remember	CO 5	CLO 13	CAIT505.13
2	List the Models of Uncertainty	There are three types models Fuzzy Sets, Fuzzy Logic, Triangular Norms and Conorms.	Understand	CO 5	CLO 15	CAIT505.15
3	Explain the Fuzzy database	If a regular or classical database is a structured collection of information (records or data) stored in a computer, a fuzzy database is a database which is able to deal with uncertain or incomplete information using fuzzy logic.	Understand	CO 5	CLO 13	CAIT505.13
4	Define Rational ignorance	Rational ignorance means intentionally choosing to remain uninformed on a topic because the cost of acquiring the information is greater than the estimated potential benefits.	Remember	CO 5	CLO 14	CAIT505.14
5	Describe Relation Data Model	Relational data model is the primary data model, which is used widely around the world for data storage and processing. This model is simple and it has all the properties and capabilities required to process data with storage efficiency.	Remember	CO 5	CLO 13	CAIT505.13

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6	Define the Tuple	In relational data model, relations are saved in the format of Tables. This format stores the relation among entities. A table has rows and columns, where rows represent records and columns represent the attributes.	Remember	CO 5	CLO 15	CAIT505.15
7	Explain the Key Constraints	There must be at least one minimal subset of attributes in the relation, which can identify a tuple uniquely. This minimal subset of attributes is called key for that relation. If there are more than one such minimal sub sets, these are called candidate keys.	Understand	CO 5	CLO 14	CAIT505.14
8	Describe the Clustering Index	Clustering index is defined on an ordered data file. The data file is ordered on a non-key field.	Remember	CO 5	CLO 15	CAIT505.15
9	Define Sparse Index	In sparse index, index records are not created for every search key. An index record here contains a search key and an actual pointer to the data on the disk.	Remember	CO 5	CLO 13	CAIT505.13
10	Define Primary Index	Primary index is defined on an ordered data file. The data file is ordered on a key field. The key field is generally the primary key of the relation.	Remember	CO 5	CLO 15	CAIT505.15
11	Explain the Multilevel Index	Index records comprise search-key values and data pointers. Multilevel index is stored on the disk along with the actual database files. As the size of the database grows, so does the size of the indices.	Understand	CO 5	CLO 15	CAIT505.15
12	Define attribute	an attribute is a characteristic. In a database management system (DBMS), an attribute refers to a database component, such as a table. It also may refer to a database field. Attributes describe the instances in the row of a database.	Remember	CO 5	CLO 14	CAIT505.14
13	Describe the relational database	A relational database is a set of formally described tables from which data can be accessed or reassembled in many different ways without having to reorganize the database tables. The standard user and application programming interface (API) of a relational database is the Structured Query Language (SQL). SQL statements are used both for interactive queries for information from a relational database and for gathering data for reports.	Remember	CO 5	CLO 13	CAIT505.13
14	Define Constraints	Constraints are the rules enforced on the data columns of a table. These are used to limit the type of data that can go into a table. This	Remember	CO 5	CLO 14	CAIT505.14

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		ensures the accuracy and reliability of the data in the database.				
15	Explain the Integrity Constraints	Integrity constraints are used to ensure accuracy and consistency of the data in a relational database. Data integrity is handled in a relational database through the concept of referential integrity.	Understand	CO 5	CLO 14	CAIT505.14

Signature of the Faculty **HOD, IT**