

SRM VALLIAMMAI ENGINEERING COLLEGE

SRM Nagar, Kattankulathur – 603 203.

(An Autonomous Institution)

DEPARTMENT OF COMPUTER APPLICATIONS

QUESTION BANK



I SEMESTER

MC4162 ADVANCED DATABASE TECHNOLOGY

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Prepared by

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SRM Nagar, Kattankulathur-603203
DEPARTMENT OF COMPUTER APPLICATIONS



QUESTION BANK

SUBJECT : MC4162 ADVANCED DATABASE TECHNOLOGY

SEM / YEAR: III / II

UNIT I DISTRIBUTED DATABASE				
Distributed Systems – Introduction – Architecture – Distributed Database Concepts – Distributed Data Storage – Distributed Transactions – Commit Protocols – Concurrency Control – Distributed Query Processing				
Q.No.	Question	Bloom's Taxonomy Level	Competence	Course Outcome
PART – A				
1.	Define Distributed Databases.	BTL1	Remembering	CO1
2.	List the advantages of Distributed Databases.	BTL1	Remembering	CO1
3.	Choose one issue in Distributed Databases model and justify it.	BTL2	Understanding	CO1
4.	What is Distributed Systems?	BTL1	Remembering	CO1
5.	Why Commit Protocols is needed?	BTL2	Understanding	CO1
6.	Define Concurrency Control.	BTL1	Remembering	CO1
7.	What are the main components you need to build a Distributed Systems?	BTL1	Remembering	CO1
8.	Construct a brief outline of the steps involved in Distributed Query Processing.	BTL2	Understanding	CO1
9.	Compare Distributed Database and Centralized Database.	BTL2	Understanding	CO1
10.	Define transaction.	BTL1	Remembering	CO1
11.	List the reasons for allowing concurrency.	BTL1	Remembering	CO1
12.	When should you choose roll back a transaction?	BTL2	Understanding	CO1
13.	What is the term aborted state?	BTL1	Remembering	CO1
14.	Mention the properties of transaction.	BTL1	Remembering	CO1
15.	What are the different modes of lock?	BTL1	Remembering	CO1
16.	List the phases of two-phase locking protocol.	BTL1	Remembering	CO1
17.	Classify the states of transaction.	BTL1	Remembering	CO1
18.	State the need for concurrency.	BTL1	Remembering	CO1
19.	Define Save point.	BTL1	Remembering	CO1
20.	What are the steps of query processing?	BTL1	Remembering	CO1
21.	Define the concept of ACID.	BTL1	Remembering	CO1
22.	State an example of deadlock.	BTL1	Remembering	CO1
23.	When is a transaction said to be deadlocked?	BTL2	Understanding	CO1
24.	Construct an example for concurrent execution of transaction.	BTL2	Understanding	CO1

25.	A transaction updates accounts stored at two different servers. Why is a commit protocol required in this situation?	BTL2	Understanding	CO1
PART – B				
1.	Explain the architecture styles in Distributed Systems and how they are used in simple terms.	BTL3	Applying	CO1
2.	Analyze the functions of Layered Architecture in Distributed System, advantages, and disadvantages.	BTL4	Analyzing	CO1
3.	Compare P2P Architecture and Data-Centric Architecture in Distributed Systems by outlining their main differences and provide an example for each to illustrate the contrast.	BTL4	Analyzing	CO1
4.	How tasks and services are distributed across different entities within Client Server Architecture in Distributed Systems model? Give a brief overview of its key principles.	BTL3	Applying	CO1
5.	Explain the types of Distributed Databases with examples to make it easy to understand.	BTL5	Evaluating	CO1
6.	How does data stored on several places in two ways using distributed data storage? Use simple language to describe its impact.	BTL3	Applying	CO1
7.	(i) What is the need for a Distributed Transaction? (4) (ii) Explain the working of Distributed Transactions with neat diagram. (12)	BTL3	Applying	CO1
8.	Explain the following:(8+8) (i) Three-Phase Commit Protocol (3PC) (ii) XA Transactions.	BTL4	Analyzing	CO1
9.	Describe the types of Distributed Transactions.	BTL3	Applying	CO1
10.	Discuss about the Two-Phase Commit Protocol (2PC).	BTL3	Applying	CO1
11.	Solve a real-world problem by choosing an application, explaining what type of Distributed Transactions is suitable, and describing how it can be applied.	BTL3	Applying	CO1
12.	Outline the basic steps involved in the Distributed Query Processing and explain why each step is crucial for the model's success.	BTL3	Applying	CO1
13.	Compare the performance of various Commit Protocols.	BTL4	Analyzing	CO1
14.	(i) List the Advantages and Disadvantages of Concurrency (10) (ii) Difference between Serial Schedule and Serializable Schedule.(6)	BTL3	Applying	CO1
15.	Compare and contrast the "what" and "how" how the concurrency control techniques are implemented in a distributed database system.	BTL4	Analyzing	CO1
16.	(i) What are the Applications of Distributed Transactions?(6) (ii) Consider a distributed transaction (T) in which a customer transfers :Rs. 105 from account A to account C and Subsequently, Rs. 205 from account B to account D. Explain it with concurrent execution of the sub-transactions.(10)	BTL3	Applying	CO1

17.	Evaluate the two phase locking protocol and give clear examples to illustrate your points.	BTL5	Evaluating	CO1
18.	Student information is stored at different campus databases. A university administrator wants to generate a report combining student data from all campuses. Explain how distributed query processing and query optimization can be used.	BTL5	Evaluating	CO1

UNIT II SPATIAL AND TEMPORAL DATABASES

Active Databases Model – Design and Implementation Issues - Temporal Databases - Temporal Querying - Spatial Databases: Spatial Data Types, Spatial Operators and Queries – Spatial Indexing and Mining – Applications – Mobile Databases: Location and Handoff Management, Mobile Transaction Models – Deductive Databases - Multimedia Databases.

Q.No.	Question	Bloom's Taxonomy Level	Competence	Course Outcome
PART – A				
1.	Define Active database model.	BTL1	Remembering	CO2
2.	Write the design issues of Active database model.	BTL1	Remembering	CO2
3.	State the implementation issues of Active database model.	BTL1	Remembering	CO2
4.	What is temporal data type?	BTL1	Remembering	CO2
5.	Expand the term TQL.	BTL2	Understanding	CO2
6.	List the advantages of temporal database.	BTL1	Remembering	CO2
7.	What are the disadvantages of the temporal database.	BTL1	Remembering	CO2
8.	Write any two Limitations of TQL.	BTL1	Remembering	CO2
9.	Why do we need TQL?	BTL2	Understanding	CO2
10.	Mention any two examples of temporal data.	BTL1	Remembering	CO2
11.	How does TQL differ from SQL?	BTL2	Understanding	CO2
12.	What are temporal data types in TQL?	BTL1	Remembering	CO2
13.	List the characteristics of Spatial Database.	BTL1	Remembering	CO2
14.	Distinguish between Vector data and Raster data.	BTL2	Understanding	CO2
15.	What is Spatial Data Mining?	BTL1	Remembering	CO2
16.	What are the primitives of spatial data mining?	BTL1	Remembering	CO2
17.	What are the clustering methods for spatial data mining?	BTL1	Remembering	CO2
18.	Why is handoff used?	BTL2	Understanding	CO2
19.	Where are mobile databases used?	BTL2	Understanding	CO2
20.	Differentiate between active and deductive database,	BTL2	Understanding	CO2
21.	Specify the Applications of Commercial Deductive Database Systems.	BTL1	Remembering	CO2
22.	Where is the multimedia database used?	BTL2	Understanding	CO2
23.	Mention the characteristics of multimedia data.	BTL1	Remembering	CO2
24.	Which database system is used in multimedia?	BTL2	Understanding	CO2
25.	A mobile user moves from one cellular network to another while performing a database transaction. Which mobile database mechanism manages this situation?	BTL-2	Understanding	CO 2
PART –B				
1.	Explain about triggers and active databases in DBMS.	BTL3	Applying	CO2
2.	(i) What are Temporal Databases? (7) (ii) How databases automatically retain history (temporal data).(9)	BTL3	Applying	CO2

3.	Explain about the temporal query processing architecture.	BTL3	Applying	CO2												
4.	Discuss the different methods used to implement the temporal databases.	BTL3	Applying	CO2												
5.	With neat description explain about features of TQL.	BTL4	Analyzing	CO2												
6.	(i) Evaluate the Types of Operations involved in spatial databases.(6) (ii) Discuss briefly about the Spatial Index and Spatial Query.(10)	BTL5	Evaluating	CO2												
7.	Explain about the Spatial Data Types with examples.	BTL3	Applying	CO2												
8.	Explain about Spatial Operators with example.	BTL3	Applying	CO2												
9.	Explain the basic Spatial Query Operators.	BTL3	Applying	CO2												
10.	Illustrate with an Example for Spatial Query step by step procedure.	BTL6	Creating	CO2												
11.	Evaluate the location and handoff management in mobile database	BTL5	Evaluating	CO2												
12.	Discuss about the transaction processing in Mobile Environment.	BTL3	Applying	CO2												
13.	Evaluate the Deductive Database Semantics and Query.	BTL5	Evaluating	CO2												
14.	(i) Discuss about the content of Multimedia Database management system .(6) (ii) Briefly write about the types of multimedia applications based on data management characteristics.(10)	BTL3	Applying	CO2												
15.	Outline the significance of Deductive Databases and highlighting their impact on DBMS.	BTL3	Applying	CO2												
16.	Compare the Spatial Databases and temporal Databases.	BTL5	Evaluating	CO2												
17.	The definition of the polygonal municipality boundaries(bc_municipality) table is: <table><tr><th>Column</th><th>Type</th><th>Description</th></tr><tr><td>gid</td><td>integer</td><td>Unique ID code</td></tr><tr><td>name</td><td>character varying</td><td>City / Town Name</td></tr><tr><td>geom</td><td>geometry</td><td>Location</td></tr></table> Geometry (Polygon) Develop a query for the following: (i) How large is the city of Prince George, in hectares? (ii) What is the largest municipality in the province, by area?	Column	Type	Description	gid	integer	Unique ID code	name	character varying	City / Town Name	geom	geometry	Location	BTL5	Evaluating	CO2
Column	Type	Description														
gid	integer	Unique ID code														
name	character varying	City / Town Name														
geom	geometry	Location														
18.	A food delivery application tracks delivery agents using smartphones. Explain how location management, handoff management, and mobile transaction models can be used to maintain reliable database operations.	BTL-6	Creating	CO 2												

UNIT III NOSQL DATABASES				
NoSQL – CAP Theorem – Sharding - Document based – MongoDB Operation: Insert, Update, Delete, Query, Indexing, Application, Replication, Sharding–Cassandra: Data Model, Key Space, Table Operations, CRUD Operations, CQL Types – HIVE: Data types, Database Operations, Partitioning – HiveQL – OrientDB Graph database – OrientDB Features				
Q.No.	Question	Bloom's Taxonomy Level	Competence	Course Outcome
PART – A				
1	What is the most popular NoSQL database?	BTL 1	Remembering	CO3
2	Difference between NoSQL and SQL.	BTL 2	Understanding	CO3
3	What are the two types of sharding?	BTL 1	Remembering	CO3
4	Define the term pooling.	BTL 1	Remembering	CO3
5	Mention any two NoSQL database.	BTL 1	Remembering	CO3
6	Where is NoSQL used?	BTL 2	Understanding	CO3
7	When not to use NoSQL?	BTL 2	Understanding	CO3
8	What is meant by NoSQL database?	BTL 1	Remembering	CO3
9	State the CAP Theorem.	BTL 1	Remembering	CO3
10	What is sharding in NoSQL databases?	BTL 1	Remembering	CO3
11	Compare the sharding vs fragmentation.	BTL 2	Understanding	CO3
12	What is a document-based database in NoSQL?	BTL 1	Remembering	CO3
13	What are the four basic operations in MongoDB?	BTL 1	Remembering	CO3
14	How to run command MongoDB?	BTL 2	Understanding	CO3
15	What is Replication in MongoDB?	BTL 1	Remembering	CO3
16	Why is Replication needed?	BTL 2	Understanding	CO3
17	What is Cassandra?	BTL 1	Remembering	CO3
18	Specify the language is used in Cassandra database?	BTL 1	Remembering	CO3
19	List the HIVE Data types.	BTL 1	Remembering	CO3
20	What is HiveQL?	BTL 1	Remembering	CO3
21	Sate an example of a graph database application.	BTL 1	Remembering	CO3
22	Write about the OrientDB Features.	BTL 1	Remembering	CO3
23	Difference between SQL and HiveQL.	BTL 2	Understanding	CO3
24	Distinguish between SQL and Cassandra.	BTL 2	Understanding	CO3
25	An online service divides a huge customer database across several servers. What NoSQL technique is being used?	BTL-2	Understanding	CO 3
PART –B				
1	Explain how NoSQL databases are generally classified into various main categories.	BTL 3	Applying	CO3
2	Explain the following :(10+6) (i) Key Features of NoSQL (ii) Disadvantages of NoSQL	BTL 3	Applying	CO3
3	(i) How does Sharding work? (6) (ii) Explain the features of Sharding.(10)	BTL 6	Creating	CO3
4	Illustrate the working of Document Data Model with example.	BTL 4	Analyzing	CO3
5	(i) Briefly explain how to run a query in MongoDB?(8) (ii) How to create a db in MongoDB?(8).	BTL 3	Applying	CO3
6	How to work the following MongoDB commands?(8+8) (i) Insert	BTL 3	Applying	CO3

	(ii) Update			
7	How to work the following MongoDB commands?(8+8) (i) Delete (ii) Find	BTL 6	Creating	CO3
8	Describe about the MongoDB Query Operators.	BTL 4	Analyzing	CO3
9	(i) How work with search index in MongoDB.(7) (ii) Elaborate the Applications of MongoDB.(9)	BTL 6	Creating	CO3
10	Explain the concept and example for Aggregation operations in MongoDB.	BTL 3	Applying	CO3
11	Describe how Replication Works in MongoDB.	BTL 6	Creating	CO3
12	Analyse how Key Space works in Cassandra with suitable example.	BTL 4	Analyzing	CO3
13	Write a short note about Cassandra Data Model.	BTL 3	Applying	CO3
14	Discuss about the table operations in Cassandra.	BTL 3	Applying	CO3
15	Discuss about CRUD Operations with performance steps.	BTL 4	Analyzing	CO3
16	Explain the concept of CQL Types with examples.	BTL 5	Evaluating	CO3
17	Compare the features of HIVE and Cassandra in detail.	BTL 5	Evaluating	CO3
18	A social media platform has millions of users distributed across different geographical regions. Explain how MongoDB replication and sharding can be used to provide scalability, availability, and high performance.	BTL-6	Creating	CO3

UNIT IV XML DATABASES

Structured, Semi structured, and Unstructured Data – XML Hierarchical Data Model – XML Documents – Document Type Definition – XML Schema – XML Documents and Databases – XML Querying – XPath – XQuery

Q.No.	Question	Bloom's Taxonomy Level	Competence	Course Outcome
PART – A				
1.	Define XML Database.	BTL1	Remembering	CO4
2.	List the types of XML databases.	BTL1	Remembering	CO4
3.	Why XML Namespaces is needed?	BTL2	Understanding	CO4
4.	How to get rid of name conflict?	BTL2	Understanding	CO4
5.	Expand the term URI.	BTL1	Remembering	CO4
6.	Differentiate between CDATA and PCDATA.	BTL1	Remembering	CO4
7.	Mention an example of structured and unstructured data.	BTL1	Remembering	CO4
8.	Write any two examples of semi-structured data.	BTL1	Remembering	CO4
9.	Is HTML structured or unstructured?	BTL2	Understanding	CO4
10.	What is an XML file?	BTL2	Understanding	CO4
11.	Define XML Schema.	BTL1	Remembering	CO4
12.	What is XQuery?	BTL1	Remembering	CO4
13.	What is FLWOR expression?	BTL1	Remembering	CO4
14.	What are XQuery Data Types?	BTL1	Remembering	CO4
15.	How to make a function call in XQuery?	BTL1	Remembering	CO4
16.	What is XPath?	BTL2	Understanding	CO4
17.	What are the main features of XPath?	BTL1	Remembering	CO4
18.	What do you mean by XPath expressions?	BTL1	Remembering	CO4
19.	What do you mean by XPath nodes?	BTL1	Remembering	CO4

20.	How many types of nodes in XPath?	BTL1	Remembering	CO4
21.	What is the meaning of absolute path in XPath?	BTL1	Remembering	CO4
22.	Differentiate between absolute path and relative path.	BTL2	Understanding	CO4
23.	Name any two XPath number functions.	BTL2	Understanding	CO4
24.	How to define relationship among nodes?	BTL1	Remembering	CO4
25.	An XML document contains nested elements representing a company's departments and employees. Which XML data model represents this structure?	BTL-2	Understanding	CO 4

PART –B

1	Compare DTD with XSD.	BTL4	Analyzing	CO4
2	Evaluate Structured, Semi structured, and Unstructured Data.	BTL5	Evaluating	CO4
3	Explain about three types of structured data in detail.	BTL3	Applying	CO4
4	Explain about XMLTree Structure with suitable example.	BTL3	Applying	CO4
5	Write about the following(8+8) (i) Pros and Cons of Unstructured Data (ii) Pros and Cons of Structured Data	BTL3	Applying	CO4
6	Explain xml standard structure and its rules.	BTL3	Applying	CO4
7	Explain XQuery installation with example.	BTL3	Applying	CO4
8	Describe about the uses of XQuery.	BTL3	Applying	CO4
9	Explain the XQuery basic syntax rules with example.	BTL5	Evaluating	CO4
10	Write an example for XQuery Conditional Expressions.	BTL3	Applying	CO4
11	Illustrate the operators used in XQuery Comparisons.	BTL3	Applying	CO4
12	Evaluate the Selecting and Filtering Elements in XQuery.	BTL4	Analyzing	CO4
13	Explain XQuery User-Defined Functions with example.	BTL3	Applying	CO4
14	Evaluate the different types of operators in XPath with example.	BTL5	Evaluating	CO4
15	Illustrate the XPath Axes with suitable example.	BTL3	Applying	CO4
16	Compare and contrast recurrent neural networks (RNNs) and Long Short-Term Memory (LSTM) networks.	BTL4	Analyzing	CO4
17	Explain the concept of v a r i o u s XPath String Function. Provide suitable examples.	BTL3	Applying	CO4
18	Two banks exchange customer and transaction information using XML. Explain how DTD and XML Schema can be used to validate the exchanged XML data. Compare their suitability.	BTL-6	Creating	CO 4

UNIT V INFORMATION RETRIEVAL AND WEB SEARCH

IR concepts – Retrieval Models – Queries in IR system – Text Preprocessing – Inverted Indexing – Evaluation Measures – Web Search and Analytics – Current trends

Q.No.	Question	Bloom's Taxonomy Level	Competence	Course Outcome
PART – A				
1	Expand the term IR.	BTL1	Remembering	CO5
2	What is an IR Model?	BTL1	Remembering	CO5
3	List the types of retrieval model.	BTL1	Remembering	CO5
4	Define text preprocessing.	BTL1	Remembering	CO5
5	What do you mean by Stemming and Lemmatization?	BTL1	Remembering	CO5

6	What is web search engine?	BTL1	Remembering	CO5
7	Name any two example of information retrieval.	BTL1	Remembering	CO5
8	List out the goals of IR.	BTL1	Remembering	CO5
9	State the advantages of Information Retrieval.	BTL1	Remembering	CO5
10	Write any two disadvantages of Information Retrieval?	BTL1	Remembering	CO5
11	Specify the issues in IR.	BTL1	Remembering	CO5
12	What is the primary data structure of most of the IR systems used?	BTL1	Remembering	CO5
13	What are the Search Tools are available?	BTL1	Remembering	CO5
14	Mention the IRS Criteria for evaluation.	BTL1	Remembering	CO5
15	Differentiate between IR and web search.	BTL2	Understanding	CO5
16	What is web analytics?	BTL1	Remembering	CO5
17	What are the approaches to Web Content Analysis?	BTL1	Remembering	CO5
18	How is web search done?	BTL2	Understanding	CO5
19	Define Web Spamming.	BTL1	Remembering	CO5
20	What is a text preprocessing method?	BTL1	Remembering	CO5
21	What is information extraction?	BTL1	Remembering	CO5
22	Mention the examples of preprocessing.	BTL1	Remembering	CO5
23	How many types of data preprocessing are there?	BTL2	Understanding	CO5
24	What is an inverted index in information retrieval?	BTL1	Remembering	CO5
25	A user searches Google for "best restaurants in Chennai." What IR process converts the user's input into a form suitable for searching?	BTL-2	Understanding	CO 5

PART –B

1	Explain the types of queries in IR systems.	BTL4	Analyzing	CO5
2	Discuss the various steps involved in text preprocessing.	BTL4	Analyzing	CO5
3	Evaluate the measures for an IRS with online and offline metrics.	BTL5	Evaluating	CO5
4	Explain the current trends in web search with suitable scenario.	BTL4	Analyzing	CO5
5	Discuss with neat diagram of User Interaction with Information Retrieval System.	BTL4	Analyzing	CO5
6	Compare between Information Retrieval and Data Retrieval.	BTL4	Analyzing	CO5
7	Outline the key steps involved in building Components of Information Retrieval Model.	BTL4	Analyzing	CO5
8	Explain the Design features of Information retrieval (IR) systems.	BTL3	Applying	CO5
9	Evaluate the advantages and Disadvantages of the Boolean Model.	BTL4	Evaluating	CO5
10	Evaluate the models of information retrieval systems based on input and output aspects.	BTL5	Evaluating	CO5
11	Evaluate the models of information retrieval systems based on Theories and Tools aspects.	BTL5	Evaluating	CO5
12	Explain the various basic Search Techniques in detail.	BTL3	Applying	CO5
13	Explain the main approaches to Web Content Analysis.	BTL3	Applying	CO5
14	Outline the steps involved in text Preprocessing.	BTL3	Applying	CO5
15	Compare Inverted Index and Forward Index with suitable example.	BTL4	Analyzing	CO5

16	Outline the primary steps involved in performing evaluation and measurement of Information Retrieval System.	BTL3	Applying	CO5
17	Describe the emerging trends and technologies of Web Analytics.	BTL3	Applying	CO5
18	A company wants to understand what users search for, which pages they visit, and where they leave the website. Explain how web search analytics can be used to analyze user behavior and improve the search engine.	BTL6	Creating	CO5

