CONTROLLER OF EXAMINATION ADDITIONAL AU CHENNAI 600 025

Roll No. | | | | | | | | | | |

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. / B. Tech / (Full Time) - END SEMESTER EXAMINATIONS, APRIL / MAY 2024

INFORMATION TECHNOLOGY

IT5007 Advances in Databases

(Regulation [illegible] / 2019)

Time: 3hrs. Max. Marks: 100

CO 1	To learn the fundamentals of data modeling and design in advanced databases.
CO 2	To learn the significance of NoSQL.
CO 3	To learn databases such as XML and Data warehouse building models.
CO 4	To understand the basics of spatial, temporal, mobile, active, and deductive databases and their applications.
CO 5	To learn about the IR and Web Search models.

BL – Bloom's Taxonomy Levels

(L1 - Remembering, L2 - Understanding, L3 - Applying, L4 - Analysing, L5 - Evaluating, L6 - Creating)

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

Q. No	Questions	Marks	CO	BL
1	Justify the need for Distributed Databases in Enterprise Application Development.	2	1	2
2	State whether ACID properties are strictly applicable in Distributed Database Systems or not. Justify your statement.	2	1	2
3	Compare NoSQL Databases with SQL Databases.	2	2	2
4	Highlight the features of CAP theorem in Databases systems.	2	2	2
5	Differentiate Location dependent and Location independent Query in Mobile Database systems.	2	3	2
6	What kind of queries can be applied in Multimedia Database systems? Explain.	2	3	2
7	Compare the features of XML with HTML.	2	4	2
8	What is the difference between 'Datamart' and 'Data Warehouse'?	2	4	2
9	What are the sources through which Information can be retrieved in Information Retrieval systems?	2	5	2
10	List out the current trends in web search approaches.	2	5	2

PART- B (5 x 13 = 65 Marks)

(Restrict to a maximum of 2 subdivisions)

Q. No	Questions	Marks	CO	BL
11 (a) (i)	List the different types of fragmentations supported by a Distributed Database system with suitable examples in a banking domain.	7	1	3

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(ii)	Assume that multiple clients are initiating various transactions in a distributed database environment simultaneously. Explain the protocol used while handling these transactions concurrently in a distributed database system.	6	1	3
	OR			
11 (b) (i)	List the different types of transparencies that are to be supported in a Distributed Database system. Justify these transparencies in the banking domain.	7	1	3
(ii)	Consider a scenario where one million records of Bank customers are stored in a Distributed Database system across multiple locations. It is necessary to list the customers who have availed housing loan and also educational loan in the past 10 years. Suggest the means of executing these queries in a Distributed Database system.	6	1	3
12 (a) (i)	Compare sharding with partitioning.	5	2	2
(ii)	List out the operations that can be performed on a MongoDB NoSQL database system. Explain the syntax for CRUD.	8	2	3
	OR			
12 (b) (i)	Highlight the features of Hive NoSQL Databases.	5	2	2
(ii)	Consider a Cassandra Distributed Database with 5 nodes. Using CQL, create a database and insert with replication factor as 3.	8	2	3
13 (a) (i)	What are the advantages of Spatial Database? Explain.	6	3	2
(ii)	Highlight the features of Active Database System.	7	3	2
	OR			
13 (b) (i)	Write any three temporal queries in a movie database.	6	3	2
(ii)	Highlight the features of Deductive Database system.	7	3	2
14 (a) (i)	Compare DOM parser with SAX parser in XML Databases.	5	4	2
(ii)	Consider a Book publishing company, which is located in different regions of the country. It has multiple authors and distributors. Design a Star schema based Data Warehouse to realize this application.	8	4	3
	OR			
14 (b) (i)	Describe the structure of XQuery and explain the query execution process in XML.	5	4	2
(ii)	Consider a chain of restaurants which are functioning in multiple cities with different vendors and types of food items. Using a snowflake schema, design a multi dimensional data model.	8	4	3
15 (a) (i)	List the various steps involved in text preprocessing.	7	5	2
(ii)	Explain the retrieval model used in IR.	6	5	2
	OR			
15 (b) (i)	List the evaluation metrics used for Information Retrieval.	7	5	2
(ii)	Explain the various features associated with web search engine.	6	5	2

PART- C (1 x 15 = 15 Marks)

(Q.No.16 is compulsory)

Q. No	Questions	Marks	CO	BL
16. (i)	Explain the process of using MongoDB with PHP? Clearly explain the connection establishment and CRUD operations using PHP.	9	2	3
(ii)	Create a MongoDB database for a customer DB with five records. The customer may have no / single / multiple mobile numbers, zero / one email ID, optional address for communication, optional DoB and interest.	6	2	3