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**PRESIDENCY UNIVERSITY**

**Bengaluru**

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| **End - Term Examinations – JANUARY 2025** |
| **Date:** 17-01-2025 **Time:** 09:30 am to 12:30 pm |

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| **School:** SOCSE | **Program:** B. Tech –CSE/CBD | |
| **Course Code :**CSE2024 | **Course Name :** No SQL database | |
| **Semester**: V | **Max Marks**: 100 | **Weightage**: 50% |

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| **CO - Levels** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** |
| **Marks** | **26** | **26** | **24** | **24** |  |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Do not write anything on the question paper other than roll number.*

**Part A**

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| **Answer ALL the Questions. Each question carries 2marks. 10Q x 2M=20M** | | | | |
| **1** | **Explain** why MongoDB is considered a schema-less database. | **2 Marks** | **L1** | **CO1** |
| **2** | **Mention** two advantages of Cassandra’s distributed architecture | **2 Marks** | **L1** | **CO1** |
| **3** | **Demonstrate** what is meant by a key-value store in NoSQL databases. | **2 Marks** | **L2** | **CO1** |
| **4** | Describe the default database in MongoDB after installation? | **2 Marks** | **L2** | **CO1** |
| **5** | **Explain the primary use case of MongoDB’s aggregation framework** | **2 Marks** | **L2** | **CO3** |
| **6** | Explain why NoSQL databases are considered scalable | **2 Marks** | **L2** | **CO2** |
| **7** | Differentiate between embedded documents and referenced documents in MongoDB | **2 Marks** | **L2** | **CO2** |
| **8** | **Describe real-world applications that use graph-based NoSQL databases, providing examples** | **2 Marks** | **L2** | **CO2** |
| **9** | **State** two advantages of using NoSQL databases over relational databases. | **2 Marks** | **L2** | **CO2** |
| **10** | **Discuss** the importance of horizontal scaling in NoSQL systems. | **2 Marks** | **L2** | **CO2** |

**Part B**

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| **Answer the Questions Total 80 Marks.** | | | | | |
| **11.** | **a.**  **b.**  **c.** | Explain the differences between SQL and NoSQL databases.  Illustrate the concept of read consistency with an example.  Apply your understanding of the PageRank algorithm to define the damping factor, state its typical value, and explain its significance in real-world scenarios. | **4 Marks**  **6 Marks**  **10 Marks** | **L2**  **L2**  **L3** | **CO1**  **CO2**  **CO4** |
| **or** | | | | | |
| **12.** | **a.**  **b.**  **c.** | Demonstrate how relationships are represented in a graph-based data model with an example.  Illustrate the Document Storage model with an example.  Demonstrate the ACID properties of RDBMS with an example | **4 Marks**  **6 Marks**  **10 Marks** | **L2**  **L2**  **L2** | **CO1**  **CO2**  **CO4** |
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| **13.** | **a.**  **b.**  **c.** | Explain the concept of Indexing in NoSQL Database.  Demonstrate the Key-Value Storage model by creating an example that shows how it can be used in a real-world scenario.  Compare the indexing mechanism in MongoDB with that of relational databases. How does it improve query performance? | **6 Marks**  **6 Marks**  **8 Marks** | **L2**  **L3**  **L3** | **CO1**  **CO2**  **CO3** |
| **or** | | | | | |
| **14.** | **a.**  **b.**  **c.** | Explain capped collections with an example  How does the PageRank algorithm handle dangling nodes (pages with no outbound links), and why is this necessary?  Explain update consistency with an example. | **6 Marks**  **6 Marks**  **8 Marks** | **L2**  **L3**  **L2** | **CO1**  **CO2**  **CO3** |

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| **15.** | **a.**  **b.**  **c.** | Explain Brewers theorem.  Describe the advantages of columnar data model.  Construct the Graph database model with an example. | **4 Marks**  **6 Marks**  **10 Marks** | **L2**  **L2**  **L3** | **CO1**  **CO2**  **CO4** |
| **Or** | | | | | |
| **16.** | **a.**  **b.**  **c.** | Describe the concept of adaptive indexing.  How does the PageRank algorithm handle dangling nodes (pages with no outbound links), and why is this necessary?  Analyze the differences between row-oriented databases and column-oriented databases. | **4 Marks**  **6 Marks**  **10 Marks** | **L2**  **L2**  **L4** | **CO1**  **CO2**  **CO4** |

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| **17.** | Write the following operation in MongoDB.  i. Create a new MongoDB database named "EmployeeDB" and within it, create a collection named "Employees."  ii. Insert 5 new employee records into the "Employees" collection with details like employee name, employee ID, department, salary, and hire date.  iii. Find and display all employees in the "Employees" collection who belong to a specific department (e.g., "Sales").  iv. Retrieve and display employee details for employees with salaries in a specific range (e.g., $50,000 - $60,000).  v. Update the salary for an employee with a specific employee ID to $65,000.  vi. Delete all employees in the "Employees" collection hired before a specific date.  vii. Remove the entire "Employees" collection from the "EmployeeDB" database.  viii. Delete the entire "EmployeeDB" database from your MongoDB server.  ix. Group employees by department and calculate the average salary for each department.  x. Find the department with the highest average salary. | **20 Marks** | **L3** | **CO3** |
| **Or** | | | | |
| **18.** | Demonstrate the following Cassandra Operations for the below queries.  a. Insert 5 records into Student table with 5 columns namely SID,Sname,Sage,Sdept,Sphone.  b. Read the table.  c. Update the dept of any one student.  d.Delete the 5th record from the table.  e. Perform batch operation for inserting one new record,updating and deleting any one record.  f. Alter student student by adding one more column to the existing table whose name is Semail.  g. Truncate the student table | **20 Marks** | **L3** | **CO3** |

**\*\*\*\*\* BEST WISHES \*\*\*\*\***