

INDIRA UNIVERSITY, PUNE

SCHOOL OF INFORMATION TECHNOLOGY-MSC (CS)

Term End Examination (2025 Pattern) December – 2025 - Semester – I

Subject Name: Database Technologies
Subject Code: 25PSC101T

Max. Marks: 50
Time: 2:30 Hrs.

Instructions

- All Questions are Compulsory.
- Figures to the right indicate full marks

CO #	Cognitive Ability	Course Outcome
CO1	Remember	Explain the core concepts of NoSQL, including data models, distribution strategies, consistency, and version control
CO2	Understand	Compare various NoSQL database types such as Key-Value, Document, Column-Family, and Graph databases based on structure and use cases
CO3	Apply	Apply MapReduce programming for processing and querying large datasets in NoSQL environments

Q1.	Attempt any 5 out of 7. (2 mark each) a) What is impedance mismatch? b) List two examples of a column-family database. c) Define non-uniform data d) Define master-slave replication in NoSQL schema e) Define Sticky Session f) What is a vector stamp? g) Define Map-Reduce.	(10 Marks)	CO1
Q2.	Attempt any 4 out of 6. (5 marks each) a) Compare key-value databases with relational databases in terms of data modeling. b) Explain how transactions are handled in document databases. c) Explain Cassandra's data model with diagram and explain the same. d) Explain the suitable use cases of column-store databases e) Outline the advantages of using graph databases for connected data. f) Summarize a note on Incremental Migration.	(20 Marks)	CO2

Q.3.	<p>Attempt any 2 out of 3. (5 marks each) (10 Marks)</p> <p>a) Identify and discuss how using multiple data stores can improve application functionality.</p> <p>b) Identify and explain how event sourcing differs from traditional data storage methods.</p> <p>c) Choose between using a relational database and a document-oriented database for an e-commerce company that needs to manage diverse product information, customer reviews, and dynamic pricing. Discuss which option would be more suitable and justify your choice with appropriate reasons.</p>	CO3
Q.3	<p>Attempt any ONE. (10 marks)</p> <p>A) Develop a suitable document structure for an e-commerce company to efficiently store and manage information about products, customers, and orders using a document-oriented database. Illustrate how the data would be organized and explain how this structure supports scalability and fast data retrieval.</p> <p style="text-align: center;">OR</p> <p>B) Construct a graph-based model showing relationships among users and products.</p>	CO3
