

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc(SS) DEGREE EXAMINATION DECEMBER 2024
(Ninth Semester)

Branch – **SOFTWARE SYSTEMS** (Five years Integrated)

MODERN DATABASE SYSTEMS

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks

(10 x 1 = 10)

- 1 Which of the following techniques is used in parallel query optimization?
(i) Data partitioning (ii) Transaction locking
(iii) Data replication (iv) Query caching
- 2 Which component is crucial for optimizing distributed queries?
(i) Indexing (ii) Query decomposition
(iii) Data compression (iv) Data replication
- 3 In data modeling for big data, a key focus is on:
(i) Relational integrity (ii) Fixed schema flexibility
(iii) Handling unstructured data (iv) Normalization of tables
- 4 What is the primary advantage of NoSQL databases for big data?
(i) Strong consistency (ii) Scalability
(iii) Limited schema flexibility (iv) High disk space usage
- 5 In Redis, data is primarily stored in:
(i) Disk-based tables (ii) Column families
(iii) In-memory data structures (iv) Distributed file systems
- 6 Which NoSQL model is most suited for time-series data?
(i) Key-value store (ii) Graph store
(iii) Column-oriented store (iv) Document store
- 7 In a graph database like Neo4j, relationships are represented as:
(i) Edges (ii) Documents
(iii) Columns (iv) Keys
- 8 Which of the following use cases is best suited for a graph database?
(i) Storing large documents (ii) Social network analysis
(iii) Financial transactions (iv) Simple key-value data storage
- 9 Which component in HDFS is responsible for managing metadata?
(i) DataNode (ii) Task Tracker
(iii) NameNode (iv) Job Tracker
- 10 Microsoft Azure is a platform primarily used for:
(i) Local database management (ii) Cloud computing and storage
(iii) Real-time analytics (iv) Graph database operations

Cont...

SECTION - B (25 Marks)

Answer ALL questions
ALL questions carry EQUAL Marks

(5 x 5 = 25)

- 11 a Explain the Architecture of parallel databases.
OR
b Prepare and state the ANSI/SPARC Architecture.
- 12 a Determine the NoSQL data Models with example.
OR
b Classify the various types of NOSQL database.
- 13 a Evaluate the in-memory Key-value store in NoSQL.
OR
b Illustrate the Hbase Architecture.
- 14 a Justify in detail about the XML databases.
OR
b Explain about the MongoDB in detail.
- 15 a Sketch about the Data Warehouse Integration.
OR
b Evaluate in detail about the Big data Application.

SECTION -C (40 Marks)

Answer ALL questions
ALL questions carry EQUAL Marks
Question No. 16 is Compulsory

(5 x 8 = 40)

- 16 Elucidate the Distributed Query Processing and Optimization.
- 17 a Justify the Data Model? Explain the various types of data models.
OR
b Develop the Basic Principles of NoSQL models.
- 18 a Explain in detail about Apache Cassandra.
OR
b Enumerate about the Amazon DynamoDB NoSQL database service.
- 19 a Explain` the Structure and features of Neo4j.
OR
b Criticize about the Concepts of Orient DB with example.
- 20 a Design the Microsoft Azure in detail.
OR
b Elucidate about the Apache Hadoop Architecture.

Z-Z-Z

END