

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MCA DEGREE EXAMINATION DECEMBER 2025
(First Semester)

Branch - COMPUTER APPLICATION

HYBRID DATABASE MANAGEMENT SYSTEM

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks ($10 \times 1 = 10$)

Module No.	Question No.	Question	K Level	CO
1	1	Which of the following is not a feature of DBMS? a) Redundancy of Data b) High Level of Security c) Single-user Access only d) Support ACID Property	K1	CO1
	2	Which of the following types of users have limited knowledge of the database structure? a) Casual Users b) Database Administrators c) Naive Users d) Application Programmers	K2	CO1
2	3	When a relation contains an atomic value, it is called as _____ relation a) 1NF b) 2NF c) 3NF d) 4NF	K1	CO2
	4	What is not TRUE about BCNF? a) The advanced version of 3NF is BCNF. b) BCNF is stricter than 3NF. c) Data duplication is reduced. d) None	K2	CO2
3	5	What is TRUE about UNION ALL Operator? a) The results of both queries are combined with this operator. b) After performing the UNION ALL operation, duplicate rows will not be removed. c) Both A and B d) None of the above	K1	CO1
	6	Which of the following Big Data use cases is still better handled by RDBMSs compared to NoSQL systems? a) Real-time streaming analytics b) Complex join operations and relational data modeling c) Storing logs and time-series data d) Handling highly dynamic schema	K2	CO1
4	7	What is the primary role of the MongoDB core server? a) To provide a graphical user interface for managing databases b) To store, manage, and retrieve document-based data c) To perform automatic backups of data d) To monitor server health and performance only	K1	CO1
	8	Which of the following commands updates the age to 25 for a user named "Alice" in the users collection? a) db.users.update({name: "Alice"}, {\$set: {age: 25}}) b) db.users.modify({name: "Alice"}, {age: 25}) c) db.users.change({name: "Alice"}, {age: 25}) d) db.users.updateOne({age: 25}, {name: "Alice"})	K2	CO2

Cont...

5	9	Which MongoDB feature helps ensure high availability and fault tolerance for an e-commerce platform? a) Single-node deployment b) Replica sets c) Manual backups only d) Local file system storage	K1	CO1
	10	How does MongoDB scale horizontally for load balancing purposes? a) Replication b) Sharding c) Partitioning d) None of the mentioned	K2	CO1

SECTION - B (35 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	What is the role of cardinality in an ER diagram? Explain the different types of cardinality (1:1, 1:N, and N:M) with examples. (OR)	K1	CO1
	11.b.	Describe the roles and responsibilities of database users and administrators.		
2	12.a.	Provide the SQL queries that demonstrate the usage of the UNION, INTERSECT, and MINUS set operations. (OR)	K3	CO2
	12.b.	Demonstrate the concept of advanced aggregation features.		
3	13.a.	Illustrate the role of a CMS in big data management with an example. (OR)	K3	CO3
	13.b.	Differentiate between Document Databases and Columnar Databases.		
4	14.a.	Characterize the MongoDB shell with sample code. (OR)	K4	CO4
	14.b.	Distinguish four features of MongoDB from other databases.		
5	15.a.	Explain how to design an e-commerce system with document-oriented data. (OR)	K5	CO5
	15.b.	Validate the aggregation function in MongoDB with sample code.		

SECTION - C (30 Marks)

Answer ANY THREE questions

ALL questions carry EQUAL Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	List and explain the use of the following SQL clauses: WHERE, ORDER BY, GROUP BY, and HAVING with sample code.	K1	CO1
2	17	Consider a Customers table in Oracle that includes columns <i>CustomerID</i> , <i>Name</i> , <i>JoinDate</i> , and <i>LastPurchaseDate</i> . Write a query using Oracle date functions to find the customers who have not made a purchase in the last 6 months.	K2	CO2
3	18	Explore the following of Key-Value Pair Databases in NoSQL: a. Characteristics b. Advantages c. Limitations	K3	CO3
4	19	Write a MongoDB query in the JavaScript shell that performs the bulk update in <i>Product Order</i> Database. How would you ensure that this operation is atomic and consistent across the documents?	K4	CO4
5	20	Explain an Inventory Management Application in MongoDB with 3 fields.	K5	CO5