



**K. K. Wagh Institute of Engineering Education & Research, Nashik**  
(An Autonomous Institute From A.Y. 2022-23)

WINTER-2025	
Exam Seat No.:	
Academic Year:2025-2026	Semester:IV
Class:SY	Program:B.Tech
Branch Code:INT	Pattern:2023
Name of Course:Database Management System	Course Code:2308212
Max. Marks:60	Duration:2.30 Hrs.

**Instructions:** Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains \_\_\_\_ page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

**Marks CO**

**Question No. 1**

- 1a) List ER diagram symbols & draw an ER diagram for a exam management system with a set of question papers and a set of faculty and department .Associate with each question paper a log of the various department and examinations conducted. (6) CO1

**Question No. 2**

- 2a) For table (OrderID, CustomerID, CustomerName, ProductID, ProductName, Qty, Price, City), identify dependencies and normalize to BCNF. Explain one performance impact of denormalization. (6) CO2

**Question No. 3**

- 3a) What are aggregate functions in SQL? Explain with examples (5) CO3

**OR**

- 3b) Explain different SQL data types and literals with suitable examples. (5) CO3

- 3c) What is query optimization? Explain estimation and transformation of relational expressions in the context of query optimization. (5) CO3

**OR**

- 3d) Define cursors in SQL. How are they created and used in database applications. (5) CO3

- 3e) Write SQL queries to: (6) CO3

1. Display names of employees earning > 60 000.

List department-wise maximum salary

**OR**

- 3f) Given query SELECT E.name, D.dept\_name (6) CO3

FROM Employee E, Department D WHERE E.dept\_id = D.dept\_id AND E. salary >60000 AND D.location ='Pune'; Explain optimization using predicate pushdown and join reordering with an

optimized query tree

**Question No. 4**

4a) What are triggers in SQL? Describe their types and give an example of a BEFORE INSERT trigger. (5) CO3

**OR**

4b) What are views in SQL? How are they created and what are their advantages. (5) CO4

4c) What is serializability ? Explain conflict and view serializability with examples. (5) CO4

**OR**

4d) Describe deadlock detection and prevention techniques used in DBMS. (5) CO4

4e) Two transactions T1(read A, A + 100, write A) and T2(read A, A×2, write A) execute concurrently. Show schedule, test for conflict serializability and suggest locking schedule. (6) CO4

**OR**

4f) Two transactions operate on the same item X: (6) CO4

· T3: read(X), X = X – 50, write(X)

· T4: read(X), X = X + 20, write(X)\*\*

If they execute concurrently:

1. Write an interleaved schedule

2. Check conflict serializability

**Question No. 5**

5a) What is Big Data Analytics? How does it differ from traditional data analysis? Explain its importance with an example (5) CO5

**OR**

5b) Explain Internet Databases and Cloud Databases. How do they support modern applications. (5) CO5

5c) What is Machine Learning? How is it used in Big Data analytics and Business Intelligence? Provide example. (5) CO5

**OR**

5d) What is Data Mining? Explain the process of Data Mining with a suitable diagram or example. (5) CO5

5e) Explain the concept of NoSQL Databases. How are they different from traditional relational databases. (6) CO5

**OR**

5f) What is Big Data Analytics? How does it differ from traditional data analysis? Explain its importance with an example. (6) CO5

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