	Normal Form, 3NF, Normalization using multivalued dependencies, 4NF,5NF.				
M6	Indexing and Hashing: Ordered indices (Primary Index, Dense and Sparse Indices), Secondary Index, B tree and B+ tree indexing, Hashing Concepts and its implementation Basic query optimization techniques, Cost estimation in query optimization	10	7	3	14
M7	Transaction Management: Transaction definition, properties, transaction state diagram, commit and rollback, Serializability (Conflict and View), Concurrency control, lock based protocols, Two phase locking, Timestamp ordering protocol, Recovery management, Deadlock handling and prevention	10	8	2	12
	INTERNAL EXAMINATION	3			30
	TOTAL	48	34	11	100

Practical:

SUBJECT NAME: DBMS Lab **Credit: 2**
SUBJECT CODE: BCAC491

Use any database for the SQL implementation

List of sample Questions for Practical:

1. Write a SQL query to retrieve all columns from a table named "Employees."
2. How do you select distinct values from a column in SQL?
3. Write a SQL query to retrieve all records from the "Orders" table where the order amount is greater than 1000.
4. Explain the difference between INNER JOIN and LEFT JOIN in SQL with an example.
5. How do you use the WHERE clause to filter rows in SQL?
6. Write a SQL query to calculate the total number of orders for each customer from the "Orders" table.
7. What is the purpose of the GROUP BY clause in SQL? Provide an example query.
8. How do you use the HAVING clause in SQL? Provide an example.
9. Write a SQL query to update the salary of an employee with ID 101 to 50000.
10. How do you delete records from a table in SQL? Provide an example.
11. Explain the concept of foreign keys in SQL with an example.
12. Write a SQL query to retrieve the top 5 highest-paid employees from the "Employees" table.
13. How do you use the ORDER BY clause in SQL? Provide an example query.
14. Explain the difference between the UNION and UNION ALL operators in SQL.

15. Write a SQL query to find the average salary of all employees.
16. How do you use the LIKE operator in SQL? Provide an example.
17. Write a SQL query to retrieve the names of all employees whose names start with the letter 'A.'
18. Explain the concept of indexes in SQL databases.
19. Write a SQL query to find the maximum and minimum salary from the "Employees" table.
20. How do you use the BETWEEN operator in SQL? Provide an example.

Based on the curriculum as covered by the subject teacher

SUGGESTED READING:

1. "Database Management Systems" by Raghu Ramakrishnan, Johannes Gehrke - Publisher: McGraw-Hill Education
2. "Database System Concepts" by Abraham Silberschatz, Henry F. Korth, S. Sudarshan - Publisher: McGraw-Hill Education
3. "Fundamentals of Database Systems" by Ramez Elmasri, Shamkant B. Navathe - Publisher: Pearson
4. "Database Management Systems: Designing and Building Business Applications" by Gerald V. Post - Publisher: Wiley
5. "Database Systems: The Complete Book" by Hector Garcia-Molina, Jeffrey D. Ullman, Jennifer Widom - Publisher: Pearson
6. "Principles of Database Management" by Wilfred Hansen - Publisher: Cengage Learning
7. "Database Management Systems" by Ivan Bayross - Publisher: BPB Publications

SUBJECT NAME: Operating System **Credit: 4 L (3L +1 T)**
SUBJECT CODE: BCAC402

COURSE OBJECTIVE:

The course on Operating Systems is designed to provide students with a comprehensive understanding of the fundamental principles and functionalities underlying modern computer operating systems. Throughout the course, students will explore key concepts such as process management, memory management, file systems, and I/O management. They will learn about the role of the operating system in resource allocation, scheduling, and synchronization, gaining insights into how these mechanisms contribute to efficient and reliable system operation.