



# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

## Information Technology

### TUTORIAL QUESTION BANK

Course Name	:	DATABASE MANAGEMENT SYSTEMS
Course Code	:	ACS005
Class	:	B. Tech III Semester
Branch	:	Information Technology
Academic Year	:	2018 – 2019
Course Faculty	:	Ms.K.Laxmi Narayanamma, Assistant Professor, Mr.N.Bhaswanth, Assistant Professor

#### COURSE OBJECTIVES:

The course should enable the students to:

I	Discuss the basic database concepts, applications, data models, schemas and instances.
II	Design Entity Relationship model for a database.
III	Demonstrate the use of constraints and relational algebra operations.
IV	Describe the basics of SQL and construct queries using SQL.
V	Understand the importance of normalization in databases.

#### COURSE LEARNING OUTCOMES:

At the end of the course the students are able to:

S. No	Description
ACS005.01	Differentiate database systems from file systems by enumerating the features provided by database systems and describe each in both function and benefit.
ACS005.02	Define the terminology, features, classifications, and characteristics embodied in database systems.
ACS005.03	Analyze an information storage problem and derive an information model expressed in the form of an entity relation diagram and other optional analysis forms, such as a data dictionary.
ACS005.04	Demonstrate an understanding of the relational data model.
ACS005.05	Transform an information model into a relational database schema and to use a data definition language and/or utilities to implement the schema using a DBMS.
ACS005.06	Formulate, using relational algebra, solutions to a broad range of query problems.
ACS005.07	Understand the SQL data definition and SQL query languages and formulate solutions to a broad range of query and data update problems.
ACS005.08	Understand normalization theory and criticize a database design and improve the design by normalization.
ACS005.09	Declare and enforce integrity constraints on a database using a state-of-the-art RDBMS
ACS005.10	Use an SQL interface of a multi-user relational DBMS package to create, secure, populate, maintain, and query a database.
ACS005.11	Programming PL/SQL including stored procedures, stored functions, cursors, packages.
ACS005.12	Analyze techniques for transaction processing, concurrency control, backup and recovery that maintain data integrity in database systems.

ACS005.13	Implement transactions, concurrency control, and be able to do Database recovery and Query optimization.
ACS005.14	Use a desktop database package to create, populate, maintain, and query a database.
ACS005.15	Familiar with basic database storage structures and access techniques: file and page organizations, indexing methods including B+ tree, and hashing.
ACS005.16	Possess the knowledge and skills for employability and to succeed in national and international level competitive examinations.

## TUTORIAL QUESTION BANK

UNIT – I			
PART – A (Short Answer Questions)			
Q.No	Questions	Blooms Taxonomy Level	Course Learning Outcomes (CLOs)
1	List the advantages of DBMS?	Remember	CACS005.01
2	List the database Applications?	Remember	CACS005.01
3	Define instances and schemas of database?	Remember	CACS005.01
4	Discuss Data Independence?	Understand	CACS005.01
5	Explain database Access for applications Programs	Understand	CACS005.01
6	Define (i) Database (ii) DBMS	Remember	CACS005.02
7	Explain about Database storage structure?	Understand	CACS005.02
8	Discuss Transaction management?	Understand	CACS005.02
9	Explain the Query Processor?	Understand	CACS005.02
10	Define (i) Entity (ii) Attribute	Remember	CACS005.02
11	Define Relationship and Relationship set?	Remember	CACS005.03
12	Discuss about Data Definition language?	Understand	CACS005.03
13	Discuss about Data Manipulation language?	Understand	CACS005.03
14	Explain about querying relational data?	Understand	CACS005.04
15	Explain the History of Data base Systems?	Understand	CACS005.04
16	Discuss how can you change the data in the table?	Understand	CACS005.04
17	List various types of attributes?	Remember	CACS005.04
18	Discuss How can you alter and destroy tables?	Understand	CACS005.04
PART – B (Long Answer Questions)			
1	Compare and Contrast file Systems with database systems?	Understand	CACS005.01
2	Define Data Abstraction and discuss levels of Abstraction?	Remember	CACS005.01
3	Discuss about different types of Data models?	Understand	CACS005.01
4	Describe the Structure of DBMS?	Understand	CACS005.01
5	Construct an E-R diagram for a car-insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents.	Understand	CACS005.04
6	What guidelines would you use for each of these choices when doing ER design: whether to use an attribute or an entity set, an entity or a relationship set, a binary or ternary relationship, or aggregation.	Remember	CACS005.04
7	Explain views and updates on views?	Understand	CACS005.05
8	Explain different types of database users and write the functions of DBA?	Understand	CACS005.01
9	Explain about different types of integrity constraints?	Understand	CACS005.07
10	Define the following kinds of constraints, and give an example of each: Key constraint, participation constraint. What is a weak entity? What are class hierarchies? What is aggregation?	Remember	CACS005.07
11	Distinguish strong entity set with weak entity set? Draw an ER diagram to illustrate weak entity set?	Understand	CACS005.04
12	Differentiate relation schema and relational instance? Define the terms arity and degree of a relation? What are domain constraints?	Understand	CACS005.04

<b>PART – C (Problem Solving and Critical Thinking Questions)</b>			
1	What is logical data independence and why is it important?	Remember	CACS005.04
2	Which of the following plays an important role in representing information about the real world in a database? Explain briefly. 1. The data definition language. 2. The data manipulation language. 3. The buffer manager. 4. The data model.	Remember	CACS005.04
3	Explain Why would you choose a database system instead of simply storing data in operating system files? When would it make sense not to use a database system?	Understand	CACS005.07
4	We can convert any weak entity set to strong entity set by simply adding appropriate attributes. Explain why, then, do we have weak entity sets?	Understand	CACS005.04
5	Explain What are the responsibilities of a DBA? If we assume that the DBA is never interested in running his or her own queries, does the DBA still need to understand query optimization? Why?	Understand	CACS005.04
6	Describe the structure of a DBMS. If your operating system is upgraded to support some new functions on OS files (e.g., the ability to force some sequence of bytes to disk), which layer(s) of the DBMS would you have to rewrite to take advantage of these new functions?	Remember	CACS005.04
7	Explain the difference between external, internal, and conceptual schemas. How are these different schema layers related to the concepts of logical and physical data independence?	Understand	CACS005.04
8	Define the following terms: relation schema, relational database schema, domain, attribute, attribute domain, relation instance, relation cardinality, and relation degree	Remember	CACS005.04
9	Discuss the disadvantages of file processing system, and explain how these disadvantages are avoided in DBMS	Remember	CACS005.04
10	A company database needs to store information about employees (identified by ssn, with salary and phone as attributes), departments (identified by dna, with dname and budget as attributes), and children of employees (with name and age as attributes). Employees work in departments; each department is managed by an employee; a child must be identified uniquely by name when the parent (who is an employee; assume that only one parent works for the company) is known. We are not interested in information about a child once the parent leaves the company. Represent an ER diagram that captures this information.	Understand	CACS005.04
<b>UNIT – II</b>			
<b>PART – A (Short Answer Questions)</b>			
1	Define relational Algebra query?	Remember	CACS005.07
2	State about SELECT operation in Relational algebra?	Remember	CACS005.07
3	State about PROJECT operation in Relational algebra?	Remember	CACS005.07
4	List set operations in relational algebra?	Remember	CACS005.07
5	Discuss the use of rename operation?	Remember	CACS005.07
6	Illustrate division operation?	Understand	CACS005.07
7	Define Cross Product operation?	Remember	CACS005.07
8	Define Join Operation.	Remember	CACS005.07
9	Illustrate tuple variable with its syntax?	Understand	CACS005.07
10	Define a DRC Query ?	Remember	CACS005.07
11	Discuss the difference between EJoin and Natural Join?	Remember	CACS005.07
12	Define a TRC query ?	Remember	CACS005.07
13	Name the types joins?	Remember	CACS005.07
<b>PART – B (Long Answer Questions)</b>			
1	Illustrate different set operations in Relational algebra with an example?	Understand	CACS005.06
2	Define Join? Explain different types of joins?	Remember	CACS005.06
3	Discuss about Domain Relational calculus in detail?	Understand	CACS005.06
4	Discuss the difference between Relational Algebra and Relational Calculus?	Understand	CACS005.07
5	Discuss different types of aggregate operators with examples in Relational Algebra?	Understand	CACS005.07

6	a. Define a query in Tuple relational Calculus? b. Write a query in TRC to find the names of sailors who have reserved both red and green boat? c. Write a query in TRC to find the names of sailors who have reserved all boats?	Remember	CACS005.07
7	a. Define a query in Domain Relational Calculus? b. Write a query in DRC to find the names of sailors who have reserved a red boat? c. Write a query in DRC, to find the names of sailors who have not reserved a red boat?	Remember	CACS005.07
8	What is relational completeness? If a query language is relationally complete, can you write any desired query in that language?	Remember	CACS005.07
9	Discuss about the operators SELECT, PROJECT, UNION with examples?	Remember	CACS005.07
10	a. Explain Relational calculus? b. Define a TRC query to find the names of sailors who have reserved boat 103? c. Define a DRC query to find the names of sailors who have reserved boat 103?	Remember	CACS005.06
<b>PART – C (Problem Solving and Critical Thinking Questions)</b>			
1	Consider the following relational schema Employee (empno, name, office, age) Books (isbn, title, authors, publisher) Loan (empno, isbn, date) Discuss the following queries in relational algebra. a. Find the names of employees who have borrowed a book Published by McGraw-Hill? b. Find the names of employees who have borrowed all books Published by McGraw-Hill? c. Find the names of employees who have borrowed more than five different books published by McGraw-Hill?	Remember	CACS005.06
2	Consider the employee database. Give an expression in the relational algebra to express each of the following queries: a. Find the names of all employees who live in city “Miami”. b. Find the names of all employees whose salary is greater than \$100,000. c. Find the names of all employees who live in “Miami” and whose salary is greater than \$100,000.	Understand	CACS005.07
3	Given the relations: <i>employee(name, salary, deptno)</i> <i>department (deptno, deptname, address)</i> Explain which query cannot be expressed using the basic relational algebra operations.	Understand	CACS005.06
4	Express a relational algebra expressions to find second highest salary of Employee from Employee table?	Understand	CACS005.07
5	Consider the following schema given. The primary keys are underlined. Sailors( <u>sailor-id</u> , sailor-name, sailor-rating, sailor-age) Boats( <u>boat-id</u> , boat-name, boat-color) Reserves( <u>sailor-id</u> , <u>boat-id</u> , day) Express the relational algebra queries to i. Find the names of sailors who have reserved boat number 120 ii. Find the names of sailors who have reserved a green boat iii. Find the names of sailors who have not reserved a green boat iv. Find the names of sailors with the highest rating	Understand	CACS005.07
6	Consider the following database. Employee (employee-name, street, city) Works (employee-name, company-name, salary) Company (company-name, city) Manager (employee-name, manager-name) Find an expression in the relational algebra, the tuple relational calculus, and the domain relational calculus, for the following query. Find the names of all employees who work for estate bank.	Remember	CACS005.07

7	Express the TRC expression for the following Queries? Sailor Schema (sailor id, Sailormame, Rating.Age) Reserves (Sailor id, Boat id, Day) Boat Schema (Boat id, Boatname.color) i. Find the names of sailors who have reserved boat 103; ii. Find the sailor id of sailors who have reserved a green boat; iii. Find the colors of boats reserved by the sailor Lubber? iv. Find the names of sailors who have reserved both red and green boat?	Understand	CACS005.07
8	Explain different set operations in Relational algebra with an example?	Understand	CACS005.07
9	Express TRC expressions for the following relational database? sailor schema (sailor id, Boat id, sailormame, rating, age) Recerves (Sailor id, Boat id, Day) Boat Schema (boat id, Boatname, color) i. Find all sailors with a rating above 7. ii Find the narnes of sailors who have reserved a red boat. iii. Find the No.of reservations for each red boat? iv. Find the names of sailors who have reserved at least two boats.	Understand	CACS005.07
10	Consider the following expressions, which use the result of a relational algebra operation as the input to another operation. For each expression, explain in words what the expression does. a) $\text{syar} \geq 2009(\text{takes}) \bowtie (\text{join}) \text{ student}$ b) $\text{syar} \geq 2009(\text{takes} \bowtie (\text{join}) \text{ student})$ c) $\pi_{ID, name, course id} (\text{student} \bowtie (\text{join}) \text{ takes})$	Understand	CACS005.07
<b>UNIT – III</b>			
<b>PART – A (Short Answer Questions)</b>			
1	Discuss the basic form of SQL query?	Understand	CACS005.08
2	What is Null Values.	Remember	CACS005.08
3	Illustrate foreign key constraint?	Understand	CACS005.08
4	Discuss Assertions?	Understand	CACS005.08
5	Demonstrate how to add a NOT NULL column to a table?	Understand	CACS005.08
6	Define a trigger.	Remember	CACS005.08
7	Define redundancy? Illustrate redundancy and the problems that it can cause?	Remember	CACS005.08
8	What is functional dependency? Why are some functional dependencies trivial?	Remember	CACS005.08
9	Demonstrate transitive dependency? Give an example?	Understand	CACS005.08
10	Define Second Normal Form?	Remember	CACS005.08
11	Explain Third Normal Form with an example?	Remember	CACS005.08
12	Define Fourth Normal Form?	Remember	CACS005.08
<b>PART – B (Long Answer Questions)</b>			
1	Define trigger and explain its three parts? Differentiate row level and statement level triggers?	Remember	CACS005.08
2	Illustrate Group by and Having clauses with examples?	Understand	CACS005.08
3	Discuss about Complex integrity constraints in SQL?	Understand	CACS005.08
4	a. Define a nested query? b. Define a nested query to find the names of sailors who have reserved both a red and green boat? c. Define a nested query to find the names of sailors who have reserved all boats?	Remember	CACS005.07
5	a. Discuss correlated nested queries? b. Discuss a correlated nested query to find the names of sailors who have reserved a red boat? c. Discuss a correlated nested query to find the names of sailors who have not reserved a red boat?	Understand	CACS005.07
6	Describe properties of decompositions?	Remember	CACS005.08
7	Compare and contrast BCNF with 3NF?	Understand	CACS005.08

8	Illustrate Multivalued dependencies and Fourth normal form with example?	Understand	CACS005.08
9	Define functional dependencies. How are primary keys related to FD's?	Remember	CACS005.08
10	Illustrate redundancy and the problems that it can cause?	Understand	CACS005.08
11	Why are certain functional dependencies called trivial functional dependencies?	Remember	CACS005.08
<b>PART – C (Problem Solving and Critical Thinking Questions)</b>			
1	<p>Consider the following relational schema  Employee (empno,name,office,age)  Books(isbn,title,authors,publisher)  Loan(empno, isbn,date)  Express the following queries in SQL.</p> <ol style="list-style-type: none"> <li>Find the names of employees who have borrowed a book Published by McGraw-Hill?</li> <li>Find the names of employees who have borrowed all books Published by McGraw-Hill?</li> <li>Find the names of employees who have borrowed more than five different books published by McGraw-Hill?</li> <li>For each publisher, find the names of employees who have borrowed?</li> </ol>	Understand	CACS005.06
2	<p>Consider the following schema given. The primary keys are underlined.  Sailors(<u>sailor-id</u>, sailor-name, sailor-rating, sailor-age)  Boats(<u>boat-id</u>, boat-name, boat-color)  Reserves(<u>sailor-id</u>, <u>boat-id</u>,day)  Discuss the Nested queries to.</p> <ol style="list-style-type: none"> <li>Find the names of sailors who have reserved boat number 120</li> <li>Find the names of sailors who have reserved a green boat</li> <li>Find the names of sailors who have not reserved a green boat</li> <li>Find the names of sailors with the highest rating</li> </ol>	Understand	CACS005.07
3	<p>Consider the following database.  Employee (employee-name, street, city)  Works (employee-name, company-name, salary)  Company (company-name, city)  Manager (employee-name, manager-name)  Give an SQL expression in the relational algebra,tuple relational calculus, and the domain relational calculus, for the following query.  Find the names of all employees who work for estate bank.</p>	Understand	CACS005.06
4	<p>Consider the following schema:  Suppliers(sid: integer, sname: string, address: string)  Parts(pid: integer, pname: string, color: string)  Catalog(sid: integer, pid: integer, cost: real)</p>	Remember	CACS005.06
5	<p>Consider the following schema: Suppliers(sid: integer, sname: string, address: string)  Parts(pid: integer, pname: string, color: string) Catalog(sid: integer, pid: integer, cost: real)  The Catalog relation lists the prices charged for parts by Suppliers. Answer the following questions: Give an example of an updatable view involving one relation. Give an example of an updatable view involving two relations. Illustrate an example of an insertable-into view that is updatable. Give an example of an insertable-into view that is not updatable.</p>	Understand	CACS005.07
6	Define BCNF. How does BCNF differ from 3NF? Explain with an example.	Understand	CACS005.06
7	Suppose that we decompose the schema $R = (A, B, C, D, E)$ into $(A, B, C)$ $(A, D, E)$ . Show that this decomposition is a lossless-join decomposition if the following set F of functional dependencies holds: $A \rightarrow BC$ $CD \rightarrow E$ $B \rightarrow D$ $E \rightarrow A$	Remember	CACS005.06
8	Explain why 4NF is a normal form more desirable than BCNF	Understand	CACS005.06



9	Explain what is meant by repetition of information and inability to represent information. Explain why each of these properties may indicate a bad relational database design.	Understand	CACS005.06
10	Suppose that we have the following three tuples in a legal instance of a relation schema S with three attributes ABC (listed in order): (1,2,3), (4,2,3), and (5,3,3). Which of the following dependencies can you infer does not hold over schema S? (a) $A \rightarrow B$ , (b) $BC \rightarrow A$ , (c) $B \rightarrow C$	Understand	CACS005.06
<b>UNIT – IV</b>			
<b>PART – A (Short Answer Questions)</b>			
1	Define a Transaction? List the properties of transaction	Remember	CACS005.12
2	Explain different phases of transaction?	Understand	CACS005.12
3	Discuss recoverable schedules?	Understand	CACS005.12
4	Illustrate cascade less schedules?	Understand	CACS005.12
5	Explain the Two Phase Commit protocol with an example?	Remember	CACS005.12
6	Demonstrate the implementation of Isolation?	Understand	CACS005.12
7	Discuss the Procedure to test Serializability?	Understand	CACS005.12
8	Explain about different types of locks?	Understand	CACS005.12
9	Discuss about Failure Classification?	Understand	CACS005.12
10	What is checkpoint?	Remember	CACS005.12
11	Discuss the failures that can occur with loss of Non-volatile storage?	Understand	CACS005.12
12	Demonstrate Conflict Serializability?	Understand	CACS005.12
13	Explain View Serializability?	Understand	CACS005.12
<b>PART – B (Long Answer Questions)</b>			
1	Explain ACID properties and Illustrate them through examples?	Understand	CACS005.13
2	Discuss How do you implement Atomicity and Durability?	Understand	CACS005.13
3	Illustrate Concurrent execution of transaction with examples?	Understand	CACS005.13
4	Discuss Serializability in detail?	Understand	CACS005.13
5	Discuss two phase locking protocol and strict two phase locking protocols?	Understand	CACS005.13
6	Describe Timestamp based locking protocols?	Remember	CACS005.13
7	Describe Validation-based locking protocols?	Remember	CACS005.13
8	List the ACID properties. Explain the usefulness of each	Understand	CACS005.13
9	Explain in detail Storage structure?	Understand	CACS005.13
10	Discuss Deferred database modification and Immediate database modification?	Understand	CACS005.13
11	Discuss how do you recover from Concurrent transactions?	Understand	CACS005.13
12	Explain Buffer Management?	Understand	CACS005.13
13	Explain different types of Advanced Recovery Techniques?	Remember	CACS005.13
14	Explain in detail about Remote Backup systems?	Understand	CACS005.13
<b>PART – C (Problem Solving and Critical Thinking Questions)</b>			
1	Database-system implementers have paid much more attention to the ACID properties than have file-system implementers. Why might this be the case?	Remember	CACS005.12
2	Analyze which of the following concurrency control protocols ensure both conflict serializability and freedom from deadlock? Explain the following: a. 2-phase locking b. Time-stamp ordering	Remember	CACS005.13
3	Suppose that we have only two types of transactions, T1 and T2. Transactions preserve database consistency when run individually. We have defined several integrity constraints such that the DBMS never executes any SQL statement that brings the database into an inconsistent state. Assume that the DBMS does not perform any concurrency control. Give an example schedule of two transactions T1 and T2 that satisfies all these conditions, yet produces a database instance that is not the result of any serial execution of T1 and T2.	Understand	CACS005.13

4	Suppose that there is a database system that never fails. is a recovery manager required for this system. Explain?	Understand	CACS005.13
5	Explain the 'Immediate database Modification' technique for using the Log to Ensure transaction atomicity despite failures?	Understand	CACS005.13
6	What is a recoverable schedule? Why is recoverability of schedules desirable? Are there any circumstances under which it would be desirable to allow nonrecoverable schedules? Explain your answer.	Understand	CACS005.13
7	Consider the following two transactions: T31: read(A); read(B); if A = 0 then B := B + 1; write(B). T32: read(B); read(A); if B = 0 then A := A + 1; write(A). Add lock and unlock instructions to transactions T31 and T32, so that they observe the two-phase locking protocol. Can the execution of these transactions result in a deadlock explain?	Understand	CACS005.13
8	During its execution, a transaction passes through several states, until it finally commits or aborts. List all possible sequences of states through which a transaction may pass. Explain why each state transition may occur.	Understand	CACS005.13
9	Since every conflict-serializable schedule is view serializable, why do we emphasize conflict serializability rather than view serializability?	Remember	CACS005.13
10	What are the roles of the Analysis, Redo, and Undo phases in ARIES?	Remember	CACS005.13

## UNIT – V

### PART – A (Short Answer Questions)

1	When is it preferable to use a dense index rather than a sparse index? Explain your answer.	Remember	CACS005.15
2	What is Clustered Index?	Understand	CACS005.15
3	What is the difference between a primary index and a secondary index?	Remember	CACS005.15
4	Define Tree Indexing?	Remember	CACS005.15
5	Explain Hash based Indexing?	Understand	CACS005.15
6	Explain the intuition for Tree Indexes?	Understand	CACS005.15
7	Define Indexed Sequential Access Method?	Remember	CACS005.15
8	Discuss about Overflow pages and Locking considerations of ISAM?	Understand	CACS005.15
9	Discuss the Cost model of Heap files?	Understand	CACS005.15
10	Illustrate the Cost model of Sorted files?	Understand	CACS005.15
11	Discuss the Cost model of Clustered files?	Understand	CACS005.15
12	Explain the impact of Workload on Indexes?	Understand	CACS005.15

### PART – B (Long Answer Questions)

1	Discuss in detail about Hash based Indexing and Tree based Indexing?	Understand	CACS005.15
2	Compare I/O costs for all File Organizations?	Understand	CACS005.15
3	Explain in detail about ISAM?	Remember	CACS005.15
4	Explain B+ trees? Discuss about this Dynamic Index Structure?	Understand	CACS005.15
5	Demonstrate searching a given element in B+ trees? Explain with example?	Understand	CACS005.15
6	Illustrate insertion of an element in B+ trees with example?	Remember	CACS005.15
7	Illustrate deletion of an element in B+ trees with example?	Understand	CACS005.15
8	Discuss about Static Hashing in detail?	Understand	CACS005.15
9	Explain in detail about Extendible Hashing?	Remember	CACS005.15
10	Explain in detail about Linear Hashing?	Remember	CACS005.15
11	Compare and Contrast Extendible Hashing with Linear Hashing?	Understand	CACS005.15



<b>PART – C (Problem Solving and Critical Thinking Questions)</b>			
1	Consider a B+-tree in which the maximum number of keys in a node is 5. Calculate the minimum number of keys in any non-root node?	Understand	CACS005.15
2	In the index allocation scheme of blocks to a file, Calculate on what maximum possible size of the file depends?	Remember	CACS005.15
3	A clustering index is defined on the fields of which type? Analyze them.	Understand	CACS005.15
4	Calculate the minimum space utilization for a B+ tree index?	Understand	CACS005.15
5	Explain about the B -tree and the structure of B +- tree in detail with an example.	Remember	CACS005.15
6	<p>Consider the B+ tree index of order <math>d = 2</math> shown in Figure 10.1.</p> <ol style="list-style-type: none"> <li>1. Show the tree that would result from inserting a data entry with key 9 into this tree.</li> <li>2. Show the B+ tree that would result from inserting a data entry with key 3 into the original tree. How many page reads and page writes does the insertion require?</li> <li>3. Show the B+ tree that would result from deleting the data entry with key 8 from the original tree, assuming that the left sibling is checked for possible redistribution.</li> <li>4. Show the B+ tree that would result from deleting the data entry with key 8 from the original tree, assuming that the right sibling is checked for possible redistribution.</li> <li>5. Show the B+ tree that would result from starting with the original tree, inserting a data entry with key 46 and then deleting the data entry with key 52.</li> <li>6. Show the B+ tree that would result from deleting the data entry with key 91 from the original tree.</li> </ol>	Understand	CACS005.15
<p style="text-align: center;">Figure 10.1 Tree for Exercise 10.1</p>			
7	<p>Construct a B+- tree for the following set of key values. (2,3,5,7,11,17,19,23,29,31). Assume that the tree is initially empty and values are added in ascending order. Construct B+- tree for the cases where the number of pointers that will fit in one node is as follows.</p> <ol style="list-style-type: none"> <li>(a) four</li> <li>(b) six</li> <li>(c) eight</li> </ol>	Understand	CACS005.15
8	Explain the distinction between closed and open hashing. Discuss the relative merits of each technique in database applications.	Understand	CACS005.15
9	A clustering index is defined on the fields of which type? Explain	Understand	CACS005.15
10	Suppose that we are using extendable hashing on a file that contains records with the following search-key values: 2,3,5,7,11,17,19,23,29,31. Show the extendable hash structure for this file if the hash function is $h(x) = x \bmod 8$ and buckets can hold three records.	Remember	CACS005.15

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