

17/05/18

1. What is a weak entity ? Give example.
2. Define a foreign key. Give example.
3. What is data definition language ? Give example.
4. Outline the steps involved in query processing.
5. What is serializability ?
6. State the difference between a shared lock and an exclusive lock.
7. What is a hash function? Give example.
8. Define data mining.
9. What is a distributed database management system ?
10. State the difference between classification and clustering.

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## PART – B

(5×13=65 Marks)

11. a) Explain the select, project, Cartesian product and join operations in relational algebra with an example. (13)  
(OR)
- b) What is database normalization ? Explain first normal form, second normal form and third normal form with an example. (13)
12. a) Explain the aggregate functions in SQL with an example. (13)  
(OR)
- b) What is query optimization ? Outline the steps in query optimization. (13)
13. a) i) During 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 ? (6)  
ii) Explain with an example the properties that must be satisfied by a transaction. (7)  
(OR)
- b) i) What is concurrency control ? Explain the two phase locking protocol with an example. (7)  
ii) Explain conflict serializability and view serializability. (6)
14. a) What is hashing ? Explain static hashing and dynamic hashing with an example. (13)  
(OR)
- b) Outline the features of the following databases :  
i) Parallel databases. (7)  
ii) Multimedia databases. (6)
15. a) i) Present an overview of database security. (8)  
ii) Explain with diagrammatic illustration the architecture of a distributed database management system. (5)  
(OR)
- b) Explain the necessary characteristics a system must satisfy to be considered as an object oriented database management system. (13)

## PART – C

(1×15=15 Marks)

16. a) Consider the following scenario :

A university registrar's office maintains data about the following entities :  
(a) courses, including number, title, credits, syllabus and prerequisites  
(b) course offerings, including course number, year, semester, section number, instructor, timings and classroom (c) students, including student-id, name, and program and (d) instructors, including identification number, name, department and title. Further, the enrollment of students in courses and grades awarded to students in each course they are enrolled for must be appropriately modeled.

- i) Model an entity relationship diagram for the above scenario. (6)  
ii) Map the entity relationship diagram you have modeled to relations. (9)

(OR)

- b) Apply the Apriori algorithm for discovering frequent item sets to the following data set :

Trans ID	Items Purchased
101	Mulberry, Raspberry, Cherry
102	Mulberry, Papaya
103	Papaya, Mango
104	Mulberry, Raspberry, Cherry
105	Passion Fruit, Cherry
106	Passion Fruit
107	Passion Fruit, Papaya
108	Mulberry, Raspberry, Guava, Cherry
109	Guava, Mango
110	Mulberry, Raspberry

Use 0.3 for the minimum support value.

(15)



Reg. No. : 

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**Question Paper, Code : 52858**

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Third/Fifth/Eighth Semester

Computer Science and Engineering

CS 6302 — DATABASE MANAGEMENT SYSTEMS

(Common to Mechanical and Automation Engineering/Mechatronics  
Engineering/Information Technology)

(Regulation 2013)

(Also common to PTCS 6302 – Database Management Systems for B.E. (Part-Time) -  
Second Semester – Computer Science and Engineering – Regulation 2014)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is a primary key? Give example.
2. Define denormalization.
3. What is data definition language?
4. Outline the use of commit and rollback.
5. Name the properties that must be satisfied by a transaction.
6. Outline the need for concurrency control.
7. State the difference between B tree and B<sup>+</sup> tree indexing.
8. Define a data mart.
9. What is cryptography?
10. What is persistence in object oriented databases?



PART B — (5 × 13 = 65 marks)

11. (a) Explain select, project, Cartesian product and equality join in relational algebra with an example. (13)

Or

- (b) Consider a relation  $R(A, B)$ .  $R$  is in first normal form. Justify  $R$  is in second normal form, third normal form and BCNF. (13)

12. (a) Consider the following relations:

EMPLOYEE (ENO, NAME, DATE\_BORN, GENDER,

DATE\_OF\_JOINING, DESIGNATION, BASIC\_PAY, DNO)

DEPARTMENT (DNO, DNAME)

The primary key is underlined. Write SQL queries to perform the following:

- (i) Display the employee number, name, department number and department name of all employees. (3)
- (ii) List the details of employees who earn less than the average basic pay of all employees. (4)
- (iii) List the department number and number of employees in each department. (4)
- (iv) List the details of employees who work for DNO = 'CSE'. (2)

Or

- (b) Outline the steps in query processing with a diagram and an example. (13)

13. (a) (i) Explain time stamp based concurrency control algorithm with an example. (6)
- (ii) What is dead lock? Explain the four conditions for dead lock with an example. (7)

Or

- (b) Outline the various problems that occur due to concurrent transactions. Also, outline the two phase locking protocol used for concurrency control with an example.

14. (a) (i) Outline static hashing and dynamic hashing with an example. (8)
- (ii) Distinguish between primary index and secondary index. Give example. (5)

Or

- (b) Pretest as outline of the following

- (i) Distributed database management systems. (4)
- (ii) Spatial databases. (5)
- (iii) Data warehousing. (4)

15. (a) (i) What is database access control? Compare the processes of discretionary and mandatory access control mechanisms. (8)
- (ii) Outline the structure of an XML document with an example. (5)

Or

- (b) What is an object oriented database management system? Outline the characteristics of an object oriented database management system. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Consider the following case study describing the academic functioning of a college:

- A college has many departments.
- A department would have many students as well as employs many faculty members
- A student can register into various courses; similarly a course can be registered by many students
- A student lives in a single hostel but a hostel accommodates many students
- A department offers many courses but a particular course is offered by a particular department
- A faculty teaches many courses. A course is taught by many faculties.

Model a E-R diagram for the above scenario. (15)

Or

- (b) Outline the steps in the Apriori algorithm for mining association rules with an example. (15)



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**Question Paper Code : 50383**

**B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017**

**Third/Fifth/Eighth Semester**

**Computer Science and Engineering**

**CS 6302 – DATABASE MANAGEMENT SYSTEMS**

**(Common to Mechanical and Automation Engineering, Mechatronics**

**Engineering, Information Technology)**

**(Regulations 2013)**

**Time : Three Hours**

**Maximum : 100 Marks**

**Answer ALL questions**

**PART – A**

**(10×2=20 Marks)**

1. State the levels of abstraction in a DBMS.
2. What are the problems caused by redundancy ?
3. What is static SQL and how is it different from dynamic SQL ?
4. State the steps in query processing.
5. State need for concurrency.
6. Define ACID properties.
7. What are data fragmentations ? State the various fragmentations with example.
8. Define ordered indices with example.
9. Distinguish between threats and risks.
10. State the function of XML schema.



11. a) i) Differentiate between foreign key constraints and referential integrity constraints with suitable example. (6)  
 ii) Distinguish between lossless-join decomposition and dependency preserving decomposition. (7)  
 (OR)
- b) State and explain the architecture of DBMS. Draw the ER diagram for banking systems. (Home loan applications). (13)
12. a) i) State and explain the command DDL, DML, DCL with suitable example. (7)  
 ii) Justify the need of embedded SQL. Consider the relation student (studentno, name, mark and grade). Write embedded dynamic SQL statements in C language to retrieve all the students' records whose mark is more than 90. (6)  
 (OR)
- b) Explain the catalog information for cost estimation for selection and sorting operation in database. (13)
13. a) State and explain the lock based concurrency control with suitable example. (13)  
 (OR)
- b) When does deadlock occurs? Explain two-phase commit protocol with example. (13)
14. a) i) What are the various feature of distributed database versus centralized database system? (6)  
 ii) Explain the B+ tree indexes on multiple keys with a suitable example. (7)  
 (OR)
- b) Explain the distinction between static and dynamic hashing. Discuss the relative merits of each technique in database applications. (13)
15. a) i) Distinguish between classification and clustering with example. (6)  
 ii) State the necessity for crawling and indexing the web. Explain the procedure for it. (7)  
 (OR)
- b) Describe the various component of data warehouse and explain the different data model used to store data with example. (13)

16. a) Explain in detail about spatial and multimedia databases. (15)  
 (OR)
- b) Write the DDL, DML, DCL commands for the students database.  
 Which contains student details : name, id, DOB, branch, DOJ.  
 Course details : Course name, Course id, Stud. id, Faculty name, id, marks. (15)





PART B — (5 × 13 = 65 marks)

11. (a) 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. State any assumptions you make.

Or

- (b) 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).
- (i) Which of the following dependencies can you infer does not hold over, schema S?  
(1)  $A \rightarrow B$  (2)  $BC \rightarrow A$  (3)  $B \rightarrow C$ .
- (ii) Can you identify any dependencies that hold over S?

12. (a) Consider the following relational schema:

Employee (empno, name, office, age)

Books (isbn, title, authors, publisher)

Loan (empno isbn, date)

Write the following queries in relational algebra.

- (i) Find the names of employees who have borrowed a book Published by XYZ Ltd.,
- (ii) Find the names of employees who have borrowed all books Published by XYZ Ltd.,
- (iii) Find the names of employees who have borrowed more than five different books published by XYZ Ltd.,
- (iv) For each Publisher, find the names of employees who have borrowed more than five books of that Publisher.

Or

- (b) (i) Since indices speed query processing why might they not be kept on several search keys? List as many reasons as Possible.
- (ii) How does a DBMS represent a relational query evaluation plan?

13. (a) Explain the methods used to handle Deadlock.

Or

- (b) (i) Differentiate strict two phase locking protocol and rigorous two phase locking protocol. (6)
- (ii) How the time stamps are implemented? Explain. (7)

14. (a) (i) Explain why allocations of records to blocks affect database system performance significantly. (5)
- (ii) Explain the concept of Deadlock avoidance and prevention in detail. (8)

Or

- (b) (i) Explain how reliability can be improved through redundancy? (6)
- (ii) How the records are represented and organized in files. Explain with suitable example. (7)

15. (a) Discuss the issues and steps involved in building a data warehouse. How the concept of relational view is related to data warehouse and data marts?

Or

- (b) (i) Compare and contrast between object oriented and XML databases. (7)
- (ii) Give XML representation of bank management system and also explain about Document Type Definition and XML schema. (6)

PART C — (1 × 15 = 15 marks)

16. (a) Given: VAR Exam\_Marks BASE RELATION { Student\_ID SID, Course\_ID CID, Mark INTEGER} KEY {Student ID, Course ID};
- Write down the relational algebra expression to give, for each pair of students sitting in the same exam, the absolute value of difference between the marks. Assume you can write ABS (x) to obtain the absolute value of x.

Or

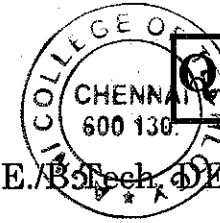
- (b) Give an example of a relation that is in 3NF but not in BCNF. How will you convert that relation into BCNF.





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**Question Paper Code : 91393**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019

Third/Fifth/Eighth Semester

Computer Science and Engineering

CS 6302 – DATABASE MANAGEMENT SYSTEMS

(Common to Computer Science and Engineering/Mechanical and Automation Engineering/Mechatronics Engineering/Information Technology)

(Regulations – 2013)

(Also Common to PTCS 6302 – Database Management Systems for B.E.

(Part-Time) – Second Semester – Computer Science and Engineering –

Regulations 2014)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. What are the major drawbacks of File Processing System ?
2. What is meant by weak entity set ? Explain with an example.
3. Write short note on Aggregate functions. Give examples.
4. Can a view be defined with other view ? Explain with an example.
5. Differentiate Loss less join decomposition and Lossy Join decomposition.
6. How do you estimate the cost of the Hash Join ? How is it different from Hybrid Hash Join ?
7. Give the different forms of query that are possible with Multimedia Database Systems.
8. Compare and Contrast Range Partitioning and Hash Partitioning.
9. Give examples of different query languages of Object Relational Databases.
10. Mention few applications of Data Mining.

## PART - B

(5×13=65 Marks)

11. a) Define Normalization. Explain the different levels of Normal forms for the relation given below.

Project\_employee table (Proj.Num, Proj.Name, Empid, Empname, Designation, Hourly charges, total no. of hours worked, Total Charges).

(Note : Fill the table with appropriate Values)

(OR)

- b) Explain in detail on the Codd's rule on relational database.

12. a) Consider the following relational schema

Emp (eid:integer, ename:string, salary:real)

Works (eid:integer, did:integer)

Dept (did:integer, dname:string, \_managerid: integer, floornum: integer)

Write the following queries in QBE. Be sure to underline your variables to distinguish them from your constants.

1. Print the names of all employees who work on the 10<sup>th</sup> floor and gets less than Rs. 50,000 as their salary.
2. Print the names of all managers who manage three or more departments on the same floor.
3. Give every employee who works in the toy department a 10% raise.
4. Print all of the attributes for employees who work in some department that employee ABC also works in.
5. Print the name of each department that has a manager whose last name is PABC and who is neither the highest paid nor the lowest paid employee in the department.

(OR)

- b) Prove the statement "When the column of a view is directly derived from a column of a base table, that column inherits any constraints that apply to the column of the base table" by using suitable example.

13. a) Elaborate on the following

- i) Two phase locking protocol.
- ii) Graph based protocol.

(7)

(6)

(OR)

- b) Explain Concurrency Control and Deadlock in relation to databases with examples.

14. a) i) Elaborate on Web Databases.

(9)

- ii) Explain about the advantage of using RAID.

(4)

(OR)

- b) Explain how B and B+ tree are processed ? Give one example for each.

15. a) Discuss in detail on the recovery techniques that can be applied to the common types of database failure.

(OR)

- b) i) Give a detailed note on the challenges involved in mining spatial data ?

(7)

- ii) Explain the concept of clustering in Data Mining.

(6)

## PART - C

(1×15=15 Marks)

16. a) Elaborate on :

- i) Distributed databases.

(8)

- ii) Information Retrieval.

(7)

(OR)

- b) i) Explain in detail about Database Security.

(8)

- ii) XML Databases.

(7)