Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 80099

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

Third/Fourth Semester

Information Technology

CS 8492 — DATABASE MANAGEMENT SYSTEMS

(Common to Computer Science and Engineering/Computer and Communication Engineering)

(Regulation 2017)

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is a data model? List the types of data model used.
2. List any eight applications of DBMS.
3. Give the properties of decomposition.
4. Define the terms Entity set and Relationship set.
5. What are the states of transaction?
6. What is meant by log-based recovery?
7. Define dense index.
8. Mention all the operations of files.
9. Mention two features of Multimedia databases.
10. Compare sequential access devices versus random access devices with an example.

PART B — (5 × 13 = 65 marks)

11. (a) Explain the three different groups of data models with suitable examples.

Or

(b) Describe about the static and dynamic SQL in detail.

12. (a) What is normalization? Explain in detail about all Normal forms.

Or

(b) Briefly discuss about the functional dependency concepts.

13. (a) Discuss in detail about the testing of serializability.

Or

(b) Explain deferred and immediate modification versions of the log based recovery scheme.

14. (a) What is RAID? Briefly discuss about RAID.

Or

(b) Describe the structure of B+ tree and give the algorithm for search in the B+ tree with example.

15. (a) Discuss in detail about the distributed databases.

Or

(b) Explain in detail about the Deductive DB and Spatial DB.

PART C — (1 × 15 = 15 marks)

(Application / Design / Analysis / Evaluation /Creativity/Case Study questions)

16. (a) Discuss in detail about the ACID properties of a transaction.

Or

(b) What is concurrency control? How it is implemented in DBMS? Briefly elaborate with suitable diagrams and examples.

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x) Departments have a professor (known as the chairman) who runs the department.

xi) Professors work in one or more departments, and for each department that they work in, a time percentage is associated with their job.

xii) Graduate students have one major department in which they are working on their degree.

xiii) Each graduate student has another, more senior graduate student (known as a student advisor) who advises him or her on what courses to take.

Design and draw an ER diagram that captures the information about the university.

Use only the basic ER model here; that is, entities, relationships and attributes. Be sure to indicate any key and participation constraints. **(5+10)**

(OR)

b) i) For the following relation schema R and set of functional dependencies F : R(A, B, C, D, E), F = { AC → E, B → D, E → A}. List all candidate keys. **(6)**

ii) Consider the Table-16 and answer to queries given below. **(9)**

Table-16 User_personal.

Userid	U_Email	Fname	Lname	City	State	Zip
MA12	mani@ymail.com	Manish	Jain	Bilaspur	Chatisgarh	458991
PO45	pujag@gmail.com	Pooja	Magg	Kacch	Gujrat	832212
LA33	lavle98@jj.com	Lavleen	Dhalla	Raipur	Chatisgarh	853578
CH99	cheki9j@ih.com	Chimal	Bedi	Trichy	Tamil Nadu	632011
DA74	danu58@g.com	Dany	James	Trichy	Tamil Nadu	645018

1) Is this table in First Normal Form-1NF ? Justify and normalize to 1NF if needed.

2) Is this table in Second Normal Form-2NF ? Justify and normalize to 2NF if needed.

3) Is User_personal in Third Normal Form-3NF ? Justify and normalize to 3NF if needed.

20/11/19/AN

Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 90156

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019
Third/Fourth/Fifth Semester
Computer Science and Engineering
CS 8492 – DATABASE MANAGEMENT SYSTEMS
(Common to Computer and Communication Engineering /Mechanical and Automation Engineering/Information Technology)
(Regulations 2017)

Time : Three Hours Maximum : 100 Marks

Answer ALL questions

PART – A **(10×2=20 Marks)**

1. What are the four main characteristics that differentiate the database approach from the file-processing approach ?

2. Express in relational algebra, the division operation(/) using the project, cartesian product and minus operations. Give a simple example.

3. 'Boyce-Codd normal form is found to be stricter than third normal form'. Justify the statement.

4. What is the significance of "participation role name" in the description of relationship types ?

5. List the responsibilities of a DBMS has whenever a transaction is submitted to the system for execution ?

6. Brief any two violations that may occur if a transaction executes a lower isolation level than Serializable.

7. How do you represent leaf node of a B^+ tree of order p ?

8. Which cost components contribute to query execution ?

9. List information types of documents necessary for relevance ranking of documents in IR.

10. What one could understand from allocation schema ?

PART – B (5×13=65 Marks)

11. a) i) 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 key fields are underlined and the domain of each field is listed after the field name. Therefore sid is the key for Suppliers, pid is the key for Parts and sid and pid together form the key for Catalog. The Catalog relation lists the prices charged for parts by suppliers. (6)

Write the following queries in relational algebra :

1) Find the sids of suppliers who supply some red or green part.
2) Find the sids of suppliers who supply some red part or are at 221 Packer Street.
3) Find the pids of parts supplied by atleast two different suppliers.

ii) Sketch the typical component modules of DBMS. Indicate and explain the interactions between those modules of the system. (7)

(OR)

b) i) Consider the schema given in question no. 11.a) i) and write the following queries in SQL. (8)

1) Find the names of suppliers who supply some red part.
2) Find the sids of suppliers who supply some red part and some green part.
3) Find the sids of suppliers who supply every red part.
4) Find the pids of parts supplied by atleast two different suppliers.

ii) Explain the three schema architecture with a neat diagram. (5)

12. a) i) Discuss in detail the steps involved in the ER-to-Relational mapping in the process of relational database design. (7)

ii) Exemplify the multi-value dependency and the fourth normal form-4NF. (6)

(OR)

b) i) Explain with suitable example, the constraints of specialization and generalization in ER data modeling. (7)

ii) Exemplify the join dependency and the fifth normal form-5NF. (6)

13. a) i) Discuss elaborately the two-phase locking protocol that ensures serializability. (9)

ii) Brief the states of a transaction with a neat diagram. (4)

(OR)

b) i) Narrate the actions that are considered for deadlock detection and the recovery from deadlock. (9)

ii) Discuss the properties of a transaction that ensure integrity of data in the database system. (4)

14. a) i) Explain the various levels of RAID systems. (10)

ii) Why data dictionary storage is important ? (3)

(OR)

b) i) With simple algorithms explain the computing of Nested-loop join and Block Nested-loop join. (10)

ii) Sketch and concise the basic steps in Query Processing. (3)

15. a) i) Illustrate the usage of OQL, the DMG's query language. (9)

ii) Brief on the methods to store XML documents. (4)

(OR)

b) i) Illustrate the approaches to store relations in distributed database. (9)

ii) How effectiveness of retrieval is measured ? Discuss. (4)

PART – C (1×15=15 Marks)

16. a) Consider the following information about a university database :

i) Professors have an SSN, a name, an age, a rank and a research specialty.
ii) Projects have a project number, a sponsor name (e.g., NSF), a starting date, an ending date and a budget.
iii) Graduate students have an SSN, a name, an age and a degree program (e.g., M.S. or Ph.D.).
iv) Each project is managed by one professor (known as the project's principal investigator).
v) Each project is worked on by one or more professors (known as the project's co-investigators).
vi) Professors can manage and/or work on multiple projects.
vii) Each project is worked on by one or more graduate students (known as the project's research assistants).
viii) When graduate students work on a project, a professor must supervise their work on the project. Graduate students can work on multiple projects, in which case they will have a (potentially different) supervisor for each one.
ix) Departments have a department number, a department name and a main office.

Reg. No. :

17/05/18

Question Paper Code : 40901

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018
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. 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.

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)

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26/4/19 AN

Reg. No. :

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^+ 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 sytems. (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 offerred 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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Reg. No. : | | | | | | | | | | | | |

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.

PART – B (5×13=65 Marks)

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)

PART – C (1×15=15 Marks)

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)

24/11/18 (AN)

Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 20359

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Third/Fifth/Eighth Semester

Computer Science and Engineering

CS 6302 – DATABASE MANAGEMENT SYSTEMS

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

(Regulations 2013)

(Also common PTCS 6302 – Database Management System 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. Mention some of the major responsibilities of a database administrator.
2. Give an example for one to one and one to many relationships.
3. What are aggregate functions? And list the aggregate functions supported by SQL?
4. Write a SQL statement to find the names and loan numbers of all customers who have a loan at XYZ branch.
5. Highlight the role of a recovery management component.
6. Give the drawbacks of shadow-paging technique.
7. Why is a B+- tree usually preferred as an access structure to a data file?
8. What are the ways in which the variable-length records represented in database systems?
9. How are transactions performed in Object oriented database?
10. How spatial databases are more helpful than active database?

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.

26/11/19/AN

Reg. No. :

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 10th 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. (7)

ii) Graph based protocol. (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)