

Reg. No.

Question Paper Code : J1503

M.Sc. DEGREE EXAMINATION, FEBRUARY/MARCH 2018.

First Semester

Computer Science

DCS 7103 — DATABASE MANAGEMENT SYSTEM

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define generalization.
 2. Compare Embedded SQL with dynamic SQL.
 3. Outline the desirable properties of decomposition.
 4. Why certain functional dependencies called trivial functional dependencies?
 5. Differentiate the terms UNDO and REDO process during the transaction processing.
 6. What are ACID properties of a transaction?
 7. List out the physical storage media.
 8. What is static hashing?
 9. How XML differs from HTML?
 10. What are the advantages of distributed databases?

PART B — $(5 \times 13 = 65$ marks)

11. (a) Construct an ER diagram for hospital management system with a set of patients and a set of doctors. Associate with each patient a log of the various tests and examinations conducted. (13)

Or

- (b) Explain the architecture of database system. (13)

12. (a) Explain the 2NF, 3NF and BCNF normal forms with examples. (13)

Or

- (b) Compute the closure (F^+) of the following set functional dependencies for the relational schema $R = (A, B, C, D, E)$, and

$F = \{A \rightarrow BC, BC \rightarrow E, B \rightarrow D, E \rightarrow A\}$. List the candidate keys for R. (13)

13. (a) Define Serializability. Explain the types of serializability with examples. (13)

Or

- (b) Consider the following ordering Schedule – ‘S’ of transactions:

T1 : R(A); T1 : A := A+5; T1 ; commit; T2 : R(B); T2 : B := B+5; T3 : R(C); T3 : C := C+5; T3 : C := C+5; T4 : R(A); T4 : A := A+5; T4 : R(D); T4 : D := D+5; T4 : commit; T2 : commit; T3 : commit;

Let the initial value of $A=B=C=D=0$. The system follows log based recovery process of Immediate database modification. The assumption is the concurrency control system uses strict 2PL, and all the transactions share a common disk buffer and single log. Explain what happens during the recovery process, if it occurs a failure at ‘T2 : commit’ statement. (13)

14. (a) Construct a B+ tree for the following set of search key values. (Amala, Dolly, Bala, Sona, Chinna, Ezhil, Falley, Gilda.). Assume the number of pointers in each node as 4. Also do the following Operations Sequentially to the tree that you have constructed,

Insert “Amutha”, Insert “Raja”, Insert “Vickram”, Delete “Sona” and Delete “Gilda”. (13)

Or

- (b) Discuss the steps involved in query processing. (13)

15. (a) Explain the architecture of distributed databases. (13)

Or

- (b) Write note on

(i) Clustering. (7)

(ii) XML databases. (6)

PART C — (1 × 15 = 15 marks)

16. (a) Outline the significance of relational Algebra. (15)

Or

- (b) Give an example to illustrate the SQL facilities for concurrency and recovery process. (15)

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Question Paper Code : BS2503

M.Sc. DEGREE EXAMINATION, AUGUST/SEPTEMBER 2017.

First Semester

Computer Science

DCS 7103 — DATABASE MANAGEMENT SYSTEM

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

(Codes/Tables/Charts to be permitted)

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define unique key.
2. What is Relational Calculus?
3. What is Denormalization?
4. What is Functional Dependency?
5. List the ACID properties of a transaction.
6. What are the two methods for dealing deadlock problem?
7. What is indexing and what are the different kinds of indexing?
8. Define the term file organization.
9. Define Data mining.
10. What are the issues in data warehouse design?

PART B — (5 × 13 = 65 marks)

11. (a) (i) Explain Client/Server architecture in detail. (8)
 (ii) State the three levels of architecture. (5)

Or

- (b) (i) How Relational Calculus is different from Relational Algebra? (6)
 (ii) Write a brief note on different views of data with necessary diagram. (7)

12. (a) What is normalization? Explain different types of normalization with examples. (13)

Or

- (b) (i) Explain serializability with examples. (6)
(ii) What are the different types of joins in SQL? (7)
13. (a) (i) Discuss the various concurrency control protocols. (8)
(ii) Explain the four broad stages in query processing. (5)

Or

- (b) Discuss on lock based Concurrency control Protocol. (13)
14. (a) (i) Write about static hashing and dynamic hashing in detail. (10)
(ii) What are the techniques used to improve the performance of disks in RAID? (3)

Or

- (b) Explain the following with examples :
(i) B tree Index Files (6)
(ii) B+ tree Index Files. (7)
15. (a) (i) What is Data warehousing? What are the different stages in Data Warehousing? (8)
(ii) Explain Distributed databases with examples. (5)

Or

- (b) Explain the following in detail :
(i) XML (5)
(ii) Information Retrieval (4)
(iii) Relevance Ranking. (4)

PART C — (1 × 15 = 15 marks)

16. (a) A university database contains information about professors (identified by a social security number) and courses (identified by a course ID). Each of the following situations concern the relationship set between the teacher and the student. Draw an ER diagram for each situation (assuming that no further constraints hold).

- (i) Professors can teach the same course over several semesters and each offering must be recorded.
- (ii) Each professor teaches exactly one course.
- (iii) Each professor teaches at least one course and some professors may teach multiple courses.
- (iv) Each professor teaches at least one course and some professors must teach all the courses. (15)

Or

- (b) Write a case study on Hospital Management System with suitable table description and ER diagram. (15)
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Question Paper Code : KJ1503

M.Sc. DEGREE EXAMINATION, FEBRUARY/MARCH 2017.

First Semester

Computer Science

DCS 7103 — DATABASE MANAGEMENT SYSTEM

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the advantages of data base systems.
2. Compare network and relational data models.
3. Define join dependencies between relations. Give example.
4. What is denormalization?
5. Expand ACID, RAID, BCNF, XML.
6. Write the significance of save points.
7. What is tertiary storage? Give example.
8. Name any four hashing methods.
9. Define association rule. Give example.
10. What are the uses of crawlers?

PART B — (5 × 16 = 80 marks)

11. (a) Write a program to create and manipulate a student database using embedded SQL. (16)

Or

- (b) Detail on :

- (i) Database system architecture. (8)
- (ii) Relational algebra. (8)

12. (a) Explain the following :
(i) dependency preservation in tables (8)
(ii) data base structure creation. (8)

Or

- (b) Perform normalization on railway reservation system and derive its relations. (16)

13. (a) Give an account on two-phase locking protocol and its implementation. (16)

Or

- (b) Write short notes on :
(i) SQL facilities for recovery. (8)
(ii) need for concurrency control protocol with example. (8)

14. (a) Explain :
(i) B+ tree indexing. (8)
(ii) query processing stages. (8)

Or

- (b) Elaborate on various levels of RAID and its significance. (16)

15. (a) Discuss on :
(i) Relevance ranking. (8)
(ii) OODB. (8)

Or

- (b) Draw the architecture of transaction server system and explain its components. (16)
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Question Paper Code : J1528

M.Sc. DEGREE EXAMINATION, AUGUST/SEPTEMBER 2016.

(From Academic Year – 2015 – New Question Paper Pattern)

First Semester

Computer Science

DCS 7103 – DATABASE MANAGEMENT SYSTEM

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define the two levels of data independence
2. What is a data model?
3. What are the four broad categories of constraints?
4. What do you mean by normalization?
5. Mention the two commonly used concurrency control techniques.
6. What are ACID properties?
7. List out the file organization methods.
8. What is dynamic hashing?
9. Define multi level association rule.
10. Mention the various types of data available in datamining.

PART B — (5 × 13 = 65 marks)

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

Or

- (b) (i) With a neat diagram, explain the structure of a DBMS.
- (ii) Draw an E-R diagram for a small banking database, assuming your own data requirements.

12. (a) (i) Explain about join dependencies with your own example.
(ii) What is a view? How can it be created? Illustrate with an example.

Or

- (b) Write short notes on the following:
(i) Mandatory access control.
(ii) Dependency preservation
13. (a) (i) How can you implement system recovery? Explain.
(ii) Describe the concept of deadlock with suitable example.

Or

- (b) (i) Explain about immediate update and deferred update recovery techniques.
(ii) Explain how Two-phase locking protocol, used in transactions.
14. (a) (i) Give different levels in RAID technology and explain its salient features.
(ii) Describe the different methods of implementing variable length records.

Or

- (b) Mention the purpose of indexing. How this can be done by B+ tree? Explain.
15. (a) (i) Explain the various primitives for specifying Data mining Task.
(ii) Explain about various statistical measures for data mining.

Or

- (b) Discuss the single dimensional boolean association rule mining for transaction database.

PART C — (1 × 15 = 15 marks)

16. (a) Write a PL/SQI, procedure for an application using user-defined and predefined exceptions.

Or

- (b) Discuss the data mining of Multilevel Association rules from transactional databases.

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Question Paper Code : S1503

M.Sc. DEGREE EXAMINATION, FEBRUARY/MARCH 2016.

First Semester

Computer Science

DCS 7103 — DATABASE MANAGEMENT SYSTEM

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is a data model? List out its types.
2. Highlight the difference between the Embedded SQL and Dynamic SQL.
3. Define transitive dependency.
4. Outline the desirable properties of decomposition.
5. Define transaction.
6. Mention the use of check points in the case of Log based recovery systems.
7. Define dense and sparse indices with examples.
8. Describe flash memory.
9. Define Information Retrieval.
10. How data warehouse differs from a database?

PART B — (5 × 16 = 80 marks)

11. (a) (i) How database system is advantageous than file system? State the advantages of a DBS over a file system. (6)
(ii) Explain the Database System structure with a neat diagram. (10)

Or

- (b) For the following employee database
employee(employee-name, Address, Phone)
works(employee-name, company-name, salary)
company(company-name, Address)
manages(employee-name, manager-name)
Draw the ER diagram with all possible components and cardinalities and reduce the design to Relational model. (16)

12. (a) Compute the closure of the following set of functional dependencies $AB \rightarrow C, C \rightarrow D, D \rightarrow A$ for the relation $R = (A, B, C, D)$. Also list the candidate key for R . (16)

Or

- (b) Explain BCNF with suitable example and compare with Third Normal Form. (16)

13. (a) Define Serializability. Explain the types of serializability with examples. (16)

Or

- (b) (i) Explain the Need for Concurrency Control. (8)
(ii) Differentiate the terms UNDO and REDO process during the transaction processing. (8)

14. (a) Explain with a suitable example the addition and deletion operations of B+ tree. (16)

Or

- (b) 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 each bucket can hold 3 records. (16)

15. (a) (i) Explain distributed database architecture with a neat sketch. (8)
(ii) Explain XML databases with an example. (8)

Or

- (b) For the given database find all the frequent item sets using Apriori method with Minimum Support = 30%. (16)

TID	Items bought
100	{f, a, c, d, g, i, m, p}
200	{a, b, c, f, l, m, o}
300	{b, f, h, j, o, w}
400	{b, c, k, s, p}
500	{a, f, c, e, l, p, m, n}

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Question Paper Code : 80503

M.Sc. DEGREE EXAMINATION, AUGUST 2015.

First Semester

Computer Science

DCS 7103 — DATABASE MANAGEMENT SYSTEM

(Regulation 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List out the purpose of the database system.
2. Mention the advanced SQL features.
3. Give an example relation which is in the third normal form, but not in BCNF.
4. What is multivalued dependency?
5. Write down the SQL facilities for recovery.
6. Specify the SQL facilities for concurrency.
7. Define indexing.
8. Differentiate static hashing and dynamic hashing.
9. Indicate any two object oriented databases.
10. Point out any two data mining tools.

PART B — (5 × 16 = 80 marks)

11. (a) (i) With a neat diagram, explain the database system architecture. (10)
(ii) Give an introduction to relational databases. (6)

Or

- (b) Discuss in detail about embedded SQL and dynamic SQL with an example for each. (16)

12. (a) (i) What is functional dependency? Give an example. (4)

(ii) Explain the functional dependencies based normal forms with an example for each. (12)

Or

(b) (i) Discuss in detail about the fourth normal form with an example. (8)

(ii) Explain the fifth normal form with an example. (8)

13. (a) Describe the transaction recovery, system recovery and media recovery. (16)

Or

(b) (i) What is concurrency? (2)

(ii) What is the need for concurrency? (4)

(iii) Explain the locking protocols used for concurrency. (10)

14. (a) (i) Give an overview of physical storage media. (8)

(ii) Write down in detail about B tree index files. (8)

Or

(b) (i) Present an overview of the query processing. (8)

(ii) List out the catalog Information for cost estimation of query processing. (8)

15. (a) (i) Discuss in detail about the architecture of distributed databases. (8)

(ii) Describe about data warehousing. (8)

Or

(b) (i) Write short notes on crawling and indexing the web. (8)

(ii) Explain in detail about XML databases. (8)

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Question Paper Code : 22454

M.Sc. DEGREE EXAMINATION, FEBRUARY/MARCH 2015.

First Semester

Computer Science

DCS 7103 — DATABASE MANAGEMENT SYSTEM

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List out the keys available in relational databases.
2. Mention the different data models of DBMS.
3. Give an example relation which is in the third normal form.
4. What is functional dependency?
5. Write down the need for concurrency.
6. Specify the ACID properties.
7. Define hashing.
8. Differentiate B+ tree index file and B tree index file.
9. Indicate any two XML databases.
10. Point out any two examples of association rules.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the Entity-Relationship model by taking a suitable example. (10)
(ii) Write down the purpose of database system. (6)

Or

- (b) Discuss in detail about relational algebra and relational calculus with an example for each. (16)

12. (a) (i) What is dependency preservation? Give an example. (4)
(ii) Explain the multivalued dependencies based normal form with an example. (12)

Or

- (b) (i) Discuss in detail about the Boyce/Codd normal form with an example. (8)
(ii) Explain the join dependencies based normal form with an example. (8)

13. (a) (i) What is deadlock? (2)
(ii) Write down the SQL facilities for concurrency (4)
(iii) Explain the working principles of two phase locking protocol in concurrency. (10)

Or

- (b) (i) What is recovery? (2)
(ii) Write down the SQL facilities for recovery (4)
(iii) Explain the role of two phase commit and save points in recovery. (10)

14. (a) (i) Give an overview of static hashing and dynamic hashing. (8)
(ii) Write down in detail about B+ tree index files. (8)

Or

- (b) (i) Present an overview of RAID technology. (8)
(ii) List out the catalog information for cost estimation of query processing. (8)

15. (a) (i) Discuss in detail about the transaction processing of distributed databases. (8)
(ii) Describe about data mining. (8)

Or

- (b) (i) Write short notes on classification and clustering. (8)
(ii) Explain in detail about object oriented databases. (8)

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Question Paper Code : 46453

M.Sc. DEGREE EXAMINATION, AUGUST 2014.

First Semester

(Computer Science)

DCS 7103 — DATABASE MANAGEMENT SYSTEM

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is logical data independence?
2. Differentiate File systems and Database Management System.
3. Define triggers.
4. What is insertion anomaly?
5. What are the pitfalls of database design?
6. When is a functional dependency said to be trivial?
7. Give the meaning of the expression ACID transition.
8. When are two schedules said to be conflict equivalent?
9. What is database tuning?
10. What is stripping and mirroring?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the component modules of a DBMS and their interactions with the architecture. (10)
(ii) Construct an ER diagram to a model online book store. (6)

Or

- (b) (i) Explain the basic Relational Algebra operations with the symbol used and an example for each. (10)
- (ii) What are the needs for the development of relational databases? (6)
12. (a) (i) Consider the universal relation $R(A, B, C, D, E, F, G, H, I, J)$ and the set of FD's. $G = (\{A, B\} \rightarrow \{C\}) \rightarrow (\{B, D\} \rightarrow \{E, F\}), \{A, D\} \rightarrow \{G, H\}, \{A\} \rightarrow \{I\}, \{H\} \rightarrow \{J\}$. What is the key of R ? Decompose R into 2NF, then 3NF relations. (2 + 4 + 4)
- (ii) Discuss how schema refinement through dependency analysis and normalization can improve schemas obtained through ER design. (6)

Or

- (b) (i) Explain the use of trigger with your own example. (8)
- (ii) What is a view? How can it be created? Explain with an example. (8)
13. (a) Explain briefly about the working of two phase locking protocol using a sample transaction. (16)

Or

- (b) (i) Explain about immediate update and deferred update recovery techniques. (8)
- (ii) Explain the need for concurrency with illustration. (8)
14. (a) (i) Describe the different types of file organization? Explain using a sketch of each of them with their advantages and disadvantages. (10)
- (ii) Describe static hashing and dynamic hashing. (6)

Or

- (b) Mention the purpose of indexing. How this can be done by B+ tree? Explain. (16)
15. (a) (i) Explain the various primitives for specifying data mining task. (8)
- (ii) Describe the various statistical measures for data mining. (16)

Or

- (b) (i) Explain about information retrieval with an illustration. (8)
- (ii) What do you mean by crawling? Explain the salient features of XML databases. (8)