MCKV Institute of Engineering

Paper Code: PC IT 401

Database Management System

Time Allotted: 1 Hour | *Full Marks: 30*

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Group – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *five* of the following: 5×1

i. One of the shortcomings of file system is
   a) Data availability
   b) Fixed records.
   c) Sequential records.
   d) Lack of security.

ii. DBA is a
   a) Person
   b) Software
   c) Hardware
   d) Others.

iii. DDL stands for
   a) Database define level
   b) Distributed database linkage.
   c) Data Dictionary linkage.
   d) Data Definition Language

iv. The information about data in a database is called
   a) Meta data
   b) Hyper data.
   c) Tera data
   d) None of these.

v. At what level is the data of a database stored?
   a) External or View
   b) Internal or physical
   c) Conceptual or logical
   d) All of these.

vi. The DML provides following function access to the database:
   a) Retrieve data and / or records
   b) Add (or Insert) records
   c) Delete records from database files
   d) All of these.

Group – B

(Short Answer Type Questions)

Answer any *two* of the following 2×5

3. List major functions of Database Administrator. 5

5. How could you define Scheme, Instance, DDL, DML, and Entity with a help of some example. 5

4. How many categories of database users are there in RDBMS and differentiate and explain each of them. 1+4=5

Group – C

(Long Answer Type Questions)

Answer any *one* of the following 1×15

15. What is Data Abstraction? How many different level of data abstraction are there? With the help of the diagram mentions the four main points of each of the level of abstractions. 3+2+10=15

16. What are the main advantages and disadvantages of database management system (DBMS) over a file process approach? Define Data independence .Explain the differences between physical and logical data independence. 10+1+4=15

MCKVIE/ B.Tech./IT/CT-2/2021-22/PC IT401

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Group – A

(Multiple Choice Type Questions)

1. *Choose* the correct alternatives for any ***five*** of the following: 5×1

i. The links between rows of a master table and those of a nested table are maintained using:

a) Pointers. b) Foreign keys. c) Determinants. d) Clusters.

ii. The type of the data structure that is used in relational model is

a) Table b) Tree c) Node d) None of the above.

iii. An association among two or more entities is called _____

a) Entity Type b) Relationship c) Relationship Type d) none

iv. In relational terminology, an attribute is

a) a record b) an entity c) a field d) a table

v. A tuple is also known as a(n) _____.

a) table b) relation c) row d) field

vi. A field, or a combination of fields, that has a unique value is a

a) Secondary key. b) Foreign key c) Primary key. d) Alternate key

Group – B

(Short Answer Type Questions)

Answer any *two* of the following 2×5

2. Explain the difference between weak entity set and strong entity set?
3. Write down the formal definition of Relational Algebra.
4. With an example define the concepts specialization, generalization and aggregation.

Group – C

(Long Answer Type Questions)

Answer any *one* of the following 1×15

5. Explain the terms Candidate key, Primary Key, Secondary Key, Alternate Key, and Super Key. 3X5=15
6. Describe entities, attributes, relationship and discriminator, existence dependencies. 3X5=15

MCKV Institute of Engineering

Paper Code: PC-IT401

Paper Name: Data Base Management System

Time Allotted: 1 Hour | *Full Marks: 30*

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

Group – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for any ***five*** of the following: 5×1=5

i. The language used application programs to request data from the DBMS is referred to as the
a) DML b) DDL c) query language d) none

ii. Large collection of files are called
a) Fields b) records c) database d) sectors.
c) Describes how data is actually stored on disk. d) Both (A) and (C).

iii. A relational database developer refers to a record as
a) A criteria. b) A relation.
c) A tuple. d) An attribute.

iv. Which symbol do we use in place of the except?
a) ~ b) ¬
c) v d) ^

v. In a relational model, relations are termed as
a) Tuples. b) Attributes c) Tables. d) Rows.

vi. A functional dependency is a relationship between or among:
a) Tables b) Relations c) Rows d) Attributes.

Group – B
(Short Answer Type Questions)

Answer any ***two*** of the following 2×5=10

2. Why normalization needed? Define term anomalies and functional dependency? [2+3]
[Module2/CO1/Understand /LOCQ]
3. Write Short notes on Functional Dependency. [Module5/CO2/ Remember /IOCQ] 5
4. Explain partial and transitive dependency with an example. [Module5/CO2/ Remember /IOCQ] 5

Group – C
(Long Answer Type Questions)

Answer any ***one*** of the following 1×15=15

5. Consider the following relations and write the queries in Tuple Relational Calculus (TRC) and Domain Relational Calculus (DRC).
Relations are Loan (Loan number, Branch name, Amount), Borrower (Customer name, Loan number), Depositor (Customer name, Account number)
i) Find the loan number, branch, amount of loans of greater than or equal to Rs.10000 amount?
ii) Find the loan number for each loan of an amount greater or equal to Rs.10000?
iii) Find the names of all customers who have a loan and an account at the bank? [Module3/CO1/ Evaluate /HOCQ] [3x5]
6. What are the six fundamental operations in relational algebra and explain each type with examples? [6x2.5]
[Module3/CO1/ Understand /IOCQ]

Done

MCKV Institute of Engineering

Paper Code : PC-IT401

Paper Name:Database Management System

Time Allotted: 1 Hour | *Full Marks: 30*

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

Group – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any ***five*** of the following: 5×1=5

i. DBA is a- a) Person b) Software c) Hardware d) Others.
ii. One of the shortcomings of file system is
a)Data availability b)Fixed records. c) Sequential records d) Lack of security
iii. A field, or a combination of fields, that has a unique value is a
a) Secondary key b) Foreign key c) Primary key d) Alternate key
iv. Aggregation is- a) Specialization b) Generalization c) Abstraction d) All of these.
v. Prime attributes are part of-
a) Primary domain b) multivalued domain c) Candidate key d)none of these.
vi. A tuple is also known as a (n) _____.a) table b) relation c) row d) field

Group – B

(Short Answer Type Questions)

Answer any ***two*** of the following 2×5=10

2. Define the concepts of specialization, generalization and aggregation. [CO3/Remember /LOCQ]
3. Explain the difference between weak entity set and strong entity set. [CO3/Analyze /IOCQ]
4. Explain the difference between physical & logical data independence. [CO2/ Analyze/IOCQ]

Group – C

(Long Answer Type Questions)

Answer any ***one*** of the following 1×15=15

5. a) Explain the roles of a database administrator (DBA). [CO1/ Understand /LOCQ] 5
b) Explain the terms Candidate key, Primary Key, Secondary Key, Alternate Key, and SuperKey. 2x5=10
[CO3/Understand /LOCQ]
6. a) Why we need query three level architecture of a DBMS? Justify your answer with suitable example. [CO1/ Evaluate /HOCQ] 5
b) Describe entities, attributes, relationship and discriminator, existence dependencies. 2x5=10
[CO3/ Understand /LOCQ]

MCKV Institute of Engineering

Paper Code: PC-IT401

Database Management System

Time Allotted: 3 Hours | *Full Marks:* 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Group – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any ***ten*** of the following: 10×1=10

(i) The links between rows of a master table and those of a nested table are maintained using:

a) Pointers b) Foreign keys c) Determinants d) Clusters

(ii) One of the shortcomings of file system is

a) Data availability b) Fixed records c) Sequential records d) Lack of security

(iii) DBA is a

a) Person b) Software c) Hardware d) Others

(iv) Relational calculus is a

a) Procedural language b) Non-procedural language

c) Structured query language d) None of these.

(v) In a relational data model, columns of a model are called

a) Relation b) Tuple c) Attribute d) Degree.

(vi) SELECT operation in SQL is a

a) Data query language b) Data definition language

c) Data manipulation language d) Data control language.

(vii) A normal form in which every determinant is a key is

a) 2NF b) 3NF c) 4NF d) BCNF

(viii) Which of the following makes the transaction permanent in the database?

a) View b) Rollback c) Commit d) Flashback

(ix) The project operation:

a) Combines relational tables to provide the user with more information than is otherwise available.

b) Creates a subset consisting of columns in a table.

c) Organizes elements into segments.

d) Identifies the table from which the columns will be selected.

(x) Tables with indexes allows faster searches, but slows performance on

a) Insertion b) Deletion c) Update d) Select

(xi) What type of lock forbids any other user to access the data in anyway?

a) Shared b) Exclusive c) Limited d) Concurrent

(xi) The entity integrity constraint states that

a) No primary key value can be null

b) A part of the key may be null

c) Duplicate object values are allowed

d) None of these

(xii) Prime attributes are part of

a) Primary domain b) Multi valued domain c) Candidate key d) None of these.

Group – B

(Short Answer Type Questions)

Answer any ***three*** of the following 3×5=15

2.a) List four significant differences between a file management system and a DBMS. 4+1=5

b) What is hierarchical DBMS?

3. Explain the difference between weak entity set and strong entity set? 5

4. Explain DDL, DML, DCL and TCL with suitable examples in SQL. 5

5. What is two phase locking? How does it guarantee serializability? 3+2=5

6. Discuss the entity integrity and referential integrity constraint. Why each is considered important? Explain with suitable example. 3+2=5

Group – C

(Long Answer Type Questions)

Answer any ***three*** of the following 3×15=45

7.a) Explain the roles of a database administrator (DBA).

b) Write a query for foreign key on delete cascade using alter command.

c) What is aggregation? Discuss with an example.

d) Draw a functional dependency diagram (FD diagram) that is in 3NF but not in BCNF. Decompose that FD diagram into BCNF. 5+4+3+3=15

8.a) Why we need query three level architecture of a DBMS? Justify your answer with suitable example.

b) Explain the difference between physical & logical data independence.

c) Consider relation R (A, B, C, D, E) and a set of functional dependencies

F= {A->C, B->C, C->D, DC->C, CE->A}.

Suppose the relation has been decomposed by the relations
R1(A,D) R2(A,B) R3(B,E) R4(C,D,E) R5(A,E).
Is this decomposition lossy or lossless? Justify your answer

d) Differentiate between Dense Index and Sparse Index. M(8)

3+4+6+2=15

9. a) Differentiate between Tuple Relational Calculus (TRC) and Domain Relational Calculus (DRC) M(7)

b) Consider the following relations and write the queries in Tuple Relational Calculus (TRC) and M(7)
SQL.Relations are:

Loan (Loan number,Branchname,Amount), Borrower(Customer name,Loan number),
Depositor (Customer name,Account number)

i) Find the loan number, branch, amount of loans of greater than or equal to Rs.10000 amount.

ii) Find the loan number for each loan of an amount greater or equal to Rs.10000.

iii) Find the names of all customers who have a loan and an account at the bank.

c) Explain with example derived attribute and composite attribute. M(3) (5)

3+ (3×3) +3=15

10. a) Explain conflict serializability and view serializability with proper example M(7)

b) How you can test for serializability? M(7)

c) Describe transaction life cycle with a neat diagram.

d) What do you mean by lossless and dependency preserving decomposition? M(6)

5+3+4+3=15

3×5=15

11. Write Short notes on ***any three*** of the following.

a) Basic relational operations M(3)

b) B+ tree M(8)

c) Data Dictionary ~~M(8)~~ M(

d) ER diagram M(2)

e) Time stamp based protocol.