Total No. of Questions: 05

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BTCS405

IV Semester Examination, May-June 2019

B.Tech / B.Tech + M.B.A. / B.Tech + M.Tech.
(CSE/CCE/CSE-CC/CSE-CMC/CSE-BDA/CSE-CYFS/IT)

Data Base Management System

Choice Based Credit System (CBCS)

Time: 3 Hrs.

Maximum Marks : 60

Minimum Pass Marks: 24

Note: *(1) All questions carry equal marks, out of which part 'A' and 'B' carry 3 marks and part 'C' carries 6 marks.*
(2) From each question, part 'A' and 'B' are compulsory and part 'C' has internal choice.
(3) Draw the neat diagram, wherever necessary.
(4) Assume suitable data, wherever necessary.

Q.1.(A) What is meant by DBMS? How does DBMS provide data abstraction? Explain. **03**

(B) What is meant by data independence? Explain its significance. **03**

(C) Explain the concept of a data model. What data models are used in database management systems? Explain. **06**

OR

Consider a problem and draw an ER diagram for it. In an organization several projects are undertaken. Each project can employ one or more employees. Each employee can work on one or more projects. Each project is undertaken on the requirement of client. A client can request for several projects. Each project has only one client. A project can use a number of items and an item may be used by several projects.

Q.2.(A) What is meant by integrity constraints? Explain the different types of integrity constraints. **03**

(B) What is meant by view? Write syntax to create a view. **03**

(C) Consider the following database: Book (bid, book name, author, publisher) **06**
Student (sid,student_name,department,admission_year),
Issue(sid,bid, issue_ date) ,
Write SQL statements for the following

i. List all the students whose name's second character is 'e'.
ii. List all the students who have issued the book in the month of June.
iii. List the number of students admitted in each department.
iv. List the name of student who has issue highest number of books
v. List the name of department in which admitted students are highest in year 2010.

Contd...

OR

What is Trigger? What are the types of triggers? Create a trigger on the following table Vehicle_Loan(vid,vprice,down_pay,Interest_rate,term,Interest,emi) so that the Interest and emi of loan amount is automatically inserted whenever a record is inserted in the table.

Q.3.(A) Differentiate the following 03
a) Primary index v/s secondary index
b) Sparse index v/s dense index

(B) What is query processing in DBMS? Does the data dictionary have any role to play in query processing? 03

(C) What is meant by file organization? What are the types of the file organization? Explain. 06

OR

What is meant by indexing? Mention the purpose of indexing. How it can be done by B+ tree?

Q.4.(A) What is transaction and explain its properties? 03

(B) Explain two phase locking with an example. 03

(C) Consider the universal relation
R = {A, B, C, D, E, F, G, H, I} and the set of functional dependencies
F = {(A, B)}→{C}, {A} →{D, E} 06
{B} →{F}, {F} → {G, H},
{D} → {I, J} what is the key for R?
Decompose R into 2 NF, then 3 NF relations.

OR

What is Relational Algebra? Assume the following relations
Book(bid, title, publisher, year)
Student(sid, sname, branch, age)
Author(aid, aname, address)
Borrow(bid,sid,date)
Written(bid,aid)
Write the relational algebra expression for the following statements
a) List all books publish by McGraw-Hill before 1990
b) List the name of the students who are older than 23 and who are not studying in ME branch
c) List the names of all students who have borrowed a book and who are in IT branch
d) Find the name of the youngest student
e) List the authors of the books the student 'Rajesh' has borrowed.
f) Insert a new record in student relation and delete a record from book relation

Q.5.(A) What is meant by PCB mask in IMS? Explain.

(B) Explain the importance of database security. How do you provide database security? Explain. 03

(C) Explain object oriented database. What are the advantages of object oriented database over relational database? Explain. 03

OR 06

Explain XML database. Give XML representation of bank management system. Explain document type definition and XML schema.

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BTCS405

IV Semester Examination, December 2018

B.Tech. / B.Tech. + M.Tech. / B.Tech. + MBA [CCE/CSE-CMC/BDA/CYFS/IT]

Database Management System

Choice Based Credit System (CBCS)

Duration: 3 Hrs.

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Note: (1) All questions carry equal marks, out of which part 'A' and 'B' carry 3 marks and part 'C' carries 6 marks.

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(3) Draw neat diagram, wherever necessary.

(4) Assume suitable data, wherever necessary.

Q.1.(A) Explain the following :

(1) Difference between Network, Hierarchical and Relational Data Model

(2) Schema vs Instance

(3) Meta Data & Data Dictionary or Distribution Transparency. 03

(B) Explain the advantages of DBMS over File Organization System. 03

(C) Draw an EER diagram for the following Program: A non-profit Organization depends on a no of different types of persons for its successful operations the organization is interested in the following attributes for all of these Persons: SSN, NAME, ADDRESS, CITY / STATE / ZIP and Telephone. Three types of Persons are of greatest interest: employees, volunteers and donors. Employees only have a Date_Hired attribute and volunteers only have a skill attribute. Donors only have a relationship (named donates) with an Item entity type, A donor must have donated one or more items & an item may have no donors or one or more donors. There are Persons other than employees, volunteers & donors who are of interest to the organization so that a person need not belong to any of these three groups on the other hand, at a given time a person may belong to two or more of these groups (for ex. Employee & donor). 06

OR

A bank has 3 types of accounts Checking, Savings and Loan Following are the attributes for each type of account:

Contd.....

CHECKING: ACCT_NO, Date_Opened, Balance, Service _Charge.
SAVINGS: Acct_No, Date_Opened, Balance,I nterest _Rate.
LOAN: Acct_No, Date_Opened, Balance, Interest_Rate, Payment.
Assume that each bank account must be a member of exactly one of these subtypes using generalization, develop an EER Model segment to represent this situation. Remember to include subtype discriminator?

Q.2.(A) Write the equivalent SQL for the following, (Assume the required Relation/Schema (if needed)

1. To retrieve the details of all the employes from EMPLOYEE table whose salary is greater than the salary of employee "PRAVEEN", and whose name starts with the letter "S" and works in Management Department.
2. To Retrieve the details of all the person from "PERSON" table ,in the group of projects on which they are working ,and whose salary is greater than maximum salary of person "shashank", within the group only the details of those persons should appear whose maximum working hours is more than 12 Hours.(ONLY one Table is there "PERSON)
3. To display the name and salary of top three earners from EMPLOYEE table. 03

(B) Why we need to convert a SQL statement in RA? Write the equivalent RA expressions for the following query:
SELECT d.dept_id,e.max (sal),e.eid FROM Dept D,Emp E Where e.eid=d. dept-id group by (d.dept_id,e.e_id) having min (sal) > 55000, 03

(C) Explain the difference between following with a suitable example:

(1) TRC & DRC
(2) Natural & Inner Join
(3) Intension and Extension
(4) System R
(5) Dual Table in Oracle
(6) Table space & Redo-log Files 06

OR

How does a query tree represent a RA expression? What is mean by an execution of a query tree? Discuss the cost based and heuristics query optimization.

Q.3.(A) Discuss the techniques for allowing a hash file to expand and shrink dynamically. What are the advantages and disadvantages of each?

(B) How does B- to a tree differ from a B+- tree? Why is a B+ -tree usually preferred as an access structure data file? 03

(C) What are the differences between Primary, Secondary, & clustered indexes? How these differences do affects the ways in which these indexes are implemented? Which of these indexes are dense and which are not? 03

OR

Define Main goals of RAID technology. How does it achieve them? How does disk Mirroring help improve reliability? Explain with an Example. 06

Contd.....

.4.(A) Discuss th
ordering d
(B) Define ser
(C) GRADE_R

Student_ Id	
16830 0458	
26830 0458	
54329 1073	
54329 1073	
54329 1073	

Table shows
suitable exa
REPORT:
Student_ID
Course_ID
Student _ID,
Instructor_N
Draw a relat
Normal Form
relations, Dr
constraints.

Consider the
CAR_SALE
Assume that
Primary key
Date_sold
Based on the
would you su

Q.5.(A) Write short n
(1) IMS Archi
(B) Explain Secu
(C) Explain the D
discuss?

Explain the c
discuss?

Q.4.(A) Discuss the timestamp ordering protocol for concurrency control. How does strict time stamp ordering differ from basic time stamp ordering? **03**

(B) Define serial schedule and serializable schedule with suitable condition. **03**

(C) GRADE_REPORT Relation

Student_ Id	Student_ Name	Campus-Add	Major	Course_ Id	Course_ Title	Instructor_ Name	Instructor_ Location	Grade
16830 0458	Williams	208 Brooks	IS	IS350	DBMS	Codd	B 104	A
26830 0458	Williams	208 Brooks	IS	IS465	System Analysis	Parsons	B 37	B
54329 1073	Baker	104 Philips	Acctg	IS350	DBMS	Codd	B 104	C
54329 1073	Baker	104 Philips	Acctg	Acct201	Account ing	Miller	H310	B
54329 1073	Baker	104 Philips	Acctg	Mktg 300	Intro Mktg	Bennett	B212	A

Table shows a relation called Grade_Report for a university the iterator methods with a suitable example. Following is a description of the functional dependencies in GRADE REPORT:

Student_ID ⟶ Student_Name, Campus_Address, Major

Course_ID ⟶ Course_Title, Instructor_Name, Instructor_Location

Student _ID,Course_ID ⟶ Grade

Instructor_Name ⟶ Instructor_Location

Draw a relational Schema and diagram that shows the FDs in the given Schema, In what Normal Form this schema, is it Relation? Decompose GRADE REPORT into a set of 3NF relations, Draw a relational schema for 3NF relations and show the referential integrity constraints. **06**

OR

Consider the following relation:

CAR_SALE (Car #, Date_sold, Salesman# , Commission%, Discount_amt)

Assume that a car may be sold by multiple salesmen and hence {Car #, Sales-man#} is the Primary key ,Additional dependencies are:

Date_sold ⟶ Discount_amt and Salesman# ⟶ Commission%.

Based on the given primary key, is this relation in 1NF, 2NF, or 3NF? Why or Why not? How would you successively normalize it completely?

Q.5.(A) Write short notes on the following :

(1) IMS Architecture (2) PCB (3) DL/I Or XML. **03**

(B) Explain Security and Integrity violations. **03**

(C) Explain the Data Mining and Data warehouse, how Data warehouse differs from Database discuss? **06**

OR

Explain the concept of Distributed database. Why need to use object oriented database discuss?

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BTCS405

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Database Management System

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Q.1.(A) Justify the statement with example – "Database Management System are better than file processing Approach". **03**

(B) Describe the architecture of database system. **03**

(C) Describe the terms Entity and Relationship in E-R model. Draw and explain ER model for database design of an university system. **06**

OR

Variety of data models can be used for data base design. Explain prominent models with example.

Q.2.(A) Distinguish and describe various data constraints in MYSQL. **03**

(B) Explain various DDL and DML commands in structured query language. **03**

(C) Schema defined for employee management system is:-
Employee:- EmpID, Name, Address, Department, Designation, Salary.
Department:- Dept ID, Name, HeadID.
Write SQL Queries for the following and show the results:-

a) Retrieve the details of employees who gets the maximum salary.
b) List names of all employees who earn more than R. 100000 in a year.
c) Give the name of the employee who heads the department where employee with EMPID3 works. **06**

OR

Consider the following table:-
Employee (EMP_Name, Dept_Name, Salary)
Write SQL statements for the following:-

a) Find the department which has the highest average salary.
b) Find all departments where more than 60 employees are working.
c) Find the name of employees whom salary are higher than the average salary of department.

Contd.....

Q.3.(A) Describe the basics steps involved in query processing. 03

(B) Explain as how records of file are placed and organized into a file in secondary storage. 03

(C) Define hashing. Consider the keys 20, 15, 12, 2, 3, 8, 5 and 19 are inserted into an initially empty hash table of length 10 using open addressing with hashfunction h(k) = k mod 10 and linear probing. What is the resultant hash table? 06

OR

Define B-TREE .Construct B+ Tree to insert the following key values(order of 3).

32, 11, 15, 13, 22, 15, 44, 67, 4

Q.4.(A) Describe transactions and ACID properties of transactions briefly. 03

(B) Discuss : (a) Lock based protocol (b) Time stamp protocol 03

(C) Define normalization. Explain 1NF, 2NF, 3NF and BCNF with suitable examples. 06

OR

Define lossless and lossy decomposition. Consider relation R(A, B, C, D, E) and find out the candidate key and highest normal form .

A B-> CD

CD -> EF

D -> B

BC -> DEF

CE -> F

Q.5.(A) Explain the architecture of Information Management System in brief. 03

(B) Write short notes on **(Any two)**:

a. Object Oriented Database

b. Program Communication Block

c. Data Warehousing

(C) Describe the steps involved in data mining process. 03

OR 06

Describe Distributed Database. Differentiate between a homogenous distributed database and heterogeneous distributed database.

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