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Exam Roll No. 05290302012

# END TERM EXAMINATION

SECOND SEMESTER [BCA] MAY-JUNE-2013

**Paper Code: BCA110** **Subject: Database Management System (New)**

**Time : 3 Hours** **Maximum Marks :75**

**Note: Attempt any five questions including Q.no.1 which is compulsory. Select one question from each unit.**

Q1. a. Differentiate between physical and logical data independence.
b. Define strong and weak entity.
c. Define primary key and candidate key.
d. Define entity integrity and referential integrity constraint
e. Define domain constraint and union compatible.
f. Define update and insertion anomalies.
g. Define starvation and time stamp.
h. Define Schedule and serialisability.
i. Define binary locking and multiple locking.
j. Write syntax of UPDATE and INSERT command. 2.5*10

## Unit I

Q2. a. Design and explain the E-R diagram of college database with following consideration also indicate the relationship cardinality. 8
i. College keeps the track of students, faculties, departments and courses organized by various departments.
ii. College contains various departments and each department is assigned a unique id and name. Some faculty members are also appointed to each department and one of them acts as head of department.
iii. A number of courses are conducted by each department and each course is assigned a unique id, name and duration.
iv. Faculty information contains id, name, address, basic salary and phone. A faculty member is assigned to only one department but can teach various course of other departments
v. Student's information contains roll number (Unique), name, address, marks and age. A student can opt one course only.
vi. Guardian information is also kept along with each student, which keeps guardian name, age, address and phone.

b. Explain sub class, super class, generalization and specialization with example. 4.5

Q3. a. Discuss three tier architecture of database management system in detail. Explain each term used in the architecture. Write its advantages. 8
b. What are the drawbacks of file management system explain them? 4.5

## Unit II

Q4. a. Consider the following table
client(client_no, name, city, pin_code, state, bal_due)
product(product_no, description, unit, sell_price, codt_price)
salesman(salesman_no, name, city, pin_code,sal_amt, tgt_to_get, yet_sal)
Write SQL for each of following:
i. Create the above tables. 3
ii. List all sales man who are located in Bombay and have salary equal to 20000. 1
iii. Change bal_due of client_no C01 to 1000. 1
iv. Add a column telephone of data type number and size 10 to client 1
v. Change size of sel_price to (10,2) 1
vi. Change name of salesman to s_man. 1

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b. Explain aggregate functions with example. 4.5

Q5. a. Explain LIKE, GROUP BY, ORDER BY AND HAVING clause with example. 8
b. Explain numeric functions with example. 4.5

**Unit III**

Q6. a. What is normalization? Explain in detail 1NF, 2NF and 3NF with example of each. 8
b. What is functional dependency? Explain trivial and non trivial dependency. 4.5

Q7. a. What are basic set operations? Explain with example. 8
b. Write the steps to convert E-R model to Relational model. 4.5

**Unit IV**

Q8. a. What is a transaction? Explain ACID properties. 8
b. What do you mean by concurrent transaction? Explain the problems of concurrent transaction. 4.5

Q9. a. What is deadlock? Explain the wait – die and wound – wait scheme for deadlock prevention. 8
b. What is locking? Explain 2 - Phase Locking. 4.5

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# END TERM EXAMINATION

## SECOND SEMESTER [BCA] MAY-JUNE 2014

**Paper Code: BCA-110** **Subject: Database Management System (2011 Onwards)**

**Time: 3 Hours** **Maximum Marks: 75**

**Note: Attempt any five question, including Q.no.1 which is compulsory. Select one question from each Unit.**

Q1 Describe any five of the following:- **(5x5=25)**

(a) Differentiate between strong and weak entity.
(b) Types of relationships in E-R-Diagram.
(c) ACID properties for a transaction.
(d) Selection and projection operation in relationship algebra.
(e) Deadlock.
(f) Normalization
(g) Aggregate functions in SQL.

### Unit-I

Q2 (a) Explain data independence. What is the difference between logical and physical data independence. **(6.5)**

(b) Define database management system. What are the advantages of a DBMS? **(6)**

Q3 (a) What are various types of attributes? Explain with an example. Also draw the diagram. **(6.5)**

(b) What is DDL and DML, explain with an example. **(6)**

### Unit-II

Q4 Consider the following tables:-

**STUDENT**

| Rollno | Student Name | Shift | Contact No. |
|---|---|---|---|
| 1 | Vinay | M | 9155 |
| 2 | Rima | E | 8734 |
| 3 | Mini | E | 4523 |
| 4 | Avi | M | 5677 |

**RESULT**

| Rollno | Maths | POM | DE | DS | DBMS |
|---|---|---|---|---|---|
| 1 | 56 | 65 | 53 | 55 | 59 |
| 2 | 72 | 69 | 74 | 77 | 76 |
| 4 | 83 | 78 | 86 | 88 | 89 |

Write queries for the following:-

(a) Add result of student Mini assuming your own data. **(1.5)**
(b) Change the shift of student 'Avi' to 'E' and contact no as 2987. **(1.5)**
(c) Remove the Result of student 'Rima'. **(1.5)**

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BCA-110 (2011)

(d) Display the result of all students with their roll no, name and shift. **(1.5)**
(e) Show those students' name in alphabetical order with their result who scored better marks in DBMS than DS. **(1.5)**
(f) List the names of all those students who have lowest marks in DBMS. **(1.5)**
(g) Show the result of Vinay in all the subjects. **(1.5)**
(h) List the names of all those students who have above the average of marks in Math. **(2)**

Q5 (a) Describe various integrity constraints which can be implemented on a database. **(6.5)**
(b) Give purpose, syntax and example of following:- **(3x2=6)**
(i) ALTER TABLE (ii) DROP TABLE (iii) CREATE VIEW.

## Unit-III

Q6 Consider the following two tables $T_1$ and $T_2$. Show the result of following operations:-

Table $T_1$

| P | Q | R |
|---|---|---|
| 10 | a | 5 |
| 15 | b | 8 |
| 25 | a | 6 |

Table $T_2$

| A | B | C |
|---|---|---|
| 10 | b | 6 |
| 25 | c | 3 |
| 10 | a | 5 |

a. $T_1 \triangleright\!\!\triangleleft_{T1.P=T2.A} T_2$ (2)
b. $T_1 \bowtie_{T1.Q=T2.B} T_2$ (2)
c. $T_1 \bowtie_{T1.R=T2.C} T_2$ (2)
d. $T_1 \bowtie_{T1.\ R=T2.C} T_2$ (2.5)
e. $T_1 \cup T_2$ (2)
f. $T_1 \cap T_2$ (2)

Q7 (a) Describe the steps to convert the basis ER model to Relational database schema. **(6.5)**
(b) Describe various joins in relational algebra with example. **(6)**

## Unit-IV

Q8 What is Concurrency Transaction? What are the various techniques to control the problems due to concurrency of transaction? **(12.5)**

Q9 Describe the following terms in database management system:-
(a) System Failure. **(3.5)**
(b) Backup. **(3)**
(c) Recovery. **(3)**
(d) Authorization. **(3)**

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# END TERM EXAMINATION

**SECOND SEMESTER [BCA] MAY- JUNE 2015**

***Paper Code: BCA-110*** ***Subject: Database management systems (Batch 2011 onwards)***

***Time: 3 Hours*** ***Maximum Marks: 75***

***Note: Attempt any five questions including Q.no.1 which is compulsory. Select one question from each unit.***

Q1 **(2.5x10=25)**

(a) What is timestamp based protocol?
(b) Distinguish between non-serializable and serializable schedules.
(c) Define the concept of minimal cover
(d) Discuss the ACID properties of a transaction.
(e) What is the loss-less join decomposition?
(f) What do you understand by DCL commands?
(g) How is a weak entity set different from a strong entity set?
(h) Write the syntax of selection and projection operations in relational algebra.
(i) Differentiate between equi join and natural join.
(j) When is a query called relationally complete?



## UNIT-I

Q2 Draw an ER diagram for The Book Club. It has members to whom the books are sold. The books are made available at different places in the city-called Book Club Chapter-to make it easy to members. The books are identifies by a book_id, the author and the publisher. An author can write more than one book and a book can have more than one author. Members have information such as Membership_id, Name, Phone# and status. A member can place more than one order. Choose additional attributes for the schema that seems appropriate. Mention any assumptions you make. Show minimum and maximum cardinality ratios based on the assumptions. **(12.5)**

Q3 Consider the following MAILORDER relational schema describing the data for a mail order company.
PARTS(Pno, Pname, Qoh, Price, Olevel)
CUSTOMERS(Cno, Cname, Street, Zip, Phone)
EMPLOYEES(Eno, Ename, Zip, HireDate)
ZIP_CODES(Zip, city)
ORDERS(Ono,Cno,Eno, received, Shipped)
ODETAILS(Ono, Pno,Qty)
The attribute names are self-explanatory:Qoh stands for *quantity on hand*. Specify the following queries using Relational Algebra:
(a) List the name of parts that costs less than Rs. 200
(b) List the name and cities of employees who have taken orders for parts costing more than Rs.500
(c) List the name of customers who have ordered parts from employees living in Mumbai
(d) List the name of customers who have placed exactly two orders **(12.5)**

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**UNIT-II**

Q4 (a) What is the purpose of integrity constrain in SQL? **(5.5)**
(b) What is the difference between WHERE and HAVING clause? **(4)**
(c) differentiate between Outer and Inner Join operations? **(3)**

Q5 (a) Define BCNF. How is different from 3NF? Present an example of a relation in 3NF that is not in BCNF. **(8)**
(b) A table R has attributes A,B,C,D,E and satisfies the following functional dependencies: **(4.5)**

$A \rightarrow BC$
$B \rightarrow D$
$CD \rightarrow E$
$E \rightarrow A$

(i) What are the candidate keys?
(ii) Is this table in 2NF/3NF/BCNF?



**UNIT-III**

Q6 (a) What is a concurrent transition?What are the problems associated with concurrency? **(5)**
(b) What is a two-phase locking protocol? How does it guarantee serializability? **(7.5)**

Q7 (a) What is a timestamp? How does the system generate timestamps? **(6)**
(b)What are the rules followed to ensure serializibility in multiversion techniques based on timestamp ordering? **(6.5)**

**UNIT-IV**

Q8 (a) What is a deadlock? How are deadlocks handled? What is deadlock prevention and how is it different from deadlock detection and deadlock recovery? **(12.5)**

Q9 (a) Writes notes on the following:
(b) Checkpoints **(4)**
(c) Triggers and Assertions **(4)**
(d) EER Model **(4.5)**

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# END TERM EXAMINATION

SECOND SEMESTER [BCA] MAY 2018

**Paper Code: BCA 110** **Subject: Database Management System**

**Time : 3 Hours** **Maximum Marks :75**

**Note: Attempt any five questions including Q. No.1 which is compulsory.**

Q1. Answer the following: **(5x5=25)**

a) Draw and explain the architecture of DBMS. Compare it with file system.
b) Explain the role of E-R model in database design.
c) How can the two tables be joined using left outer and right outer joins?
d) What problems are encountered if data is not stored in normalized table?
e) List the problems associated with two phase locking protocol.

Q2. a) Discuss the advantages and disadvantages of DBMS. **(6.5)**
b) Why is relation database approach better than earlier methods? **(6)**

Q3. a) Construct an E-R diagram for a hospital management system with a set of doctors and a set of patients. With each patient, a series of various tests and examinations are conducted. On the basis of preliminary report patients are admitted to a particular specialty ward. **(6)**
b) Construct appropriate tables for the above E-R diagram. **(6.5)**

Q4. a) Explain the differences among external, internal and conceptual schemas. **(4.5)**
b) Related with database, explain the following terms: **(8)**
i) Data integrity ii) Concurrency iii) Data independence
iv) Referential integrity

Q5. Consider the following relational schema: **(2.5x5=12.5)**
Emp (empno, ename, job, sal, comm., hiredate, deptno)
Dept (deptno, dname, location )

Give an expression in SQL for the following Queries:
a) Find the names of employees who work in deptno 10 and 20.
b) Increase the salary by Rs 1500 for the employees who are 'CLERK'.
c) Display the details of employees who work in same deptno as of the employee 'SMITH'.
d) Create the table Dept.
e) Display total salary of employees of each deptno and display those deptno whose total salary is more than Rs. 30000.

Q6. Differentiate between: **(2.5x5=12.5)**
a) Primary Key and Foreign Key
b) View and Indexes
c) Serializable and non serializable transactions
d) 2NF and 3CNF
e) Data and Metadata

Q7. a) Explain the CODD's rules of RDBMS. **(6)**
b) Discuss the timestamp ordering techniques for concurrency control. **(6.5)**

Q8. a) Discuss the different types of transaction failures that may occur in database environment. **(5)**
b) What is checkpoint? Explain the different recovery techniques when database crashes. **(7.5)**

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# END TERM EXAMINATION

SECOND SEMESTER [BCA] MAY 2019

**Paper Code: BCA-110** **Subject: Database Management System**

**Time: 3 Hours** **Maximum Marks: 75**

***Note: Attempt any five questions including Q.no.1 which is compulsory. Select one question from each unit.***

Q1 Answer the following **(any five)**:- **(5x5=25)**

(a) Explain advantage of database management system over file processing system.

(b) Explain sub class, super class, Specialization and Generalization with example and appropriate diagram.

(c) Explain DDL, DML. Give three sql commands each for DDL and DML.

(d) What do you mean by relationship cardinality? Explain its type with suitable example

(e) What do you mean by data constrain? Define Domain Constraint, Entity integrity constraint, Referential integrity constraint.

(f) Explain ACID properties of Transaction in DBMS.

(g) Draw an ER diagram for library management system. Make assumptions as required.



## UNIT-I

Q2 (a) Explain different types of attributes with example-composite, derived, multi-valued. **(6)**

(b) Discuss three tier architecture of database management system with diagram. **(6.5)**

Q3 (a) Explain different types of keys with example. Differentiate between super key, candidate key, primary key and foreign key. **(6)**

(b) Explain physical and logical data independence with diagram. **(6.5)**

## UNIT-II

Q4 (a) Consider the following relations **(10)**

Customer {CustId, CusName, Address, State}
Parts {Partnum, Description, Price}
Order {OrderNo, Name, Partnum, Qty, CustId}
Write Relational Algebra query for each of the following

- Find all customers who have placed order for part description "Tyres".
- Find customer name, address of customers who have purchased partnum 10 and quantity ordered is more than 100.
- Find customer name, address of those customer residing in State="Delhi".
- Find all order no, name, partnum of all orders placed by customer id=101.
- Find all customer name who have placed order for product with price more than 500.

(b) Explain views in DBMS with example. **(2.5)**

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Q5 (a) Construct ER diagram for Company Management System. Assuming Company Works on different projects, for each project working hours is maintained for each employee and company has many departments located at different places. Explain each relationship in terms of cardinality, participation and describe each entity with its attributes. **(10)**

(b) Explain indexes in DBMS and its advantage. **(2.5)**

**UNIT-III**

Q6 Consider the following relations **(12.5)**

Stu{SID integer PK, Sname varchar, course varchar, sem integer}
Stu_Project{SID integer FK, PID integer, progress integer, PK(SID,PID)}
where PK-Primary Key, FK-Foreign Key
Write SQL query for each of the following.

- Create both table with constraints
- Add new column ProjectName varchar2(20) in Stu_Project.
- Find all student name who have made progress more than 40% in their project.
- Delete record form Stu_project where progress in less than 10%.
- Increase the progress by 10% for each student of BCA course.
- Create view SV having Sname, course, PID, progress.



Q7 (a) Explain functional dependency by taking the example of Stu_Project mentioned in Q6. **(6)**

(b) Explain 1st, 2nd and 3rd Normal form with example. **(6.5)**

**UNIT-IV**

Q8 (a) Define concurrency. Explain the problem of lost update, dirty read and incorrect summary with example. **(6)**

(b) Explain Discretionary Access Control [Grant/Revoke] method for database security. **(6.5)**

Q9 (a) Explain 2 Phase Locking Scheme for data recovery. How two phase locking helps in maintaining integrity of the database? **(6)**

(b) Explain Different types of security issues and threats to database system. **(6.5)**

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P2