

Mid-Semester Examination
 School of Computer Engineering
 KIIT University, Bhubaneswar-24

Time: 2hrs**Full Mark: 50**

Answer any FIVE questions, including Question No. 1 which is compulsory.

1. Briefly answer the following bits. [2x5]
 - a. Differentiate between logical data independence and physical data independence.
 - b. List out the tasks of query processor in database architecture.
 - c. Convert the following SQL query into Relational Algebra
SELECT ename , eno, phno, city from EMPLOYEE where eno=5001 AND dno=32;
 - d. Let E1 & E2 be two entities in an ER diagram with simple single valued attributes. R1 & R2 are two relationship between E1 & E2, where R1 is one-to-many and R2 is many-to-many. R1 & R2 do not have their own attributes. How many minimum numbers of table are required to represent this situation in the relational model. Justify your answer.
 - e. ***“Primary key is a candidate key”*** – justify your answer with suitable example.

2.

Consider the following Hospital management system.

[5+3+2]

“The database maintain all the details of the doctor (Name, Designation, Specialization) who are enrolled to Department and also all employee information who works for the department. Department of the hospital identified through the Deptno, and Department name. There is a registration process required for all patient to a department before they treated by any doctor. Patient detailed information must contains their name, address, age. The database also keeps track the payment details of the patient once the patient discharged from the hospital. If the patient having any insurance policy (policyno, type, Company) then that information also stored into the database.”

- a. Draw the ER diagram of the above problem description.
 - b. Convert the ER diagram into relations.
 - c. Identify the primary key and foreign key(s), if any.
3.
 - a. Discuss the types of Relational constraints with suitable example.[5]
 - b. Discuss the advantages of DBMS over traditional file systems.[5]

4. *Solve the following queries using the relational algebra:* [2x5]
 CUSTOMER (cust_num, cust_name, street, city)
 DEPOSIT (acc_num, cust_num, balance, branch_name)
 LOAN (loan_num, cust_num, loan_amt, branch_name)
- Find the loan details of the customers who has taken a loan more than Rs. 10,000 from 'SBI, BBSR' branch.
 - Display the account number and customer number who are having balance not more than Rs. 50,000.
 - Display the customer number as cno and customer name as cname of the customers belong to Rourkela.
 - Display the customer number who is having an account balance less than 20,000 but not having a loan.
 - Find out the customer name, loan number and branch name who are having a loan at 'SBI, BBSR'.
5. *Solve the following queries using SQL:* [2x5]
 Borrower (id_no, name)
 Book (book_no, title, author, borrower_id_no)
- Write SQL statements to create the given tables along with necessary key constraints. Also ensure that name of the borrower and title of the book cannot be null.
 - Add a borrower entity with id_no = 1005 and name = Amit. Then issue a book with book_id = 2054 to him by adding a record in the Book table.
 - Modify the borrower table by adding a new column titled “books_issued” which can store the number of books issued to any borrower.
 - Update the number of books issued to Amit in the newly-added column.
 - The book has been returned by Amit. Remove the corresponding issued record from the Book table
6. *Write Short notes (any two):* [5x2]
- Generalization and Specialization.
 - 3-Level data abstraction.
 - Data model

~~~~ALL THE BEST~~~~