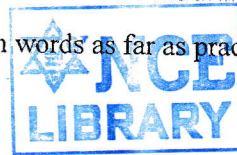


TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2080 Baishakh

Exam.	Back	
Level	BE	Full Marks 80
Programme	BEI	Pass Marks 32
Year / Part	III / I	Time 3 hrs.

Subject: - Data Base Management Systems (CT 610)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ The figures in the margin indicate Full Marks.
- ✓ Assume suitable data if necessary.



1. Distinguish between logical and physical data independence. Define DDL, DML and DCL with examples. [2+3]
2. What is keys and explain different types of keys. "A football club has a name and a ground and is made up of players. A player can play for only one club and a manager, represented by his name manages a club. A footballer has a registration number, name and age. A club manager also buys players. Each club plays against each other club in the league and matches have a date, venue and score." Create an ER diagram for above scenario. [2+8]
3. Consider the following insurance database.
PERSON (lisenceNO, name, address)
CAR (modelNo, brand, year)
ACCIDENT (reportNo, date, location)
OWNS (lisenceNo, modelNo)
PARTICIPATED (lisenceNo, reportNo, damage Amount)
 - a) Write relational algebra expression for the given queries:
 - (i) Find the Person name and car he/she owns and the car was manufactured on 2010.
 - (ii) Find the total number of accidents occurred on jan 20, 2022 location wise.
 - (iii) Find the details of accident where the damage amount exceeds 50000.
 - (iv) Find name of all person who met an accident. [4×2]
 - b) Write SQL expression for the given queries:
 - (i) Find the Person detail whose name starts with 'A' and is involved in some accident.
 - (ii) Find the car details that are involved in accident and calculated more than 40000 as a damage amount.
 - (iii) Delete the information of car which is owned by person living in Humla.
 - (iv) Create a view named PERSON_REPORT which contains lisenceNO, name and reportNo as its member and the person's address is Ktm. [4×2]
4. a) Define integrity constraints and domain constraints. [4]
b) What is normalization? Explain the role of function dependency in normalization of data. [2+2]
5. Define query processing with necessary figure. Explain the differences between cost-based and heuristics based methods of query optimization. [3+5]
6. a) What is the difference between ordered indices and hash indices in a database? What is the advantages of using sparse index? [4]
b) What do you mean by RAID? Explain the types of RAID and mention how to select an appropriate level of RAID. [4]

7. a) Database-system implementers have paid much more attention to the ACID properties than have file-system implementers. Why might this be the cases? [4]
- b) Briefly explain two phase locking protocol with an example. [4]
8. a) Explain the purpose of the checkpoint mechanism. How often should checkpoints be performed? [4]
- b) What is deferred-database modification technique in context to log based recovery approach? Explain. [4]
9. Differentiate between data warehousing and data mining with an example. What are the types of data fragmentation in distributed databases? Write any four advantages of distributed database. [3+3+3]

Exam.	Regular		
Level	BE	Full Marks	80
Programme	BEI	Pass Marks	32
Year / Part	III / I	Time	3 hrs.

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1. What are the advantages of Database Management System? List roles and responsibilities of Database Administrator. [3+2]
2. a) Design an E-R diagram for a company human resource database, "The Company has a set of branch offices. Each branch office has a set of departments. Each department has a set of employees, a set of projects. Each employee has a job history, academic qualification. For each job type, the employee also has a salary history." [7]
 - b) What is key attribute? List out the types of keys and explain them briefly. [3]
3. a) Consider the following relational database model: [4×2]

Product (product_id, pname, price, pdescription)
Customer (customer_id, cname, address, phone)
Purchase (product_id, customer_id, quantity, sales_mid)
Salesman (sales_mid, sname, salary)

Write SQL statement for the following:

 - (i) Create table Purchase (use foreign key)
 - (ii) List name and address of all customers who purchased the product SSD
 - (iii) Find the name of the product which purchase quantity is maximum
 - (iv) Increase the salary of all salesman by 5% who have sold at least 10 SSD
- b) For the relational database model given in the Question No. 3(a). Write relational algebraic expression for the following: [4×2]
 - (i) Display name of the customers who are from Kathmandu and name start with 'R'.
 - (ii) List the name of the product purchased by customer 'Sita' from the salesman 'Ram'
 - (iii) Find the product wise total purchased quantity
 - (iv) Update the price of all products by 8%
4. What is Normalization? Why is it important? How can you convert a Unnormalized table to Third Normal Form? Explain with example. [1+2+5]
5. Explain the steps of query processing with examples. Compare cost based evaluation and heuristic optimization method. [4+4]
6. What is record organization? Explain the way of file organization. Compare secondary index and multilevel indexing techniques. [2+2+4]
7. Define transaction and explain its ACID properties. Define schedule and give proper examples. What is a serializable schedule? [1+3+2+2]
8. Define checkpointing with example. How REDO and UNDO operations performed in log based recovery mechanism? [3+5]
9. Write short notes on: [3×3]
 - a) Advantages of object oriented database model
 - b) Parallel database architecture
 - c) Data warehousing