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 aigebra 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 occured 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) Creat 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]

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2079 Bhadra

Exam.	Regular		
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.*
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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

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