BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: BE   SEMESTER : IV
BRANCH: CSE   SESSION : SP/19

SUBJECT : CS4205 DATABASE MANAGEMENT SYSTEM

TIME: 3 Hours   FULL MARKS: 60

INSTRUCTIONS:
1. The question paper contains 7 questions each of 12 marks and total 84 marks.
2. Candidates may attempt any 5 questions maximum of 60 marks.
3. The missing data, if any, may be assumed suitably.
4. **Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a)   What is data independence? Explain the difference between logical and physical data independence.   [2]
Q.1(b)   Discuss the functions of various query processor components of a DBMS.   [4]
Q.1(c)   How an ER diagram is reduced to table? Explain with example.   [6]

Q.2(a)   Give the formal definition of TRC.   [2]
Q.2(b)   Consider the following two relations: [4]
         Loan: branch_name, loan_no, amount
         Borrower: customer_name, loan_no
         Depositor: customer_name, account_no.
         Write queries in TRC for following:
              (i)   Find branch_name, loan_no and amount for loans over 5000. **(use loan relation)**
              (ii)   Find the loan_no of each loan of an amount greater than 5000. **(use loan relation)**
              (iii)   Find the name of all customers who have a loan at Ranchi branch. **(use loan and borrower
                       relation)**
Q.2(c)   Explain the following operations with suitable example in Relational algebra – Cartesian product,   [6]
         Rename, Update, Intersect, union, Division.

Q.3(a)   What is derived relation?   [2]
Q.3(b)   What is a cursor? Why and how it is used in embedded SQL?   [4]
Q.3(c)   What are integrity constraints. How do we impose them and what are its types? Explain with example. [6]

Q.4(a)   Why are different types of anomalies that may be present in any database?   [2]
Q.4(b)   What is functional dependency? Discuss its types.   [4]
Q.4(c)   Explain 3NF and 4NF.   [6]

Q.5(a)   What is bucket overflow?   [2]
Q.5(b)   Explain and differentiate a clustering index and a secondary index.   [4]
Q.5(c)   Explain the distinction between closed and open hashing. Discuss the relative merits of each techniques [6]
         in database applications.

Q.6(a)   What is parsing and translation?   [2]
Q.6(b)   What do you mean by Selection operation using file scans and indices in query processing? Explain   [4]
Q.6(c)   Discuss external Sort-Merge algorithm.   [6]

Q.7(a)   What is cascadeless schedule?   [2]
Q.7(b)   What is two-phase locking protocol? Explain some variations of two-phase locking protocol. How does [4]
         two-phase locking protocol guarantee serializability?
Q.7(c)   What is serializability? Explain view serializability.   [6]

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