

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION SP/2024)

CLASS: IMSc
BRANCH: MATHS & COMP.

SEMESTER : VI
SESSION : SP/2024

SUBJECT: CS301 DATABASE MANAGEMENT SYSTEM

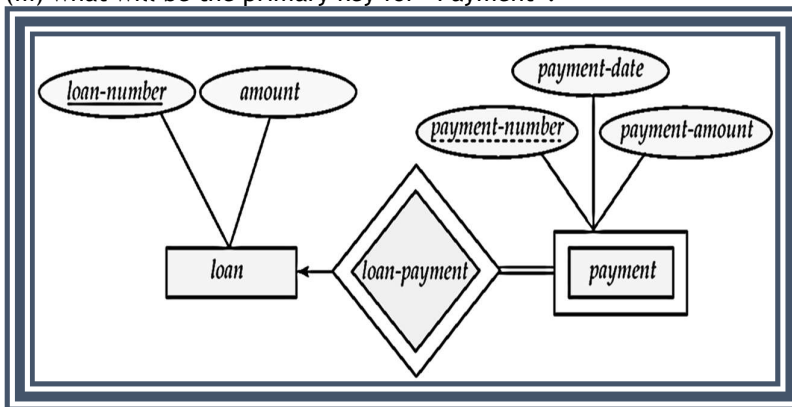
TIME: 02 Hours

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates

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|---|-----|----|----|
| Q.1(a) Differentiate Instance and Schema with suitable example. | [2] | 1 | 3 |
| Q.1(b) Draw and explain briefly the components of Database system architecture | [3] | 1 | 2 |
| Q.2(a) What are the different responsibilities of DBA? | [2] | 1 | 1 |
| Q.2(b) Differentiate Primary Key, Candidate Key and Super Key with suitable example. | [3] | 1 | 3 |
| Q.3(a) "In DBMS the issues related to Atomicity, Integrity, Isolation, Redundancy must be addressed." Justify with scenarios in a Data Base. | [2] | 1 | 4 |
| Q.3(b) Consider the following Tables: <i>branch (branch-name, branch-city, assets)</i> <i>customer (customer-name, customer-street, customer-only)</i> <i>account (account-number, branch-name, balance)</i> <i>loan (loan-number, branch-name, amount)</i> <i>depositor (customer-name, account-number)</i> <i>borrower (customer-name, loan-number)</i> Using Relational Calculus solve the following queries: (i) Find the names of all customers who have a loan at the "Mesra" branch but do not have an account at any branch of the bank. (ii) Find the largest account balance | [3] | 2 | 3 |
| Q.4(a) Consider a Data Base of a University system. Show how Simple and Composite attributes, Single valued, Multivalued and Derived attribute can be considered in the Database. | [2] | 2 | 3 |
| Q.4(b) Design an E-R Model for the said University system in 5(a). | [3] | 2 | 3 |
| Q.5(a) (i) What is Discriminator? In the following figure: (ii) State the type of Entities and Relations used. (iii) what will be the primary key for "Payment"? | [2] | 2 | 2 |



- Q.5(b) Write a view in SQL consisting of Branch names and the names of the Customers who have either an Account or a Loan at that Branch. Consider the following tables: [3] 3 2
- Depositor(Cust_Name, Acc_No)
 Account(Acc_No, Branch_Name, Amount)
 Borrower(Cust_Name, Loan_no)
 Loan(Loan_no, Branch_name, Amount)