



MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL A Constituent Institution of Manipal University

I SEMESTER M.C.A.

MAKE UP EXAMINATIONS, DEC 2017

SUBJECT: ADVANCED DATABASE MANAGEMENT SYSTEM [MCA 4104]

REVISED CREDIT SYSTEM (30/12/2017)

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

✤ Answer ALL the questions.

✤ Missing data may be suitable assumed.

1A.	Describe Boyce-Codd and third normal form with an example.	5
1B.	Explain the policies used by the buffer manager to replace a page.	3
1C.	What are the four levels of isolation in SQL?	2
2A.	Explain the various type of constraints on the relationship types of the ER model	5
2B.	Consider a bank database having customer, loan, account, employee and branch as entity types. Each branch of bank allows customers to open account and borrow loans. A customer can open one account, and one account may also belong to one or more customers. Similarly, a customer can take out more than one loan and a loan may be held by more than one customer. The bank has a number of employees working in different branches of the bank. Add appropriate attributes for each entity type. Represent the key attribute, relationship and cardinality ratios. Design an ER Diagram for the Bank database.	3
2C.	What are the desirable properties of decomposition?	2
3A.	Explain the various functional components of a Database Management System with a neat diagram.	5
3B.	How does checkpoint help in reducing the amount of time required during recovery?	3
3C.	Compare and contrast fixed-length and variable-length records.	2

4A.	Explain the state transition diagram of a transaction.	5
4B.	What are the various unary operations in relational algebra?	3
4C.	Consider the relation student(<u>reg_no</u> , sname, dob, place) with 100 records. If we assume uniform distribution of values, V(sname, student)=80 and v(place,student)=25. Find the size of the resultant relation after performing the following operation. a) $\sigma_{place="Manipal"}$ (student) b) $\sigma_{reg_no=10110}$ (student)	2
5A.	Describe the various step involved in query processing with a neat diagram.	5
5B.	How is the locking implemented by the locking manager in order to grant the request of the transactions?	3
5C.	Let relations $r_1(A B C)$ and $r_2(C D F)$ have the following properties: r1 has 10,000 tuples r2	0