

2017**M.Sc.****2nd Semester Examination****ADVANCED DATABASE MANAGEMENT SYSTEM****PAPER—COS-201***Full Marks : 50**Time : 2 Hours**The questions are of equal value.**The figures in the right-hand margin indicate full marks.**Candidates are required to give their answers in their own words as far as practicable.**Illustrate the answers wherever necessary.**Answer Q. No. 1 and any three from the rest.*

1. Answer the following questions (*any five*) : 5×2
- (a) What do you mean by functional dependency?
 - (b) What is Weak Entity set? Give example.
 - (c) How do you communicate with a RDBMS?
 - (d) Define and discuss data constraints.

(Turn Over)

- (e) What are the disadvantages in File Processing System ?
- (f) Name and briefly describe the five SQL built-in functions.
- (g) What is meant by query optimization ?
- (h) What is Relationship ? What is degree of a Relation ?
2. (a) What is a data model? Describe three layers architecture of DBMS. 1+3
- (b) What are the differences between logical data independence and physical data independence? 2
- (c) What are the major functions of the database administrator? 2
- (d) Define the following terms : Primary Key, Composite Key, and Unique Key. 2
3. Write short notes on following topics (any four) : $4 \times 2 \frac{1}{2}$
- (a) Relational Calculus ;
- (b) Data redundancy ;
- (c) File Processing System ;
- (d) Deductive database ;
- (e) Multivalued dependency ;

- (f) BCNF ;
- (g) Horizontal fragmentation.

4. Consider the following relations : 4×2 $\frac{1}{2}$

Borrower (customer-name, loan-number)

Depositor (customer-name, account-number)

Customer (customer-name, street-number, customer-city)

Loan (loan-number, branch-name, city, amount)

Write down expressions in relational algebra for the following queries :

- (a) List all the customers who have either an account or a loan or both.
 - (b) Find the names of all customers who have an account but not a loan.
 - (c) List the names of all customers who have a loan in "Perryridge" branch.
 - (d) List all the customers who have both a loan and an account.
5. (a) Why does normalization used in database? 2
- (b) Write down the drawbacks of normalization process. 2
- (c) Describe the update anomalies with examples. 2

- (d) Why does BCNF is stronger than 3NF ? Discuss with examples. 4
6. (a) What is the purpose of query optimization ? 2
- (b) Describe two-phase locking protocol. 2
- (c) Write down the ACID properties of a transaction. 3
- (d) Why does the recovery process necessary in transaction ? 3

[Internal Assessment : 10 Marks]
