

(Please write your Exam Roll No.)

Exam Roll No

Bharati Vidyapeeth's
Institute of Computer Applications and Management
A-4, Paschim Vihar, New Delhi-63 (March 2017)

Paper Code: MCA - 108	Subject: Database Management Systems
Time: 2 Hours	Maximum Marks: 45

Note: Attempt THREE questions in all. Question No. 1 is compulsory and attempt one question from each unit.

1. Answer all the following questions briefly:- 1.5 x 10 = 15
- (a) The values for an attribute are drawn from a set of values known as_____.
 - (b) The overall description of database is known as _____
 - (c) Along with the GROUP BY clause, one can use the_____clause to define a condition on the group of tuples associated with each value of the grouping attributes.
 - (d) When one column of a table refers to the values in another column of the same table, it introduces a_____integrity constraint.
 - (e) A functional dependency is relationship between_____.
 - (f) What is the role of query processor?
 - (g) List two reasons why do you use several levels of abstraction?
 - (h) What is OUTER JOIN operation?
 - (i) What is lossless decomposition?
 - (j) Why do we need indexes in databases?

UNIT - I

2. (a) Explain how the data is organized in a Network DBMS? How it is different from Hierarchical DBMS? 5
- (b) Construct an ERD for a car insurance company whose customers own one or more cars each. Each car associated with it zero to any number of recorded accidents. 5
3. (a) Explain Categorization and Aggregation with the help of EER Diagram. 5
- (b) An accounting firm wants a simple HR application that will help it to keep track of its Employees, their positions (*or designations*), allowances (*or perks*), salary scales, and which departments have those positions. The application must keep track of all the positions in the firm, the employees appointed to fill up those positions, the allowances granted to these positions, the salary scales for these positions, and the departments having these positions. 5
- Draw ER Diagram and create conceptual schema with assumptions and necessary constraints.

UNIT - II

4. (a) Consider the following table structure: 5
- SUPPLIER(#sno, sname, pincode, city)
- PARTS(#pno, pname, color, weight)
- PROJECTS(#projno, projname,city)
- SHIPMENTS(#sno,# pno, #projno)

Answer following queries in relational algebra expression:

- i. Get supplier name and city for suppliers who supply to any project with a 'red' colored part.
- ii. Get part name, color and project name supplied by supplier with sno 's1' to a project located in 'Banglore'
- iii. Get the project names which are supplied by supplier 'Manoj' with the part 'Bolt'.

Answer following queries in SQL statements:

- iv. Get supplier names for suppliers who supply part no. 3.
- v. Get project name of projects where supplier name is 'ABC Enterprise'

(b) Answer following questions from SQL:

- i. What is the difference between TRUNCATE and DELETE commands? 1
- ii. Discuss syntax of TO_DATE() and TO_CHAR() functions. 2
- iii. Syntax to define a View 1
- iv. ALTER TABLE command with different clauses 1

5. (a) Consider the following relation: 5

Book(Book-title, Authername, Book-type, Listprice, Author-affiliation, Publisher)

Suppose the following functional dependencies exist:

Book-title \rightarrow Publisher, Book-type

Book-type \rightarrow Listprice

Authername \rightarrow Author-affiliation

- i. What normal form is the relation in?
- ii. Apply normalization until you cannot decompose the relation further. State the reasons behind each decomposition.

(b) Explain the use of division operation with the help of an example. Also, write SQL query for the same. 5

UNIT - III

6. (a) Find minimal cover for $R=\{A,B,C,D,E,F\}$ with FDs= $\{AB\rightarrow C, C\rightarrow A, BC\rightarrow D, ACD\rightarrow B, BE\rightarrow C, CE\rightarrow FA, CF\rightarrow BD, D\rightarrow E\}$. Also state the axiom used for each minimization. 5

(b) For a given relation $R=\{A,B,C,D,E,F,G,H\}$ with the following FDs= $\{A\rightarrow BCD, AE\rightarrow F, E\rightarrow G, D\rightarrow H\}$, find all candidate keys. 5

7. (a) Explain the properties of a good decomposition. Also, discuss the significance of minimal cover of a FD set. 5

(b) Suppose we decompose the schema $R=(A,B,C,D,E)$ into $R_1(A,B,C)$ and $R_2(A,D,E)$. Show that this decomposition is lossless if the following FDs hold ($A\rightarrow BC, CD\rightarrow E, B\rightarrow D, E\rightarrow A$). 5