Bharti Vidyapeeth's
Institute of Computer Applications and Management
A-4, Paschim Vihar, New Delhi-63
SECOND SEMESTER [MCA] Internal Examination, February 2019

| 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) Discuss Union compatibility.
   (b) Distinguish Primary key and Unique constraint.
   (c) Explain different levels of abstraction in the DBMS?
   (d) Discuss Insert anomaly.
   (e) List three differences between SQL and relational algebra.
   (f) Compare the use of HAVING and WHERE clause.
   (g) Discuss recursive relationship with example.
   (h) Compare selection and projection operations in relational algebra.
   (i) What is Identifying relationship?
   (j) What do you mean by partial dependency? Give example

UNIT - I

2. (a) In a hospital, many doctors are working and the patients are admitted to the   5
       hospital in a room under the supervision of a doctor. Sometimes patients have to
       undergo certain pathological tests which are carried out in labs.
       Draw ER diagram for the above case study.
   (b) Write Syntax and examples of following SQL commands: 2+
       1. Any two date functions   1+
       2. ORDER BY clause   1+
       3. DEFAULT constraint   1
       4. MODIFY clause in ALTER TABLE command
   (c) Discuss the major disadvantages of keeping information in a file processing   5
       system that led the development of DBMS.

3. (a) Explain sub-class & super-class relationship in ER modeling. Write conceptual   2+
       schema for the given model.   3
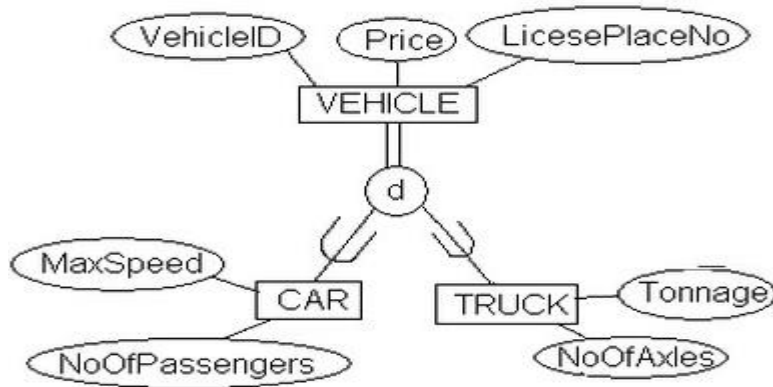
(b) What are different subsystems in DBMS architecture and what functionality do they provide?   5

(c) Consider a relation Doctor (Id, name, specialization, clinic address, hospital). Write SQL queries for   5
1. Create a sequence for generating Doctor's Id. And insert a complete record of Doctor using sequence.
2. Add a column named 'Experience' in the table and it should not be less than 10 years for any record.
3. Find number of ENT doctors in 'Life-care Hospital'
4. List details of Doctors having clinic in Paschim Vihar
5. **Find name of doctor having same specialization as of Dr. Sharma**

UNIT – II

4. (a) Find candidate keys and Primary Key for R={P,Q,R,S,T} and F={ST→Q, PQ→ R, RS→T}   5

(b) Consider following relational schema: 5
EMPLOYEE (SSN, Name, Age, Dno)
SALARY(SSN, Salary)
WORK_ON(Project#, SSN)
PROJECT(Project#, Project_name, PLocation)
Write Relational Algebra Queries and draw query tree for:
1. Find names , department of employees working on 'Bank' project
2. Find names of projects assigned to employees having salary greater than 50K.

(c) Explain Theta Join and Natural Join. Also state the advantage of Joins over Cartesian product.   3+2

5. (a) Write properties of a good decomposition. Consider a relation R (A B C D E F) with following FDs: F ={A→BC , C→A, D→E,F→A, E→D}   2+3
Is the decomposition of R into R1(A C D), R2(B C D) and R3(E F D) lossless?

(b) For given relation R={P,Q,R,S,T}   5
FDs={P→QR, RS→T, Q→S, T→P}. Find Primary Key and normalize till 3 NF.

(c) Write all six Armstrong's Axioms.   5