**Roll No.: \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_**

Amrita Vishwa Vidyapeetham

B.Tech. First Assessment –August 2018

Fifth Semester

Computer Science and Engineering

15CSE320 Database Management Systems

**Time: Two hours Maximum: 50 Marks**

**Answer all questions**

**SET 1 Answer key**

**Part A (30 marks)**

1. Explain the three-schema architecture of database system. List its advantages.(6 marks)

The goal of the three-schema architecture is to separate the user applications and the physical database.

**In this architecture, schemas can be defined at the following three levels: Physical,Logical and View**

**And explanation with diagram**

**3 levels with diagram 3 marks,diagram 1mark,expln 2 marks**

**If they wrote three tier architecture 3 marks**

1. What is data independence? Explain the two types of data independence. (4 marks)

**Physical ,Logical 2 marks**

**Expln 2 marks.**

1. Consider the Publisher Database Schema (10 marks)

Author(**author id**; first name; last name)

Author\_pub(**authorid; pub id**; author position)

Book(**bookid**; book title; month; year; editor)

Publisher(**pubid**; title; book id)

1. How many tuples will be returned by the following relational algebra query?



If 5 books in book table 5 tuples and only single attribute book\_title.

1. Write a relational algebra expression that returns the names of authors who are book editors. 
2. Write a relational algebra expression that returns the details of books which are published

### book⋈publisher

1. Display total number of published by each publisher.

(Publisher)

1. What question does the following relational algebra expression answer?

**Which authors authored a pub that was published in July?**

1. The Prescriptions-MedEx chain of pharmacies has offered to give you a free lifetime supply of medicines if you design its database. Given the rising cost of health care, you agree. Here's the information that you gather:Patients are identified by an SSN, and their names, addresses, and ages must be recorded.

Doctors are identified by an SSN. For each doctor, the name, specialty, and years of experience must be recorded. Each pharmaceutical company is identified by name and has a phone number. For each drug, the trade name and formula must be recorded. Each drug is sold by a given pharmaceutical company, and the trade name identifies a drug uniquely from among the products of that company. If a pharmaceutical company is deleted, you need not keep track of its products any longer.

Each pharmacy has a name, address, and phone number. Every patient has a primary physician. Every doctor has at least one patient. Each pharmacy sells several drugs and has a price for each. A drug could be soldat several pharmacies, and the price could vary from one pharmacy to another.

Doctors prescribe drugs for patients. A doctor could prescribe one or more drugs for several patients, and a patient could obtain prescriptions from several doctors. Each prescription has a date and a quantity associated with it. You can assume that if a doctor prescribes the same drug for the same patient more than once, only the last such prescription needs to be stored.

Pharmaceutical companies have long-term contracts with pharmacies. A pharmaceutical company can contract with several pharmacies, and a pharmacy can contract with several pharmaceutical companies. For each contract, you have to store a start date, an end date, and the text of the contract. Pharmacies appoint a supervisor for each contract. There must always be a super- visor for each contract, but the contract supervisor can change over the lifetime

of the contract.

a. Draw an ER diagram that captures the above information. Identify any constraints that are not captured by the ER diagram.(8 marks)

b. For each of the following concepts give a brief description of what it means, and give an example from your ER diagram for the previous part.(2 marks)

**i Cardinality ii. Multipicity**

a.Total 8 marks

Entities:3marks Relationships 2 marks Attributes 2 marks cardinality and multiplicity 1 marks

b.Multiplicity *The number of instances that can occur on a given end of a relationship, including 0..1, 1, 0..\* or \*,* and 1..\*.

*Cardinality:* *The property of a relationship between a database table and another one, specifying whether it is one-to-one, one-to-many, many-to-one, or many-to-many.*