QUESTION BANK
19CS404-Database Management System and Its Applications

UNIT – I
(PART A – 2 Marks)

Q. No	Questions
1	**Define instance and schema.** **Instance:** Collection of data stored in the database at a particular moment is called an Instance of the database. **Schema:** The overall design of the database is called the database schema.
2	**What is a data model? List out the types of data models.** A data model is a collection of conceptual tools for describing data, data relationships, data semantics and consistency constraints. ▪ Hierarchical database model. ▪ Relational model. ▪ Network model. ▪ Object-oriented database model. ▪ Entity-relationship model
3	**Differentiate aggregation and generalization.** Generalization is a process of generalizing an entity which contains generalized attributes or properties of generalized entities. The entity that is created will contain the common features. Generalization is a Bottom up process. Specialization is a process of identifying subsets of an entity that shares different characteristics. It breaks an entity into multiple entities from higher level (super class) to lower level (sub class).
4	**What are the components of storage manager?** A storage manager is a program module that provides the interface between the low level data stored in a database and the application programs and queries submitted to the system. The storage manager components include a) Authorization and integrity manager b) Transaction manager c) File manager d) Buffer manager
5	**Define the terms i) Entity type ii) Entity set.** **Entity type:** An entity type defines a collection of entities that have the same attributes. **Entity set:** The set of all entities of the same type is termed as an entity set.

6	Write the Characteristics that distinguish the Database approach with the File-based Approach? **File-based System.** 1. Separation and isolation of data 2. Duplication of data 3. Incompatible file formats 4. Data dependence **Database Approach:** 1. Control of data redundancy 2. Data consistency 3. Sharing of data **4. Improved data integrity** **5. Improved security**
7	Mention some responsibilities of a database Administrator. ● Creating and maintaining database standards and policies. ● Supporting database design, creation, and testing activities. ● Managing the database availability and performance, including incident and problem management. ● Administering database objects to achieve optimum utilization. ● Defining and implementing event triggers that will alert on potential database performance or integrity issues.
8	What are the disadvantages of a file processing system? ● Data inconsistency ● Data isolation ● Inefficient data access ● Poor data integrity and security ● File corruption

(PART B – 13 Marks)

Q. No	Questions
1	**With the help of a labeled block diagram, illustrate the architecture of a Database Management System (DBMS). Explain the role of each component in database operations.**
2	**Analyze the different categories of data models in DBMS. Compare and contrast each type with appropriate real-world examples.**
3	**Define data abstraction in DBMS. Evaluate the different levels of abstraction (view level, logical level, and physical level) with examples.**

4	**Explain the significance of keys in a relational database. Identify and differentiate various types of keys such as primary key, candidate key, foreign key, and super key using appropriate examples.**
5	**Illustrate an ER diagram for an employee management system that includes all types of attributes and different relationship types (one-to-one, one-to-many, many-to-one, many-to-many). Provide a detailed explanation of each entity and relationship.**
6	**Construct an ER model for a university management system and discuss its components, including entities, attributes, relationships, and constraints.**
7	**Define a database management system (DBMS) and differentiate its advantages over file processing systems. Additionally, examine the real-world applications of DBMS in various domains.**
8	**Draw an Enhanced ER diagram for a banking database system that includes generalization, specialization, union, and aggregation, and explain how these concepts enhance database design.**

(PART C – 15 Marks)

Q. No	Questions
1	**Explain the fundamental concepts of databases, including DBMS architecture, data models, and schemas. Compare different types of data models with examples and discuss the advantages of using a database management system over a traditional file system.**
2	**A hospital wants to develop a database to manage patient records, doctor assignments, and treatment details. Design an ER diagram for the system with appropriate entities, attributes, relationships, and constraints. Ensure that your design includes patient details, doctor specialization, appointments, and treatment history.**