# EE4791 Database Systems -Tutorial 10 and Sample Answer

1.   Identify the key differences between logical database design and physical database design.

**Answer**

    (a)   Logical database design is to translate a conceptual data model produce into a logical database design to meet the user needs for data sharing and flexibility. However, physical database design is to transform a logical database design into a physical database design to meet the requirements on performance, database integrity, security and resources, etc.

    (b)   Logical database design does not consider the specific DBMS used. Physical database design does.

    (c)   No redundancy should be included in logical database design. However, some redundancy might be introduced in physical databse design for performance reasons.

2.    State the major tasks to be carried out in physical database design and the methods that may be applied in each task.

**Answer**

The major tasks are:
(1)  Designing fields: depending on DBMS used, include design of data type, field integrity control and the handling of missing data
(2)  Transforming logical database design into physical database design: for efficiency purposes, the following methods or a combination of them might be applied to combine data that are frequently referenced beforehand:
   (a)  Denormalization
   (b)  Partitioning: Horizontal Partitioning, Vertical Partitioning
(3)  Design physical database files:
   (a)  Deciding on File Organization: Unordered File, Ordered File, Hashed File
   (b)  Clustering files
(4)  Using and selecting indexes: primary index should be defined for primary key, secondary indexes should also be defined for frequently access paths
(5)  Design for parallel query processing: use horizontal partition to divide tables into portions so that the query on these portions are processed in parallel

3.    Explain the difference between a static Web page and a dynamic one.

**Answer**

A static Web page is fixed in time and cannot include information that change with time depending on program execution. A dynamic page includes information that changes with time and therefore allowing the display of data from querying and storage of user input.

4.   Contrast the following terms:
a)   Two-tier architecture; three-tier architecture.
b)   Fat client; thin client.
c)   ODBC; JDBC.
d)   SQL; Java.


**Answer**
a)   Two-tier architecture; three-tier architecture: Two-tier architecture distributes presentation logic on the client, storage logic on the server, and then places the processing logic either on the client, server, or distributed between the server and client. Three-tier architectures include another server in addition to the client and database server layers; usually, application programs resides and run on the additional server.
b)   Fat client; thin client: A distinction among client capabilities that is based on processing capabilities, a fat client is responsible for more processing—including presentation logic, extensive application logic, and business rules logic—while a thin client is responsible for much less processing.
c)   ODBC; JDBC: While ODBC is a language independent application programming interface for accessing and processing SQL databases, JDBC is language specific and designed for JAVA.
d)   SQL; Java. SQL is a de facto standard language for creating and querying relational databases. Java is a general purpose object-oriented programming language.