Q. What do you mean by hierarchy of files? Give the figure and describe each event.
Ans: The hierarchy of file is how the file will store in the computer. Here the files are divided into several parts the low level is bit/byte level and the height level is data base. The hierarchy of the file structure is as follows.

- Bytes.
- Data items.
- Records.
- Files.
- Data base.

Bytes: A byte is an arbitrary set of eight bits that represent a character. It is the smallest addressable unit in today's computers.
Data items: One or more bytes are combined into a data item to describe an attribute of an object. A data item is sometimes referred to as a field. A field is actually a physical space on tape or disk, whereas a data item is the data stored in the field.
Records: The data items related to an object are combined into a record. Each record has a unique key or id number.
A logical record maintains a logical relationship among all the data items in the record. It is the way data are recorded on a storage medium. A physical record is the way data are recorded on a storage medium.

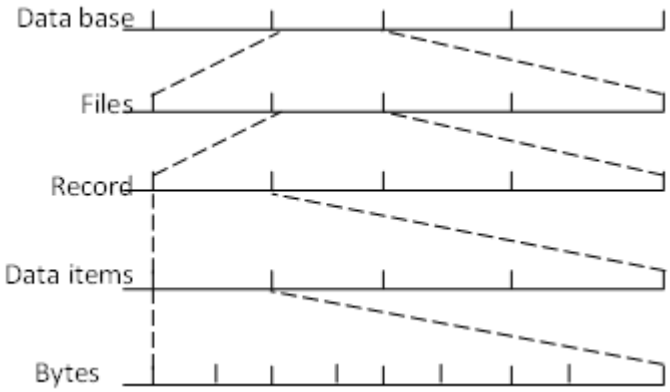

Figure: *hierarchy of file.*

Files: A collection of related records makes up file. The size of a file is limited by the size of memory or the storage medium. Two characteristics determine how files are organized: activity and volatility. File activity specifies the percentage of actual records processed in a single run. File volatility addresses the properties of record changes.
Data base: The highest level in the hierarchy is the data base. It is a set of interrelated files for real-time processing. It contains the necessary data for problem solving and can be used by several users accessing data concurrently.
Q. Mention four method of organizing file and explain them. / Describe indexed sequential organization. / Describe inverted list organization. / Describe direct-access organization.
Ans: There are four methods of organizing files. They are:

- Sequential.
- Indexed-sequential.
- Inverted list.
- Direct access

Sequential: Sequential organization is simply means storing in physical contiguous blocks within files on tape or disk. Records are also in sequential within each block. To access a record, previous records within the block are scanned. Thus sequential record design is best suit for get next activities, reading one record after another without a search delay. In sequential organization, records can be added only at the one end of the file. It is not possible to insert a record in the middle of the file without rewriting the file.

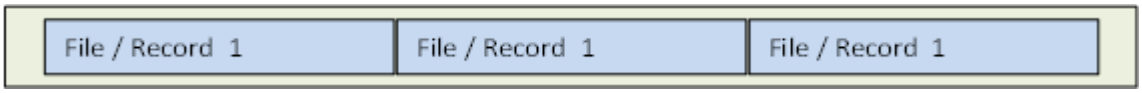

Figure: *sequential organization.*

Indexed-sequential: In indexed sequential organization there is three areas in the disk storage: the prime area, overflow area, and an index area. The prime area contains file records stored by key or ID numbers. All records are initially stored in prime area. The overflow area contains records added to the file that cannot be placed in logical sequence in the prime area. The index area is more like a data dictionary. It contains key of records and their locations on the disk. A pointer associated with each key is an address that tells the system where to find a record.

Figure: *Indexed- sequential organization*.

Inverted list: In an inverted list, records are not necessarily stored in particular sequence. They are placed in the data storage area, but index are updated for the keys and location. Like indexed-sequential storage method, the inverted list organization maintains an index.

Figure: *Inverted list organization.*

Direct access: In direct-access file organization. Records are placed randomly throughout the file. The records need not be in sequence because they are updated directly and rewritten back in the same location. New records are added at the end of the file or inserted in specific locations based on software commands.
Records are accessed by addresses that specify their disk location. An address is required for locating a record, for linking records or for establishing relationships. Addresses are two types:

- **Absolute:** An absolute address represents the physical location of the record. The problem of absolute address is that they become invalid when the file that contains the records is relocated on the disk.
- **Relative:** A relative address gives a record location relative to the beginning of the file. There must be fixed-length records for reference. Another way of locating a record is by the number of bytes it is form the beginning of the file.

Q. Compare four files organizing method.

Method	***Advantages***	***Disadvantage***
Sequential	• *Simple to design.* • *Easy to program.* • *Variable length and blocked record are available.* • *Best use of storage space.*	• *Records cannot be added to middle of file.*

Indexed-sequential	• *Records can be inserted or updated in middle of the file.* • *Processing may be carried out sequentially or randomly.*	• *Unique keys required.* • *Processing occasionally slow.* • *Periodic reorganization of file required.*
Inverted list	• *Used in applications requesting specific data on multiple keys*	
Random	• *Records can be inserted or updated in middle of the file.* • *Better control over record a location.*	• *Calculating address required for processing.* • *Variable-length records nearly impossible to process.*

Q. What do you mean by data base?

Ans: A data base is a collection of interrelated data stored with minimum redundancy to serve many users quickly and efficiently. The general objective is to make information access easy, quick, inexpensive and flexible for the user.

Q. Describe the functions/role of database administrator.

Ans: There are three key functions of database administrator.

- **Managing data activities:** The DBA manages data base activities by proving standards, control procedure and documentation to ensure each user's independence from other users. Standardization is extremely important in a centralization-oriented environment. Every database record must have a standard name, format, and unique strategy for access.
- **Managing database structure:** This responsibility centers around the design of the schema and special programs for controlling redundancy. Maintaining control of change requests, implementing changes in the schema and maintaining user documentation. In the case of documentation the DBA must know what changes have been made, how they were record of test runs and test result.
- **Managing DBMS:** A third responsibility involves the central processing unit (CPU), compiling statistics on system efficiency, including CPU times and elapsed times of inquiry. CPU time is the amount of time the CPU requires to processing a request.

The DBA also investigates user performance complaints and keeps the system's capabilities in tune with user requirements. Modification may have to be made to the communication network.