UNIT – IV
TRENDS IN DATABASE TECHNOLOGY

1. Explain Optical Storage Device?

The most popular form of optical storage is the compact disk read-only memory, can be read by a laser. Optical storage is the write-once, read-many disk, which allows data to be written once, but does not allow them to be erased and rewritten.

2. Define cache.

The cache is the fastest and most costly form of storage. Cache memory is small; its use is managed by the operating system.

3. Define disk controller?

It is an interface between the computer system and the actual hardware of the disk drive. Accept high-level command to read or wire a sector. It attaches checksums to each sector that is written. It also performs remapping of bad sectors.

4. Define RAID.

It is collectively called redundant arrays of inexpensive disk, have been proposed to address the performance and reliability issues. RAID are used for their higher reliability and higher data transfer rate. RAID stands of independent, instead of inexpensive.

5. Define file organization.

A file is organized logically as a sequence of records. These records are mapped on to disk blocks. File are prided as a basic construct in operating system.

6. Define Hash indices?

Indices are based on the values being distributed uniformly across a range
of buckets. The bucket to which a value is assigned is determined by a function called hash function.

7. Define dense index?

An index record appears for every search-key value in the file. The index
record contains the search-key value and pointer to the first data record with that search key value.

8. Define sparse index?

An index record is created for only some of the calues.Each index record contains a search-key value and a pointer to the first data record with that search-key value. To locate a record we find the index entry with the largest search-key value that is less that or equal to the search-key value.

9. Differentiate between dense index and sparse index.

Dense index-An index record appears for every search-key value in the file.Spare index-An index record appears for only some of the search-key values.

10. Explain B+ tree index structure?

The b+ tree index structure is the most widely used of several index Structures that maintain their efficiency despite insertion and deletion of data. A B+ tree index takes the form of a balanced tree in which ever path from the root of the tree to a leaf of the tree is the same length.

11. Define Static Hashing?

File organization based on the technique of hashing allow us to avoid accessing an index structure. Hashing also provides a way of constructing indices.

12. Define Query processing?

Query processing refers to the range of activities involved in extracting data form a database. These activities include translation of queries expressed in high-level database language into expression that cab be implemented at the physical level of the file system.

13. What are the steps involved in query processing?

1. Parsing and translation
2. Optimization
3. Evaluation

14. What is indexing and What are the different kinds of indexing?

Indexing is a technique for determining how quickly specific data can be found. Types:

- Binary search style indexing
- B-Tree indexing
- Inverted list indexing
- Memory resident table
- Table indexing

15. What is meant by query optimization?

The phase that identifies an efficient execution plan for evaluating a query that has the least estimated cost is referred to as query optimization.

16. What is Buffer Manager?

It is program module, which is responsible for fetching data from disk
storage into main memory and deciding what data to be cache in memory.

17. What is hashing?

The conversion of a column's primary key value to a database page number on which the row will be stored. Retrieval operations that specify the key column value use the same hashing algorithm and can locate the row directly. Hashing provide fat retrieval for data that contains a unique key value.

18. List out disadvantage of Hashing?

Lacks locality and sequential Retrieval by key Inability to use Duplicate keys Pre-allocation of Space is not possible. Complexity

19. Define data striping?

Data striping is used to utilized parallelism to improve disk reliability and performance. Data striping distributes data transparently over multiple disks to make them appear as a single large, fast disk.

20. Define double buffering?

The CPU can start processing a block once a transfer to main memory is completed, at the same time the disk I/O processor can be reading and transferring the next block into a different buffer. This technique is called double buffering.

21. What is file descriptor?

A file descriptor(or file header) includes information that describes the file, such as the field names and their data types and the addresses of the file blocks on disk

22. List out the operation of files?

OPEN,FIND,FINDNEXT,READ,INSEART,
DELETE,MODIFY,CLOSE
REORGANIZE

23. What is the purpose of buffer manager?

To control data movement from main memory and secondary memory.

24. What are the cost components for query execution?

Access cost to secondary storage, storage cost, memory usage const computation cost, communication cost.

25. What are the properties of B trees?
Balance tree. Inner nodes having pointer to its children leaf node having pointer to actual data order of the tree is n then each node we can have n-1 elements.
26. How does pipelining improve query-evaluation efficiency? Explain.
Pipeline eliminates the cost of reading and writing temporary relation.

16/10/8 Marks Questions

1. What is RAID? Explain in detail.
2. Describe static hashing and dynamic hashing.
3. Describe the different types of file organization? Explain using a sketch of each of them with their advantages and disadvantages.
4. Briefly write the overall process of data ware housing.
5. Illustrate the issues to implement distributed databases.
6. Describe the structure of B+ tree and give the algorithm for search in the B+ tree with example.
7. Explain why allocations of records to blocks affect database system performance significantly.
8. What are the types of Knowledge discovered data mining? Explain with suitable example.
9. Briefly write the overall process of Multidimensional and Parallel databases.
10. Describe the structure of multimedia databases.
11. Explain the architecture of mobile and web database with neat sketch.