FPRT Core Cse

**Answer 1:**

The process of converting ordinary plain text into unintelligible text and vice-versa is known as cryptography. It not only protects data from theft or alteration, but can also be used for user authentication.

Three types of encryption methods :

1. Symmetric

2. Hash functions.

3. Asymmetric

**Answer 3:**

Persistent connections are meant in part to support pipelining of requests and responses. However, a client must not pipeline its requests until the server has indicated that it will create a persistent connection. We believe that otherwise, certain servers or proxies could become confused. We will allow a client to remember that a given server has recently allowed persistent connections (say, within the past 1 day).

We expect that a server will always try to serve at least one request on any connection. This rule should prevent livelock (lack of progress) even if the server is aggressively closing connections.

Although persistent connections are meant to encourage browsers to use as few simultaneous connections as possible, we could not insist on any specific small number. It appears that (in order to provide early rendering of images in a large HTML file) two connections may be required in some cases.

**Answer 4:**

Multithreading is the phenomenon of executing more than thread in the system, where the execution of these threads can be of two different types, such as Concurrent and Parallel multithread executions. A Thread can be defined as a chunk or unit of process that can be identified as either a user-level thread or a Kernel-level thread. It is usually used for its essential characteristics like it uses the system resources efficiently, high performance, greatly responsive, and also its parallel execution ability.

**Process:**

Process means any program is in execution. Process control block controls the operation of any process. Process control block contains the information about processes for example: Process priority, process id, process state, CPU, register etc. A process can create other processes which are known as Child Processes. Process takes more time to terminate and it is isolated means it does not share memory with any other process.

**Threads:**

Thread is the segment of a process means a process can have multiple threads and these multiple threads are contained within a process. A thread has 3 states: running, ready, and blocked.

**Answer-5**

Indexing is a data structure technique to efficiently retrieve records from the database files based on some attributes on which the indexing has been done.

Indexing is defined based on its indexing attributes. Indexing can be of the following types −

* Primary Index − Primary index is defined on an ordered data file. The data file is ordered on a key field. The key field is generally the primary key of the relation.
* Secondary Index − Secondary index may be generated from a field which is a candidate key and has a unique value in every record, or a non-key with duplicate values.
* Clustering Index − Clustering index is defined on an ordered data file. The data file is ordered on a non-key field.

**Answer 6:**

**Normalization** is a process that is carried out to minimize the redundancies that are present in data in relational databases. This process will mainly divide large tables into smaller tables with fewer redundancies (called “Normal forms”). These smaller tables will be related to each other through well defined relationships. In a well normalized database, any alteration or modification in data will require modifying only a single table.

**Denormalization** is the reverse process of the normalization process. Denormalization works by adding redundant data or grouping data to optimize the performance. Even though adding redundant data sounds counter-productive, sometimes denormalization is a very important process to overcome some of the shortcomings in the relational database software that may incur heavy performance penalties with normalized databases (even tuned for higher performance).

We need normalisation and denormalisation because of following reasons:

1. Maintaining history: Data can change during time, and we need to store values that were valid when a record was created.
2. Improving query performance: Some of the queries may use multiple tables to access data that we frequently need. Think of a situation where we’d need to join 10 tables to return the client’s name and the products that were sold to them.
3. Speeding up reporting: We need certain statistics very frequently. Creating them from live data is quite time-consuming and can affect overall system performance.
4. Computing commonly-needed values up front: We want to have some values ready-computed so we don’t have to generate them in real time.

**Answer 7:**

## **Inner Join**

An inner join focuses on the commonality between two tables. When using an inner join, there must be at least some matching data between two (or more) tables that are being compared. An inner join searches tables for matching or overlapping data. Upon finding it, the inner join combines and returns the information into one new table.

## **Outer Join**

An outer join returns a set of records (or rows) that include what an inner join would return but also includes other rows for which no corresponding match is found in the other table.

There are three types of outer joins:

* Left Outer Join (or Left Join)
* Right Outer Join (or Right Join)
* Full Outer Join (or Full Join)

**Answer 8:**

A special high-speed [storage](https://www.webopedia.com/TERM/M/mass_storage.html) mechanism. Cache can be either a reserved section of [main memory](https://www.webopedia.com/TERM/M/main_memory.html) or an independent high-speed [storage device](https://www.webopedia.com/TERM/S/storage_device.html). Two types of caching are commonly used in [personal computers](https://www.webopedia.com/TERM/P/personal_computer.html):memory caching and disk caching.

Caching lies under the direction of the cache manager, which operates continuously while Windows is running.

Caches usually have more management logic than a map, which are nothing else but a more or less simple data structure. Whereas hashMap is non synchronized. It is not-thread safe and can't be shared between many threads without proper synchronization code.

**Answer 9:**

This problem is mainly caused due to size problems , like considering this code.

var cur = 100000000;

var bcast = 154655675;

var addresses = []; while (cur <= bcast){

cur += 1; addresses.push(cur);

}

addresses.length

here , it will surly throw this error

‘FATAL ERROR: CALL\_AND\_RETRY\_2 Allocation failed - process out of memory’

We can increase the default limits by passing --max-old-space-size=<value> which is in MB.

The example will allow node's heap use up to 4GB (4096 **megabytes**) of memory:

node --max-old-space-size=4096 app.

This will surely solve the problem.