What is RTOS ?

* "RTOS" stands for Real-Time Operating System.
* It is a type of operating system used for real time applications in embedded systems.

How is it different from GPOS ?

RTOS is known for its characteristics that helps is in many applications.

* Reliability :

RTOS provides more reliability as compared to GPOS.

It has more control over events in real time and they are always available to provide service.

Some systems are required to run for a longer period of time without human intervention, for these purposes RTOS can be very useful.

* Determinism:

RTOS entirely functions over deadlines which makes it more efficient.

It means that for each process a specifc deadline or a time-period is specified within which it has to finish that particular process.

* Scheduling:

In this operating system, user has more control over scheduling a particular task or a process depending on its priority.

So we can define the priority for that particular task and also the frequency with which it should occur ( more like a delay).

In GPOS all the scheduling functions are process based and user has less control on them.

Task defined in RTOS are preemptive.

Generally, in an operating systems there are two types of tasks viz. High priority tasks and Low priority tasks.

High priority task can meet their deadlines consistently because of the preemptive property.

* Scalability:

RTOS is used in wide variety of applications in the field of embedded systems.

So it is scalable depending on the application requirements (i.e we can add or remove modular components depending on our use).

Types of tasks in RTOS:

Hard real-time tasks:

These types of tasks strictly run based on deadlines.

If a particular task is not finished within the predetermined deadlines then the system is considered to be a failed system.

Applications : Anti-missile systems, Air bag mechanisms etc.

Firm real-time tasks:

Similar to hard real-time tasks they should also meet the deadlines.

But if they don't meet then that doesn't make this a failed system, but the results that are produced after the deadlines are discarded and the utility of the system becomes zero.

Applications : Multimedia

Soft real-time systems:

Here the deadlines are not expressed as some absolute value but they are expressed as a average response time required by the task.

If the task is finished then the utility of the task is 100%. But if they fail to meet them, then the utility of the system gradually falls depending on the extra time that is taken past the deadline.