

Q. What is process management in O.S ?

• process management is an integral part of any modern day O.S. The OS must allocate resources to processes, enable processes to share and exchange information, protect the resources of each process from other processes and enables synchronization among processes.

Q. What are different states of process ? Explain with diagram.

• There are 7 states are:-

- ① New
- ② Running
- ③ Block or wait
- ④ Ready
- ⑤ Completion or termination
- ⑥ Suspend
- ⑦ Suspend wait.

① New :-

A program this state when the process has just been created. It is the initial state in process cycle.

② Ready :-

In this state, the process is waiting to be assigned the processor by the short term scheduler. So it can run.

③ Running :-

In this state when the process instructions are being executed by the processor.

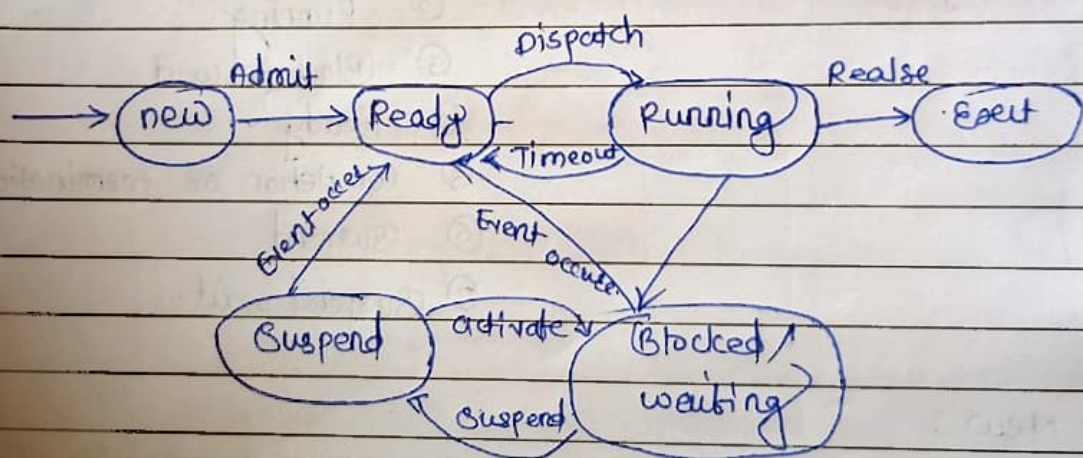
(Block or wait :-

From the Running State, a process can make the transition to the block or wait state depending upon the scheduling algorithm.

⑤ Termination :-

When a process finishes its execution, it comes in the termination state. all context of the process will also be deleted. the process will be terminated by the o.s.

⑥ Suspend :-



4. What is concurrent process in O.S?

→ concurrency in operating system refers to the ability of an operating system to handle multiple tasks or process at a same time.

5. What are the principles of concurrency in O.S?

→ concurrency is interleaving of processes in time to give the appearance of simultaneous execution. Thus it differs from parallelism which refers general simultaneous execution.

- Sharing global resources safely is difficult.
- optimal allocation of resources is difficult.
- locating programming errors can be difficult, bcz. the context in which error occurs cannot always be reproduced easily.

6. What is device management?

• controlling input output devices like disk, microphone, keyboard etc accessories and supporting unit like control channels.

• A process may require various resources including main memory, file access and access to disk drive and others.

• If resources are available they could be allocated

• The fundamentals of I/O devices may be divided into three categories:

1. Block Device:

It stores data in fixed size blocks.

2. character device:

It transmit or accept stream of characters.

5. Network device :-

It is used for transmitting the data in packet format.

7. What is file management?

• File management is one of the basic but important features provided by O.S.

• It is an software that handle or manages the files (binary, text, pdf, docs) present in computer software.

• The File system in O.S is capable of managing individual as well as groups of files present in the computer system.

• There are three types of O.S :-

① text File :-

A text file is a non executable file containing a sequence of numbers, symbols and letters organized in the form of lines.

② Source File :-

A Source File is an executable file that contains a series of functions.

③ objects File :-

File that contains object codes in the form of assembling language code or machine lang. code

9. Explain critical section problem with producer-consumer problem?

→ critical section is the part of program which tries to access shared resources.

critical section cannot be executed by more than one process. critical section problem is used to design a set of protocols which can ensure that race condition among processes will never arise.

Solution -

1. Mutual exclusion -

By mutual exclusion, we mean that if one process is executing inside critical section then the other processes must not enter in critical section.

2. progress:-

If one process doesn't need to execute in critical section then it should be non-stop other processes to get into the critical section.

3. Bounded waiting -

We should be able to predict the waiting time for every process to get into the critical section.

10. What is deadlock? Explain how deadlock is detected?

A deadlock is a situation where a set of processes are blocked because each process is holding a resource and waiting for another resource acquired by some other process.

Deadlock can arise if following conditions hold simultaneously.

- ① Mutual exclusion
- ② Hold and wait
- ③ No preemption.
- ④ Circular wait.

These are three ways to handle deadlock:

(i) Deadlock prevention or avoidance

(ii) Avoidance

(iii) Deadlock detection and recovery

12. What is PCB? explain various fields and info stored in PCB.

Process State
process Number
program counter
Registers
Memory limits
List of open files
=
=

PCB:

is data structure that contains information of process related to it. The process control block is also known as task control block.

process state:

• This specifies the process state i.e. ready, new, running.

process Number:

• Shows numbers of particular process.

program counter =

• contains address of next block.