

Model Answer
Subject: Introduction to Operating System (PCSC-301)
BSC-III

1i. Optical Memory is a data store where data is stored on an optical medium using optical systems and properties. The medium can be termed as CD-ROM, DVD etc. The read, write and erase operation is done with a laser beam of specific wavelength assigned for a particular operation. Optical memory is an ideal solution for storing large quantities of data very inexpensively, and more importantly, transporting that data between computer devices.

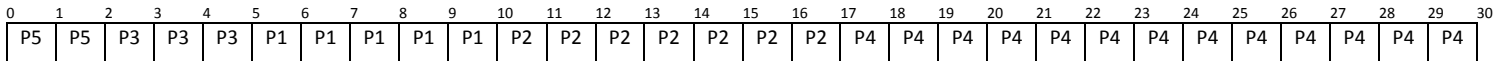
1ii. Virtual memory is a feature of an operating system (OS) that allows a computer to compensate for shortages of physical memory by temporarily transferring pages of data from random access memory (RAM) to disk storage. One can say it is an extension of random access memory (RAM) into secondary memory like HDD.

1iii. please refer note.

1iv. The wasted memory is that memory which is unused and which can't be given to the process. When the process comes which require memory and the memory cannot be allocated as per the requirement of that process, is called as the wasted memory. Fragmentation is the term which is associated with wasted memory.

1v. please refer note.

2. GANTT chart for SJF:



Process	Burst time	Response time	Average Response time= $(5+10+2+17+0)/5=6.8$
P1	5	5	
P2	7	10	
P3	3	2	
P4	13	17	
P5	2	0	

SRTF checks new process arrival list on beginning of each quantum to choose the shortest remaining time among active processes to bring it into the current CPU. For SRTF (Quantum=1), there are no processes arrive after the time 0. Therefore, the checking for new processes would not have any effect in the GANTT chart. Hence, the GANTT chart remains same for SRTF (Quantum=1) and the Average response time=6.8.

3.

	P1	P2	P3	
Max. Requirement	8	4	3	Total in current allocation=11
Current Allocation	5	3	3	Total resources=12
Needs left	3	1	0	Resources left=12-11=1
				Therefore, at least one process can be served as per the current table. i.e Need of process P2 (need left=1) can be served. Thus, the current status is feasible and safe.

4. please refer note.

5. please refer note.

6. For first part please refer note.

Non-preemptive Scheduling: In non-preemptive mode, once if a process enters into running state, it continues to execute until it terminates or blocks itself to wait for Input/Output or by requesting some operating system service.

Preemptive Scheduling: In preemptive mode, currently running process may be interrupted and moved to the ready state by the operating system.

When a new process arrives or when an interrupt occurs, preemptive policies may incur greater overhead than non-preemptive version but preemptive version may provide better service.

It is desirable to maximize CPU utilization and throughput, and to minimize turnaround time, waiting time and response time.

7. please refer note.

8. please refer note.