

Techno International – Batanagar
Sub: Operating System (CS 603)
C.S.E Department

Group – A

1. Choose the correct alternative from the following:

- I. Starvation can be avoided by
a) Paging b) Page replacement c) Aging d) Framing
- II. A thread is referred to as
a) Process b) Light weight process c) Task d) Program .
- III. The full form of SPOOL is
a) Shared Processor Object Oriented Language
b) Simultaneous Peripheral Operations Online.
c) Special purpose Object Oriented Language d) None of these.
- IV. Throughput is a measure of
a) Time taken to execute a process
b) Number of processes that are in the ready queue
c) Number of processes completed per unit of time d) None of these.
- V. What is a short-term scheduler?
a) It selects which process has to be brought into the ready queue
b) It selects which process has to be executed next and allocates CPU
c) It selects which process to remove from memory by swapping
d) None of these
- VI. If a process is executing in its critical section, then no other processes can be executing in their critical section. This condition is called
a) mutual exclusion b) critical exclusion
c) synchronous exclusion d) asynchronous exclusion
- VII. Which one of the following is a synchronization tool?
a) thread b) pipe c) semaphore d) socket
- VIII. Time quantum is defined in
a) shortest job scheduling algorithm b) round robin scheduling algorithm
c) priority scheduling algorithm d) multilevel queue scheduling algorithm
- IX. In multilevel feedback scheduling algorithm
a) a process can move to a different classified ready queue
b) classification of ready queue is permanent
c) processes are not classified into groups
d) none of the mentioned

- X. Semaphore is a/an _____ to solve the critical section problem.
a) hardware for a system b) special program for a system
c) integer variable d) none of the mentioned
- XI. A state is safe, if :
a) the system does not crash due to deadlock occurrence
b) the system can allocate resources to each process in some order and still avoid a deadlock
c) the state keeps the system protected and safe
d) all of the mentioned
- XII. Which one of the following can not be scheduled by the kernel?
a) kernel level thread b) user level thread c) process d) none of the mentioned
- XIII. Which of the following page replacement algorithms suffers from Belady's Anomaly?
a) Optimal replacement b) LRU
c) FIFO d) Both optimal replacement and FIFO
- XIV. FAT stands for :
a) File Attribute Transport b) File Allocation Table
c) Fork At Time d) None of these
- XV. CPU generated address is :
a) Logical Address b) Physical Address
c) both A and B d) None of these.
- XVI. The time taken to move the disk arm to the desired cylinder is called the :
a) positioning time b) random access time c) seek time d) rotational latency

Group – B

1. What do you mean by Operating System? What are the important functions of an Operating System?
2. What do you mean by Multitasking?
3. What do you mean by Multiprogramming?
4. What do you mean SPOOLING?
5. What is Process? What are the state of a process and describe it with suitable picture?
6. What is Process Control Block (PCB)? (Describe all information it contain)
7. Write the difference between Long Term Scheduler, Short Term Scheduler, and Medium Term Scheduler.
8. What do you mean by Context Switch with proper example?
9. What is Thread? Write the Difference between Process and Thread? What are the benefits of Thread?
10. What is User Level Threads and Kernel Level Threads? Write the Difference between User Level Threads and Kernel Level Threads.
11. What are the relationships in Multithreading models (between User Level Threads and Kernel Level Threads)? With proper diagram.

12. Consider the following 4 processes with the length of CPU burst time given in milliseconds.

Process	Arrival time	Burst time
P1	0	5
P2	1	3
P3	2	3
P4	4	1

Find out the i) Average waiting time, ii) Average turn around time, iii) Average response time For preemptive SJF scheduling.

13. Consider the following 3 processes with the length of CPU burst time given in milliseconds.

Process	Burst time
P1	24
P2	3
P3	3

Find out the Average waiting time for RR scheduling.(if the time quantum is 4 ms)

14. Consider the following processes with the length of CPU burst time given in milliseconds.

Process	Burst time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

Find out the Average waiting time for Priority scheduling (smallest integer=highest Priority, and all processes arrive at time 0)

15. What is Semaphore? What are the operations on it? Determine the solution of ‘Readers-writers Problem’ using Semaphore.

16. Determine the solution of ‘Dining-Philosopher’s Problem’ using Semaphore.

17. What do you mean by Deadlock? Write down all the necessary condition of Deadlock.

18. Consider the following snapshot of a system where p0,p1,p2,p3,p4 are the processes and A, B, C are the resource type.(A(10 instances), B (5 instances), C (7 instances) and Snapshot at time T0)

	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P0	0	1	0	7	5	3	3	3	2
P1	2	0	0	3	2	2			
P2	3	0	2	9	0	2			
P3	2	1	1	2	2	2			
P4	0	0	2	4	3	3			

- i) What is the content of need matrix?
- ii) Is the system in safe state?
- iii) If a request from process p1 arrives for (1,0,2), can this request be granted immediately ?

19. Write the Difference between Logical and Physical Address Space.
20. What do you mean by Dynamic Loading?
21. What do you mean by Dynamic Linking?
22. What is First-fit, Best-fit, Worst-fit memory allocation techniques?
23. What do you mean by Fragmentation? What are the types of Fragmentation? And describe it.
24. Write a note on Paging.
25. Write a note on Segmentation.
26. What is Virtual Memory?
27. What do you mean by Demand Paging? Describe it.
28. Consider the following page reference string:
7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1.
 Calculate the number of page faults and page fault rate for the following algorithms.
 Assuming 3 frames are available and all are initially empty.
 - i) **FIFO** Page Replacement.
 - ii) **Optimal** Page Replacement.
 - iii) **LRU** Page Replacement.
29. What do you mean by “Belady’s anomaly”? Describe it with example.
30. Write a note on Thrashing.
31. Write a note on File Allocation Table.
32. Write a note on Inode.
33. Write a note on Direct Memory Access (DMA).
34. What are the services provided by Kernel I/O Subsystem? Describe it.
35. Write a note on Authentication, Program Threats and System Threats.
36. Suppose a disk drive has 200 cylinders numbered 0-199. The current position of the arm is at **50**. Consider a disk queue for request are
95, 180, 34, 119, 11, 123, 62, 64.
 Calculate the Total Head Movement for
 - i. FCFS Scheduling.
 - ii. SSTF Scheduling.
 - iii. SCAN Scheduling.
 - iv. LOOK Scheduling.
37. Write a note on Boot Block and Bad Blocks.