OPERATING SYSTEM TEST

1. Which of the following is NOT a valid deadlock prevention scheme? (GATE CS 2000)
(a) Release all resources before requesting a new resource
(b) Number the resources uniquely and never request a lower numbered resource than the last one requested.
(c) Never request a resource after releasing any resource
(d) Request and all required resources be allocated before execution.

2. Let m[0]…m[4] be mutexes (binary semaphores) and P[0] …. P[4] be processes. Suppose each process P[i] executes the following:

```
wait (m[i]); wait(m[(i+1) mode 4]);
  ------
  release (m[i]); release (m[(i+1)mod 4]);
```

This could cause (GATE CS 2000)
(a) Thrashing
(b) Deadlock
(c) Starvation, but not deadlock
(d) None of the above

3. A graphics card has on board memory of 1 MB. Which of the following modes can the card not support? (GATE CS 2000)
(a) 1600 x 400 resolution with 256 colours on a 17 inch monitor
(b) 1600 x 400 resolution with 16 million colours on a 14 inch monitor
(c) 800 x 400 resolution with 16 million colours on a 17 inch monitor
(d) 800 x 800 resolution with 256 colours on a 14 inch monitor

4 Consider a virtual memory system with FIFO page replacement policy. For an arbitrary page access pattern, increasing the number of page frames in main memory will (GATE CS 2001)
a) Always decrease the number of page faults
b) Always increase the number of page faults
c) Sometimes increase the number of page faults
d) Never affect the number of page faults

5. Which of the following requires a device driver? (GATE CS 2001)
a) Register
b) Cache
c) Main memory
d) Disk

6. Consider a machine with 64 MB physical memory and a 32-bit virtual address space. If the page size is 4KB, what is the approximate size of the page table? (GATE 2001)
(a) 16 MB
(b) 8 MB
(c) 2 MB
(d) 24 MB

OPERATING SYSTEM TEST

7. Consider Peterson's algorithm for mutual exclusion between two concurrent processes i and j. The program executed by process is shown below.

```
repeat

 flag [i] = true;
 turn = j;
 while ( P ) do no-op;
 Enter critical section, perform actions,  then exit critical
 section
 flag [ i ] = false;
 Perform other non-critical section actions.
until false;
```

For the program to guarantee mutual exclusion, the predicate P in the while loop should be (GATE 2001)

a) flag [j] = true and turn = i

b) flag [j] = true and turn = j

c) flag [i] = true and turn = j

d) flag [i] = true and turn = i

8. More than one word are put in one cache block to (GATE 2001)
(a) exploit the temporal locality of reference in a program
(b) exploit the spatial locality of reference in a program
(c) reduce the miss penalty
(d) none of the above

9. Which of the following statements is false? (GATE 2001)
a) Virtual memory implements the translation of a program's address space into physical memory address space
b) Virtual memory allows each program to exceed the size of the primary memory
c) Virtual memory increases the degree of multiprogramming
d) Virtual memory reduces the context switching overhead.

10. Consider a set of n tasks with known runtimes r1, r2, … rn to be run on a uniprocessor machine. Which of the following processor scheduling algorithms will result in the maximum throughput? (GATE 2001)
(a) Round-Robin
(b) Shortest-Job-First
(c) Highest-Response-Ratio-Next
(d) First-Come-First-Served

OPERATING SYSTEM TEST

11. Suppose the time to service a page fault is on the average 10 milliseconds, while a memory access takes 1 microsecond. Then a 99.99% hit ratio results in average memory access time of (GATE CS 2000)
(a) 1.9999 milliseconds
(b) 1 millisecond
(c) 9.999 microseconds
(d) 1.9999 microseconds

12. Which of the following does not interrupt a running process? (GATE CS 2001)
(a) A device
(b) Timer
(c) Scheduler process
(d) Power failure

13. Which of the following scheduling algorithms is non-preemptive? (GATE CS 2002)

a) Round Robin
b) First-In First-Out
c) Multilevel Queue Scheduling
d) Multilevel Queue Scheduling with Feedback

14. Increasing the RAM of a computer typically improves performance because:
(a) Virtual memory increases
(b) Larger RAMs are faster
(c) Fewer page faults occur
(d) Fewer segmentation faults occur

15. The minimum number of page frames that must be allocated to a running process in a virtual memory environment is determined by (GATE CS 2004)
a) the instruction set architecture
b) page size
c) physical memory size
d) number of processes in memory

16. consider the 3 processes, P1, P2 and P3 shown in the table

process	Arrival time	Time unit required
P1	0	5
P2	1	7
P3	3	4

The completion order of the 3 processes under the policies FCFS and RRS (round robin scheduling with CPU quantum of 2 time units) are
(A) **FCFS**: P1, P2, P3 **RR2**: P1, P2, P3
(B) **FCFS**: P1, P3, P2 **RR2**: P1, P3, P2
(C) **FCFS**: P1, P2, P3 **RR2**: P1, P3, P2
(D) **FCFS**: P1, P3, P2 **RR2**: P1, P2, P3

17. A system uses FIFO policy for page replacement. It has 4 page frames with no pages loaded to begin with. The system first accesses 100 distinct pages in some order and then accesses the same 100 pages but now in the reverse order. How many page faults will occur? (GATE CS 2010)

(A) 196
(B) 192
(C) 197
(D) 195

18. Which of the following statements are true? (GATE CS 2010)
I. Shortest remaining time first scheduling may cause starvation
II. Preemptive scheduling may cause starvation
III. Round robin is better than FCFS in terms of response time
(A) I only
(B) I and III only
(C) II and III only
(D) I, II and III

19. Which of the following is NOT true of deadlock prevention and deadlock avoidance schemes?
(A) In deadlock prevention, the request for resources is always granted if the resulting state is safe
(B) In deadlock avoidance, the request for resources is always granted if the result state is safe
(C) Deadlock avoidance is less restrictive than deadlock prevention
(D) Deadlock avoidance requires knowledge of resource requirements a priori

20.The initial value of the semaphore that allows only one of the many processes to enter their critical sections, is

A. 8

B. 1

C. 16

D. 0

E. None of the above