Register Number.....

B.E. DEGREE EXAMINATIONS: APRIL/MAY 2009

Fourth Semester

COMPUTER SCIENCE AND ENGINEERING

U07CS403 Operating Systems

Time: Three Hours **Maximum Marks: 100**

Answer ALL the Questions:-

PART A (20 x 1= 20 Marks)

1. Modes of operation in operating system

   a) Monitor mode
   b) User mode
   c) System mode
   d) All the above

2. Activity associated with Secondary Storage management

   a) Mapping files to secondary storage
   b) Free space management
   c) Backing up files on stable storage media
   d) Deciding which process are to be loaded into memory when memory space become available.

3. Interface between user and operating system.

   a) Compiler
   b) Command Interpreter
   c) Assembler
   d) All the above

4. Context Switch time highly depends on

   a) Hardware
   b) User
   c) Application of a program
   d) both hardware and application of a program

5. Operating System that supports kernel threads

   a) Solaris2
   b) DOS
   c) Windows NT
   d) All the above

6. Problem in First-Come, First-Serve algorithm is

   a) Aging
   b) Starvation
   c) Convoy effect
   d) indefinite blocking

7. Critical Section problem must satisfy

   a) resource-sharing
   b) Progress
   c) responsiveness
   d) All the above

8. Round Robin Scheduling algorithm is designed for

a) Time Sharing System
b) Multiprogramming System
c) Multitasking System
d) Batch System

9. Condition that leads to deadlock

a) Indefinite blocking
b) Bounded waiting
c) Mutual Exclusion
d) All the above

10. Deadlock detection algorithm in a resource allocation system with multiple instances of resource types requires an order of ------- operations to detect a deadlock.

a) mxn
b) m^2xn
c) mxn^2
d) n^2

11. Solution to external fragmentation problem

a) Compaction
b) Swapping
c) indexing
d) frame table

12. The percentage of times that a particular page number is found in

a) TLB
b) Page Table
c) Page table length register
d) forward mapped page table

13. Effects of thrashing is limited by

a) Optimal page replacement algorithm
b) Second Chance Algorithm
c) Page Buffering Algorithm
d) Local replacement algorithm

14. Virtual address space that include holes are called as

a) dense address space
b) scattered address space
c) sparse address space
d) heap address space

15. Consistency semantics: "Writes to an open file by a user are visible immediately to other users that have this file open" used by,

a) Adrew file system
b) Unix File System
c) Both a and b
d) Windows file system

16. Acyclic graph directory structure enables

a) deletion
b) users to share files and subdirectories
c) garbage collection
d)searching

17. Problem in linked allocation

a) External fragmentation
b) Size declaration problem
c) reliability
d) All the above

18. Advantage of bit vector

a) Simplicity
c) finding 'n' consecutive free block
b) Finding first free block
d) All the above

19. Replacing each bad sector logically with one of the spare sector is called as

a) Forwarding
c) sector management
b) Sector replacement
d) garbage collection

20. ---------- couples the products of data from the consumer.

a) Spooling
c) Double buffering
b) Caching
d) I/O scheduling

PART B (5 x 16 = 80 Marks)

21. a. Define the essential properties of the following types of operating systems: (16)

i. Time Sharing
ii. Distributed
iii. Real- Time Systems
iv. Multiprocessor

(OR)

b. i. How does the distinction between monitor mode and user mode function as a rudimentary form of protection system? (12)

ii. What are the five major activities of an operating system in regard to process management? (4)

22. a. i. What are the benefits and demerits of each of the following? Consider both the systems and the programmers' levels. (10)

1). Direct and indirect communication
2). Symmetric and asymmetric communication
3). Automatic and explicit buffering
4). Send by copy and send by reference
5). Fixed-sized and variable-sized messages

ii. Describe the actions taken by a kernel to switch context between processes. (6)

(OR)

b. Consider the following set of processes, with the length of the CPU-burst time given in milliseconds (16)

Process	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4

The processes are assumed to have arrived in the order P1, P2, P3, and P4.

i. Draw Gantt charts illustrating the execution of these processes using FCFS, SJF, a non preemptive priority and RR scheduling.

ii. What is the turnaround time of each process for each of the scheduling algorithm?

iii. What is the waiting time of each process for each of the scheduling algorithm?

23. a. With suitable algorithm explain Deadlock avoidance. (16)

(OR)

b. i. Given the memory partitions of 100 KB, 500 KB, 200 KB and 600 KB, how much each of the first-fit, best-fit and worst-fit algorithms place processes of 212 KB, 417 KB, 112 KB and 426 KB(in order)? Which algorithm makes the most efficient use of memory? (8)

ii. Explain briefly the implementation of Paging. (8)

24. a. i. What is the cause of thrashing? How does the system detect thrashing? Once it detects thrashing, what can the system do to eliminate this problem? (12)

ii. How many page faults occur for the following reference string, for three page frames?

1, 2 ,4, 5, 1, 2, 5, 6, 1, 3, 4, 2, 3, 4 (4)

(OR)

b. Briefly describe the schemes for defining the logical structure of a directory. (16)

25. a. i. Discuss the following Allocation Methods: (12)

1). Contiguous 2). Linked 3). Indexed

ii. Outline the implementation of Free Space Management. (4)

(OR)

b. i. Explain the components of Linux System (8)

ii. Describe the Inter-process Communication in UNIX (8)

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