KATHMANDU UNIVERSITY
End Semester Examination
July/August, 2024

Marks Scored:

Level : B.Sc.
Year : III

Course : COMP 307
Semester : II

Exam Roll No. :

Time: 30 mins.

F. M. : 10

Registration No.:

Date : 16 AUG 2024

SECTION "A"

[20 Q. × 0.5 = 10 marks]

Choose and mark [X] in the most appropriate option from each set of choices

1. The process of gradually increasing the priority of the process in Process scheduling algorithm is known as
   [ ] Aging [ ] Ageing [ ] Quantum [ ] Feedback

2. For the Page Frame size 3 and the reference shrings:7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1. The total number of page fault if _____ if we run LRU algorithm.
   [ ] 12 [ ] 8 [ ] 13 [ ] 7

3. Considering the size of the cylinder number0 to 199 and the request of 98,183,37,122,14,124,65,67 has been made to run SSTF disk scheduling algorithm, the total number of head movement is_____
   [ ] 640 [ ] 208 [ ] 236 [ ] 557

4. Round robin algorithm is essentially the preemptive version of
   [ ]SJF scheduling [ ]FCFS scheduling
   [ ]SRT scheduling [ ]Priority scheduling

5. Which one of the following is not the text editor for Linux environment?
   [ ] scp [ ] Emacs [ ] nano [ ] vi

6. A program that is responsible for the context switching in the OS process is referred as _____ program.
   [ ] Dispatcher [ ] Kernel [ ] Thread [ ] Identifier

7. The number of processes completed per unit time is known as _____.
   [ ] Output [ ] Throughput [ ] Efficiency [ ] Capacity

8. What is the mounting of file system?
   [ ] creating of a filesystem
   [ ] deleting a filesystem
   [ ] attaching portion of the file system into a directory structure
   [ ] removing portion of the file system into a directory structure

9. The information about all files is kept in :
   [ ] swap space [ ] operating system
   [ ] seperate directory structure [ ] None of these

10. In UNIX, the open system call returns :
    [ ] pointer to the entry in the open file table
    [ ] pointer to the entry in the system wide table
    [ ] a file to the process calling it
    [ ] None of these

11. What is the drawback of banker's algorithm?
[ ] in advance processes rarely know that how much resource they will need
[ ] the number of processes changes as time progresses
[ ] resource once available can disappear
[ ] all of the mentioned

12. A problem encountered in multitasking when a process is perpetually denied necessary resources is called
[ ] deadlock [ ] starvation [ ] inversion [ ] aging

13. Program always deals with
[ ] logical address [ ] absolute address
[ ] physical address [ ] relative address

14. Spinlocks are :
[ ] CPU cycles wasting locks over critical sections of programs
[ ] locks that avoid time wastage in context switches
[ ] locks that work better on multiprocessor systems
[ ] All of these

15. The signal operation of the semaphore basically works on the basic _____ system call.
[ ] continue() [ ] wakeup() [ ] getup() [ ] start()

16. Belady's Anomaly is the characteristics of the _____ page Replacement Algorithm.
[ ] FIFO [ ] LRU [ ] Optimal [ ] Second Chance

17. In Operating System the term thrashing:
[ ] is a natural consequences of virtual memory system
[ ] can always be avoided by swapping
[ ] always occurs on large computers
[ ] can be caused by poor paging algorithms

18. In the multiprogramming system, a set of processes is deadlock if each process in the set is waiting for an event to occur that can be initialized only by another process in the set. Which of the following is not one of the four conditions that are necessary for deadlock to occur?
[ ] nonpreemption [ ] process suspension
[ ] partial assigment of resources [ ] circular wait

19. Real time systems are
[ ] primarily used on mainframe computers
[ ] used for monitoring events as they occur
[ ] used for program analysis
[ ] used for real-time interactive

20. Block or Buffer caches are used
[ ] to improve disk performance
[ ] to handle interrupts
[ ] to increase the capacity of main memory
[ ] to speed up main memory read operation

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SECTION "B"

[6Q. × 4 = 24 marks]

Attempt *ANY SIX* questions.

1. How do you define Race Condition Operating system? Explain the use of semaphore variable to attain the Mutual Exclusion.

2. What do you mean by device drivers? Explain how the variation in the I/O devices affects the performance in the Operating system.

3. Explain the three major objectives of an Operating System.

4. What do you mean by dispatcher? Explain trace of the execution of the instruction in multiprogramming operating System.

5. What is Critical section Problem? What condition(s) when hold, will avoid Critical section Problem?

6. Explain the Fixed memory portioning technique in detail.

7. Explain the two characteristics of Distributed system.

SECTION "C"

[2Q.× 8 = 16 marks]

Attempt ALL questions.

8. Explain with neat and clear diagram how the transition of different threads from one state to another state affects the overall process states transition.

9. Suppose that a disk drive has 5000 cylinders, numbered 0 to 4999. The drive is currently serving a request at cylinder 142, and the previous request was at cylinder 125. The queue of pending requests, in FIFO order, is 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130.Starting from the current head position, Compare the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests, for SSTF,C-SCAN and LOOK disk scheduling algorithms?