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1. a) What is an operating system? Explain the main purpose of an operating system. 5

b) What is a thread? Write the difference between process and thread. 5

c) What are the advantages of a multiprocessor system? 3

d) What is real time systems? 1

2. a) What is kernel? Describe the objective of multiprogramming. 3

b) Write some benefits of multithreaded programming. 3

c) What is process? Give an example of a process state. 5

d) What is multitasking? Write the purpose of an I∕O status information? 3

3. a) Enumerate the different RAID levels. 4

b) What is GUI? Differentiate internal commands from external commands. 4

c) How does dynamic loading aid in better memory space utilization? 3

d) What is thrashing? When does thrashing occur? 3

4. a) What is LINUX? What is the difference between UNIX and LINUX? 4

b) What are the primary functions of VFS? 3

c) Explain the purpose of using a LIBAIO package in UBUNTU? 4

d) What is demand paging? Write the basic function of paging? 3

5. a) Write down the advantages and disadvantages of FCFS scheduling. 4

b) What is fragmentation? Define internal and external fragmentation. 3

c) What is SSH? Write the difference between paging and segmentation. 5

d) Describe how time quantum affect the round robin algorithm. 2

6. a) Explain the methods to prevent deadlock. 3

b) Explain process creation using the fork() system cells. 4

c) Calculate average waiting time for this process 7

PID: P1 P2 P3 P4 P5 and Burst time: 6 5 3 2 7

7. a) Define throughput and turnaround times. 4

b) Explain contagious memory location. 4

c) List the page replacement algorithms. If the page reference string is: 6

3,7,3,4,5,6,9,2,1,5,6,4,3,3,8,9,0

Then find out which one of the algorithms will have less page faults.

8. a) What is Resource Allocation Graph? Let there are sets P, R, E where P stands for 6

process, R stands for resource and E stands for edges.

P= {P1, P2, P3}, R={R1, R2, R3, R4}, E={P1→R1, P2→R3, R1→P2, R2→P2, R2→P1, R3→P3}.

According to the above given information, create a Resource Allocation Graph.

b) Suppose that a disk drive has 5000 cylinders, numbered 0 to 4999. The drive is currently 8

serving a request at cylinder 143 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, what is the total distance that the disk arm

moves to satisfy all the pending requests for LOOK, C-LOOK, SCAN, C-SCAN?