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10CS53

Fifth Semester B.E. Degree Examination, Dec.2018/Jan. 2019
Operating System

Time: 3 hrs.

Max. Marks:100

Note: Answer FIVE full questions, selecting atleast TWO questions from each part.

PART - A

- 1 a. Define operating system. Explain different views of operating system. (08 Marks)
b. What are virtual machines? Explain VM-WARE architectures with neat diagram. (08 Marks)
c. Explain process management activities. (04 Marks)
2 a. With neat diagram explain different states of a process. (05 Marks)
b. Discuss scheduling criteria used in operating system. (05 Marks)
c. For the following example calculate average waiting time and average turnaround time using FCFS, pre-emptive SJF, and RR[1 time unit] CPU scheduling algorithms.

Table with 3 columns: Jobs, Arrival-Time, Burst-time. Rows: P1, P2, P3, P4

(10 Marks)

- 3 a. What is critical section problem? Explain semaphore solution to critical section problem. (07 Marks)
b. Describe the monitor solution to the classical dining philosopher problem. (08 Marks)
c. Define race condition. Explain readers writer problem with semaphore in detail. (05 Marks)
4 a. What is deadlock? What are necessary conditions on operating system must satisfy for a deadlock to occur? (06 Marks)
b. For the following snapshot find the safe sequence using Banker's algorithm.

Table for Banker's algorithm with columns: Process, Allocation (A, B, C), Max (A, B, C), Available (A, B, C). Rows: P0, P1, P2, P3, P4

- i) Is the system in safe state?
ii) If a request from process P2 arrives for (0, 0, 2) can the request be granted? (09 Marks)
c. How is system recovered from deadlock? (05 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.



PART - B

- 5 a. What are translation look aside buffer (TLB)? Explain in detail with a simple paging system with a neat diagram. (08 Marks)
- b. Given the memory partitions of 100k, 500k, 200k, 300k and 600k. Apply first fit and best fit algorithm to place 212k, 417k, 112k, 426k processes respectively. (04 Marks)
- c. Consider the following page replacement string 10710212303240362107 for a memory with 3 frames. How many page faults occur for LRU and FIFO page replacement algorithms? Which is the efficient among both? (08 Marks)
- 6 a. Explain how free space is managed. (04 Marks)
- b. Explain the different file access methods. (06 Marks)
- c. What is a file? Explain different allocation methods. (10 Marks)
- 7 a. Describe the access matrix model used for protection purpose. (08 Marks)
- b. Suppose the position of cylinder is at 53. The disk drive has cylinders numbered from 0 to 199. The queue of parading request in FIFO order is : 98, 183, 37, 122, 14 124, 65, 67. Starting from the current head position what is the total distance travelled (in cylinders) by the disk arm to satisfy the requests using algorithm : i) FCFS ii) SSTF iii) SCDN and iv) Look. Illustrate with figures in lack case. (12 Marks)
- 8 a. Explain the different system components of Linux OS. (10 Marks)
- b. Discuss the interprocess communication facility in UNIX operating system. (10 Marks)
