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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.

Jobs	Arrival-Time	Burst-time
P1	0	8
P2	1	4
P3	2	9
P4	3	5

(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.

Process	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P ₀	0	0	2	0	0	4	1	0	2
P ₁	1	0	0	2	0	1			
P ₂	1	3	5	1	3	7			
P ₃	6	3	2	8	4	2			
P ₄	1	4	3	1	5	7			

- 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)

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)
