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10CS53

Fifth Semester B.E. Degree Examination, May 2017
Operating Systems

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. Explain the advantages of layered approach, with a diagram. **(06 Marks)**

b. Write the system call sequence to copy a file from source to destination. **(07 Marks)**

c. With a neat diagram, explain the concept of virtual machines. **(07 Marks)**

2 a. Explain the process states with diagram. **(06 Marks)**

b. Explain the different multithreading models, with neat sketches. **(06 Marks)**

c. Consider the following set of processes. Draw Gantt charts and calculate average waiting time and average turnaround time using non-preemptive SJF and preemptive SJF scheduling algorithms. **(08 Marks)**

Process	Arrival time (ms)	Burst time (ms)
P_1	0	8
P_2	1	4
P_3	2	9
P_4	3	5

3 a. Explain the critical section problem. List and explain the requirements to be met by a solution to critical section problem. **(08 Marks)**

b. Describe the monitor solution to the classical dining-philosopher's problem. **(08 Marks)**

c. What do you mean by a binary semaphore and a counting semaphore? **(04 Marks)**

4 a. What is deadlock? Explain the necessary conditions for its occurrence. **(06 Marks)**

b. System consists of five jobs (J_1, J_2, J_3, J_4, J_5) and three resources (R_1, R_2, R_3), Resource type R_1 has 10 instances, resource type R_2 has 5 instances and R_3 has 7 instances. The following snapshot of the system has been taken:

Jobs	Allocation			Maximum			Available		
	R_1	R_2	R_3	R_1	R_2	R_3	R_1	R_2	R_3
J_1	0	1	0	7	5	3	3	3	2
J_2	2	0	0	3	2	2			
J_3	3	0	1	9	0	2			
J_4	2	1	1	2	2	2			
J_5	0	0	2	4	3	3			

(08 Marks)

c. Describe RAG:

i) With deadlock

ii) With a cycle but no deadlock. **(06 Marks)**

PART – B

5 a. Explain internal and external Fragmentation with examples. **(06 Marks)**

b. Explain with a diagram, how TLB is used to solve the problem of simple paging scheme. **(08 Marks)**

c. What is the cause of threshing? How does the system detect thrashing? **(06 Marks)**

6 a. What is a file? Explain the different allocation methods. **(10 Marks)**

b. Explain different approaches to managing free space on disk storage. **(10 Marks)**

7 a. What is disk scheduling? Explain the following with diagram: i) FCFS; ii) SSTF; iii) SCAN. **(10 Marks)**

b. What is an access matrix? Explain the following operations in access matrix with an example for each: i) Copy; ii) Transfer; iii) Limited copy. **(10 Marks)**

8 a. Explain the different components of a Linux system. **(10 Marks)**

b. Discuss how memory management is dealt with in Linux operating system. **(10 Marks)**

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