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By K B Hemanth Raj

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CRASH COURSE

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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 (J₁, J₂, J₃, J₄, J₅) and three resources (R₁, R₂, R₃), Resource type R₁ has 10 instances, resource type R₂ has 5 instances and R₃ 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			

- c. Describe RAG:
 - i) With deadlock (08 Marks)
 - ii) With a cycle but no deadlock. (06 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. 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 thrashing? 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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