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10CS53

Fifth Semester B.E. Degree Examination, Dec.2013/Jan.2014
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 advantage of the layered approach with a neat diagram. **(06 Marks)**

b. What are virtual machines? Explain its advantage with a neat diagram. **(08 Marks)**

c. What are the essential properties of batch, real time and distributed operating systems? **(06 Marks)**

2 a. Differentiate between:
i) Process and a thread.
ii) Short term and medium term schedules.
iii) User level and kernel level threads.
iv) Waiting and turn around time. **(08 Marks)**

b. Consider the following set of processes with arrival time:

Process	Burst time	Arrival time
P_1	10	0
P_2	1	0
P_3	2	1
P_4	4	2
P_5	3	2

i) Draw Gantt charts using FCFS, SJF preemptive and non preemptive scheduling.
ii) Calculate the average waiting time for each of the scheduling algorithm. **(08 Marks)**

c. Describe the actions an operating system takes to context switch between processes. **(04 Marks)**

3 a. Explain Dining-Philosopher's problem using monitors. **(10 Marks)**

b. What is race condition? Explain Reader's writer's problem with semaphores. **(10 Marks)**

4 a. For the following snapshot find the safe sequence using Banker's algorithm:
The number of resource units are R_1, R_2, R_3 which are 7, 7, 10 respectively.

Process	Allocated resources			Maximum requirements		
	R_1	R_2	R_3			
P_1	2	2	3	3	6	8
P_2	2	0	3	4	3	3
P_3	1	2	4	3	4	4

(06 Marks)

b. Explain different methods to recover from deadlock. **(06 Marks)**

c. Dead lock exists if a cycle exists. Yes or no. Justify your answer with a suitable example. **(08 Marks)**

PART – B

5 a. Why are translation loan-aside bubbles (TLB) important? In a simple paging system, what information is stored in TLB? Explain. **(08 Marks)**

b. Given memory partitions of 100K, 500K, 200K, 300K and 600K, apply first fit and best fit algorithm to place 212K, 417K, 112K and 426K. **(04 Marks)**

c. What is swapping? Does this increase the operating systems overhead? Justify your answer. **(08 Marks)**

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

b. What are directories? Write a brief note on mounting file systems. **(05 Marks)**

c. How is free space managed? Explain. **(05 Marks)**

7 a. Explain the difference between protection and security? Describe the scheme of capability lists to implement protection. **(10 Marks)**

b. Write short notes on:

i) Swap space management.

ii) Revocation of access rights. **(10 Marks)**

8 a. What are the design principles of Linux operating systems? Explain. **(08 Marks)**

b. What do you mean by cloning? How is it achieved in Linux systems? **(06 Marks)**

c. How is IPC handled in Linux? Explain with a suitable example. **(06 Marks)**

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