SSN COLLEGE OF ENGINEERING, KALAVAKKAM – 603 110
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
B.E. Computer Science and Engineering
CS6801 MULTICORE ARCHITECTURES & PROGRAMMING

Date: 13-2-2017, 8.00-9.30 AM UNIT TEST – 2 Answer key Max. Marks: 50
Academic Year: 2016-2017 EVEN Batch: 2013-2017
Semester: 8 Faculty: Dr.DVVPrasad / K.Lekshmi

Qn. No	Part - A	Marks	(KL,COn)
1.	List the requirements of mutual exclusion? Ans: a)Mutual exclusion must be enforced. Only one process at a time is allowed in its critical section. b) A process that halts in its non critical section must do without interfering with other processes. c) It must not be possible for a process requiring access to critical section to be delayed indefinitely: No deadlock or starvation d) When a process is in its critical section, any process that requests entry to its critical section must be permitted to enter without delay. e) No assumptions are made about relative process speed or no. Of processors. f) A process remains in its critical section for a finite time only.	2	K1,CO2

2.	Consider the following code fragment
	acquire(s1),
	a++;
	acquire(s2);
	v++;
	release(s2);
	release(s1);
	s1 ,s2 are the semaphores. All variables are atomic. Now consider two threads running this fragment of code simultaneously. Can there be a deadlock?
	Ans: Both the semaphores will be acquired in the same order by both threads. Since this is a linear order there can be no situation when a deadlock could occur.
		2	K3,CO2

3.	What are the three conditions for the deadlock to occur? Ans: • Mutual exclusion : Only one process can use the resource e at a time • Hold and Wait : A process may hold allocated resources while awaiting assignment of others. • No Preemption : No resource can be forcibly removed from a process holding it.	2	K2,CO2
4.	What is the difference between strong and weak semaphore ? Strong semaphore requires that processes that are blocked on that semaphore are unblocked using FIFO policy. Weak Semaphore doesn't dictate the order in which the blocked	2	K2,CO2

processes are unblocked.

5. Define Amdahl's law. 2 K1,CO2
Ans: $Speedup_{overall} = 1 / (1-Fraction_{Enhanced}) + Fraction_{Enhanced}/Speedup_{Enhanced}$

Part – B Answer all questions (16+16+8)

6. Explain the impact of program and data structures on performance of a system. 16 K2,CO2
Ans: Refer Standard book

OR

7. Write a note on scalability issues in performance of a system. 16 K1,CO2
Ans: Refer Standard book

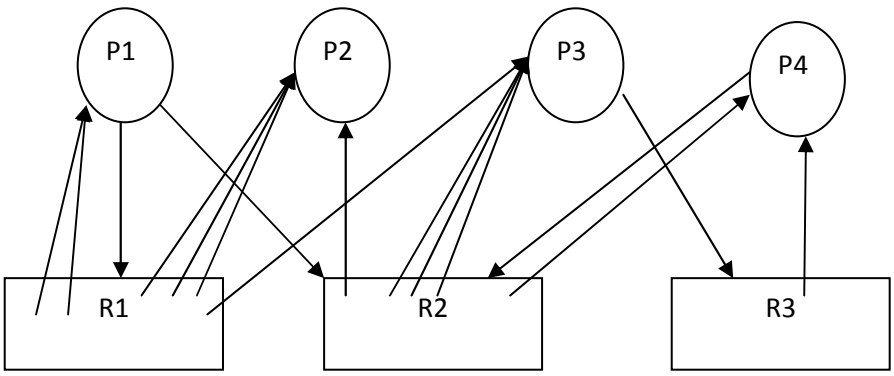
8. Explain the various Synchronization Primitives 16 K1,CO2
Ans: Refer Standard book

OR

9. Explain the different ways of communication between threads and processes. 16 K2,CO2
Ans: Refer Standard book

10. Given the process resource usage and availability as shown in the table below. Draw the resource allocation graph. 8 K3,CO2
Ans: Refer Standard book

Process	Hold Resources			Outstanding Requests			Resources Available		
	R1	R2	R3	R1	R2	R3	R1	R2	R3
P1	2	0	0	1	1	0	0	0	0
P2	3	1	0	0	0	0			
P3	1	3	0	0	0	1			
P4	0	1	1	0	1	0			



OR

11. Write a note on Data Races. 8 K1,CO2