

VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY

(An Autonomous Institution, Affiliated to Anna University, Chennai)

Semester Examinations – April / May 2017

Regulations-2016

Programme: ME- CSE Semester: 2 Max. Marks: 100 Duration 3 Hrs

Course Code & Title: **16CPT22 ADVANCED OPERATING SYSTEMS**

Knowledge Levels (KL)	K1 - Remembering K2 - Understanding	K3 - Applying K4 – Analyzing	K5 – Evaluating K6 – Creating
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Part A - Answer ALL Questions.

10 x 2 = 20 Marks

No	Question	KL
1.	Why dining philosophers’ problem is considered a classic synchronization problem?	K4
2.	Mention the ways to deal with deadlock problem.	K2
3.	Compare internal fragmentation with external fragmentation.	K4
4.	What are the advantages and disadvantages of linked allocation?	K2
5.	State the design issues in Remote Procedure Call.	K2
6.	Write the difference between token based and non-token based algorithms.	K2
7.	Outline the issues that a cache consistency scheme needs to address.	K4
8.	List the different forms of memory coherence.	K2
9.	Which types of services are provided by Distributed File System?	K2
10.	What key decisions are to be made in file-caching scheme for distributed systems?	K2

Part B - Answer ALL Questions.

5 x 13 = 65 Marks

No	Question	Marks	KL
11.	a Explain the two models of Inter Process Communication.	13	K2
OR			
	b i. Assume that a system has multiple processing cores. For each of the following scenarios, describe which is a better locking mechanism— a spinlock or a mutex lock where waiting processes sleep while waiting for the lock to become available:	7	K4
	• The lock is to be held for a short duration.		
	• The lock is to be held for a long duration.		
	• A thread may be put to sleep while holding the lock.		
	ii. List and discuss three examples of deadlocks that are not related to a computer system environment.	6	K3
12.	a i. Compare paging with segmentation with respect to how much memory the address translation structures require to convert virtual addresses to physical addresses.	5	K5
	ii. Explain Optimal and FIFO Page Replacement algorithms with suitable examples.	8	K2
OR			
	b Discuss the various schemes for defining the logical structure of a directory.	13	K2

13. a i. Present a performance comparison among different token based algorithms. 10 K5
- ii. State logical and vector clock. 3 K2
- OR
- b i. Show that Byzantine agreement cannot always be reached among four processors if two processors are faulty. 6 K5
- ii. Discuss about distributed deadlock detection algorithms. 7 K2
14. a i. Illustrate the different design issues in distributed file systems. 6 K2
- ii. Explain the read-replication and full-replication algorithms to implement Distributed Shared Memory. 7 K2
- OR
- b i. Describe any two coherence protocols in detail. 8 K2
- ii. Explain the two important issues to be considered in the design of a DSM system. 5 K2
15. a i. Discuss the need for distributed file system with its desirable features. 10 K2
- ii. State the different file accessing models. 3 K2
- OR
- b i. How will you improve the availability of files in a distributed file system? Explain. 6 K3
- ii. Discuss about fault tolerance in distributed file system. 7 K2

Part-C

1 x 15 = 15 Marks

16. a i. Suppose that the following processes arrive for execution at the times indicated. Each process will run for the amount of time listed. In answering the questions, use non preemptive scheduling, and base all decisions on the information you have at the time the decision must be made. 8 K3

Process	Arrival Time	Burst Time
P1	0.0	8
P2	0.4	4
P3	1.0	1

- a. What is the average turnaround time for these processes with the FCFS scheduling algorithm?
- b. What is the average turnaround time for these processes with the SJF scheduling algorithm?
- ii. Illustrate a classic software-based solution to the critical section problem. 7 K2

OR

- b i. Discuss the situations in which the Least Frequently Used (LFU) page replacement algorithm generates fewer page faults than the Least Recently Used (LRU) page-replacement algorithm. Also discuss under what circumstances the opposite holds. 5 K4
- ii. Compare the performance of various load distributing algorithms. 10 K4
