



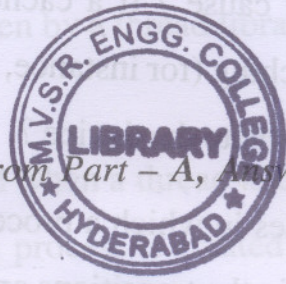
FACULTY OF INFORMATICS

B.E. 3/4 (IT) I Semester (Main) Examination, December 2010

OPERATING SYSTEMS

Time : 3 Hours]

[Max. Marks : 75



Note : Answer all questions from Part – A, Answer any five questions from Part – B.

PART – A

(10×2.5=25 Marks)

1. What is a thread ? What are the benefits of multithreading ?
2. What is demand paging ?
3. What are merits and demerits of multiprocessor systems ?
4. What is the advantage of lock-key mechanism for protection ?
5. Define monitor and state its limitations and advantages.
6. What are the two models of inter-process communication ? What are the strengths and weaknesses of the two approaches ?
7. What is the purpose of paging the page tables ?
8. What is Belady’s anomaly ? State the page replacement algorithms that suffer from Belady’s anomaly.
9. What are the properties of immutable files ?
10. Differentiate between C-SCAN and C-look disk scheduling algorithms.

PART – B

(5×10=50 Marks)

11. a) Give two reasons why caches are useful. What problems do they solve? What problems do they cause? If a cache can be made as large as the device for which it is caching (for instance, a cache as large as a disk), why not make it that and eliminate the device? 5
- b) Discuss the various states in which a process can exist. Draw the process state diagram and explain the transitions among the various states. 5
12. Consider the following snapshot of a system : 10

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2	1	5	2	0
P1	1	0	0	0	1	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	6	5	6				

Answer the following questions using the banker's algorithm :

- i) What is the content of the matrix *Need* ?
- ii) Is the system in a safe state ?
- iii) If a request from a process P1 arrives for (0, 4, 2, 0) can the request be granted immediately ?

13. Explain memory management with paging. Also, discuss any two techniques for structuring of Page Table. (5+5)
14. a) Describe the actions taken by a thread library to context switch between user level threads. [Max. Marks : 75] 5
- b) What resources are used when a thread is created ? How do they differ from those used when a process is created ? 5
15. Consider the following page reference string : (10x2.5=25 Marks) 10
- 1, 2, 3, 4, 5, 3, 4, 1, 6, 7, 8, 7, 8, 9, 7, 8, 9, 5, 4, 5, 4, 2. How many page faults would occur for the following page replacement algorithms, assuming three and four frames ? Assuming frames are initially empty.
- i) LRU page replacement
- ii) FIFO page replacement
- iii) Optimal page replacement
16. a) Discuss the advantages and disadvantages of associating with remote file systems (stored on file servers) a different set of failure semantics from that associated with local file systems. 5
- b) Compare and Contrast Tree-Structured and Acyclic-Graph Directories. 5
17. Discuss the various aspects of system protection and security. 10