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Question Paper Code : 21304

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2013.

Fourth Semester

Computer Science and Engineering

CS 2254/CS 45/CS 1253/10144 CS 405/080250012 — OPERATING SYSTEMS

(Common to Information Technology)

(Regulation 2008/2010)

(Common to PTCS 2254 – Operating Systems for B.E. (Part-Time) Fourth semester
CSE – Regulation 2009)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Mention the advantages in using multiprogramming systems.
2. What are the benefits of multithreads?
3. Define mutual exclusion.
4. Give the necessary conditions for deadlock to occur.
5. Consider a logical address space of eight pages of 1024 words each, mapped onto a physical memory of 32 frames. How many bits are there in the logical address and in the physical address.
6. What is meant by Belady's anomaly?
7. What are the responsibilities of File Manager?
8. Mention the two main approaches to identify and reuse free memory area in a heap.
9. Define rotational latency.
10. Write a brief note on RAID.

PART B -- (5 × 16 = 80 marks)

11. (a) (i) Discuss multiprocessor systems in detail. (8)
- (ii) Explain the purpose and importance of system calls in detail with examples. (8)

Or

- (b) Discuss how communication is done in client server systems using remote procedure calls and remote method invocation. (16)
12. (a) Discuss the different techniques used for evaluating CPU scheduling algorithms in detail. (16)

Or

- (b) (i) What is meant by critical section problem? Propose a solution based on bakery algorithm. (8)
- (ii) Consider the following snapshot of a system :

P0 – P4 are 5 processes present and A, B, C, D are the resources. The maximum need of a process and the allocated resources details are given in the table.

Answer the following based on banker's algorithm. Each subdivision carries two marks.

- (1) What is the content of NEED matrix? (2)
- (2) Is the system in a safe state? (3)
- (3) If a request from process P0 arrives for (0, 2, 0) can the request be granted immediately. (3)

	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P0	0	1	0	7	5	3	3	3	2
P1	2	0	0	3	2	2			
P2	3	0	2	9	0	2			
P3	2	1	1	2	2	2			
P4	0	0	2	4	3	3			

13. (a) (i) Explain the concept of paging in detail with necessary diagrams. (8)
(ii) Describe the hierarchical paging technique for structuring page tables. (8)

Or

- (b) (i) Consider the following page reference string :
2, 1, 0, 3, 4, 0, 0, 0, 2, 4, 2, 1, 0, 3, 2. How many page faults would occur if the working set policy were used with a window size of 4? Show when each page fault would occur clearly. (4)
(ii) What is meant by thrashing? Discuss in detail. (12)
14. (a) (i) Explain the different file access methods in detail. (8)
(ii) Describe the two level and acyclic graph schemes for defining the logical structure of a directory. (8)

Or

- (b) (i) Explain the linked list and indexed file allocation methods with neat diagrams. Mention their advantages and disadvantages. (8)
(ii) Discuss how free space is managed by operating system? (8)
15. (a) (i) Write a brief note on interrupts. (8)
(ii) Explain the special services provided by kernel I/O subsystem. (8)

Or

- (b) (i) Describe the different disk scheduling algorithms with examples. (10)
(ii) Write a brief note on RAID levels. (6)