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Question Paper Code : 80395

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Seventh Semester

Electrical and Electronics Engineering

CS 2411/CS 609/ 10144 CS 405 – OPERATING SYSTEMS

(Common to Electronics and Instrumentation Engineering and Instrumentation and Control Engineering)

(Regulations 2008/2010)

(Also common to PTCS 2411 for B.E. (Part-Time) Seventh Semester – CSE – Regulations 2009)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is medium term scheduling?
2. Why a thread is called as light weight process?
3. “Apparent concurrency increases the scheduling overhead without providing any speed up of an application program”. Comment on this statement.
4. A system has two processes and three identical resources. Each process needs a maximum of two resources. Is deadlock possible? Justify the answer.
5. Mention the use of Translation Look Aside buffer (TLB).
6. Brief the procedure for handling page fault.
7. List the file attributes.
8. Define seek time and rotational latency.
9. What are device drivers?
10. What is tertiary storage?

PART B — (5 × 16 = 80 marks)

11. (a) (i) How Virtual Machines are implemented? State the benefits of using Virtual Machines. (8)
- (ii) Write short notes on Process Control block. (8)

Or

- (b) Discuss the various methodologies used to logically implement Inter-Process Communication. (16)

12. (a) Consider the following set of processes, with the length of the CPU burst time given in milliseconds. All five processes arrive at time 0, in the order given.

Process	Burst Time
P1	10
P2	29
P3	03
P4	07
P5	12

- (i) Draw the Gantt chart illustrating the execution of these processes using FCFS, SJF and RR (quantum = 10 milliseconds) scheduling. (8)
- (ii) Calculate the average turn around time and average waiting time for each type of scheduling mentioned above. (8)

Or

- (b) (i) Define the critical section problem and discuss the three requirements that a solution to the critical section problem must satisfy. (8)
- (ii) Consider the following snapshot of a system. (8)

Process	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

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

13. (a) (i) Consider the page reference string: 1, 2, 3, 4, 2, 5, 3, 4, 2, 6, 7, 8, 7, 9, 7, 8, 2, 5, 4 and 9. How many page faults would occur for LRU, FIFO and Optimal page replacement algorithms when the number of frames is three? (12)
- (ii) What are the advantages and disadvantages of contiguous and non contiguous memory allocation? (4)

Or

- (b) (i) Describe the Linux memory management components in detail. (6)
- (ii) Explain how logical memory addresses are translated into physical memory address in segmented memory management system. (10)
14. (a) (i) Write a note on file system and its access methods. (10)
- (ii) Write a note on free space management. (6)

Or

- (b) Discuss file Allocation methods in detail. (16)
15. (a) Explain the types of I/O devices and its characteristics. Also explain the following concepts: buffering and caching in I/O subsystem. (16)

Or

- (b) None of the disc scheduling disciplines, except FCFS are truly fair. Why this assertion is true? Perform FCFS, SSTF, SCAN algorithms for the following set of request 10, 22, 20, 2, 40, 6, 38 and calculate the average seek time. Arm is initially at cylinder 20 and maximum numbers of cylinders are 50. (16)
