CBCS SCHEME

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15CS64

Sixth Semester B.E. Degree Examination, Dec.2018/Jan.2019
Operating Systems

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Distinguish between the following terms :
   i) Multiprogramming and multitasking
   ii) Multiprocessor systems and clustered systems. **(04 Marks)**

b. Analyze modular kernel approach with layered approach with a neat sketch. **(06 Marks)**

c. List and explain the services provided by OS for the user and efficient operation of system. **(06 Marks)**

OR

2 a. Illustrate with a neat sketch, the process states and process control block. **(08 Marks)**

b. Discuss the methods to implement message passing IPC in detail. **(08 Marks)**

Module-2

3 a. Discuss the benefits of multithreaded programming. **(04 Marks)**

b. Consider the following set of processes with CPU burst time (in ms).

Process	Arrival time	Bunt time
P1	0	6
P2	1	3
P3	2	1
P4	3	4

Compute the waiting time and average turnaround time for the above process using FCFS, SRT and RR (time quantum = 2ms) scheduling algorithm. **(12 Marks)**

OR

4 a. Illustrate with examples the Peterson's solution for critical section problem and prove that the mutual exclusion property is preserved. **(08 Marks)**

b. Show how semaphore provides solution to reader writers problem. **(08 Marks)**

Module-3

5 a. Define deadlock. Write short notes on 4 necessary conditions that arise deadlocks. **(06 Marks)**

b. Assume that there are 5 processes PO through P4 and 4 types of resources. At time T_0 we have the following state :

Process	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P_0	0	0	1	2	0	0	1	2	1	5	2	0
P_1	1	0	0	0	1	7	5	0				
P_2	1	3	5	4	2	3	5	6				
P_3	0	6	3	2	0	6	5	2				
P_4	0	0	1	4	0	6	5	6				

Apply Banker's algorithm to answer the following :

i) What is the content of need matrix?

ii) Is the system in a safe state?

iii) If a request from a process P1(0, 4, 2, 0) arrives, can it be granted? **(10 Marks)**

OR

6 a. Write short notes on :

i) External and internal fragmentation

ii) Dynamic loading and linking. **(04 Marks)**

b. Analyze the problem in simple paging technique and show how TLB is used to solve the problem. **(08 Marks)**

c. Given the memory partitions of 200k, 700k 500k, 300k, 100k, 400k. Apply first fit and best fit to place 315k, 427k, 250k, 550k. **(04 Marks)**

Module-4

7 a. For the following page reference string 1, 2, 3, 4, 1, 2, 5, 1, 2, 3, 4, 5. Calculate the page faults using FIFO and LRU for memory with 3 and 4 frames. **(08 Marks)**

b. Explain demand paging in detail. **(08 Marks)**

OR

8 a. What do you mean by free space list? With suitable example, explain any 3 methods of free space list implementation. **(08 Marks)**

b. Write short notes on linked and indexed allocation method with a neat diagram. **(08 Marks)**

Module-5

9 a. Given the following sequences 95, 180, 34, 119, 11, 123, 62, 64 with the head initially at track 50 and ending at track 199. What is the total disk traveled by the disk arm to satisfy the request using FCFS, SSTF, LOOK and CLOOK algorithm. **(12 Marks)**

b. Write short notes on access matrix and its implementations. **(04 Marks)**

OR

10 a. Explain the components of Linux system with a neat diagram. **(08 Marks)**

b. Describe briefly on Linux Kernel modules. **(08 Marks)**

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