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15CS64

Sixth Semester B.E. Degree Examination, Jan./Feb. 2021
Operating Systems

Time: 3 hrs. Max. Marks: 80

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

Module-1

1 a. Define operating system. Discuss the services provided by operating system form user point of view and system point of view (services helpful to user and system). **(06 Marks)**

b. Define system call. Explain various types of system call. **(06 Marks)**

c. Compare the advantages and disadvantages of simple structured operating system with layered approach. **(04 Marks)**

OR

2 a. Define process. Explain different states of process with state diagram indicating the conditions for process to shift from one state to another. **(04 Marks)**

b. Define scheduler. Explain the different types of schedulers. **(06 Marks)**

c. Describe the implementation of IPC using shared memory with producer consumer problem. **(06 Marks)**

Module-2

3 a. State the need and benefits of multipthreading. Explain the different mutlithreaded models. **(05 Marks)**

b. Consider the following set of processes :

Process	Burst Time	Arrival Time	Priority
P_1	10	0	2
P_2	5	2	1
P_3	2	3	0
P_4	20	5	3

Draw Gantt chart and calculate AWT, (Average Waiting Time) and ATT (Average Turnaround Time) using.

i) Non preemptive and pre-emptive SJF

ii) Round Robin with TQ = 5msec. **(06 Marks)**

c. Explain multiple processor scheduling. **(05 Marks)**

OR

4 a. State the requirements of critical section problem. Explain how Perterson's solution satisfies the above requirements with suitable code. **(08 Marks)**

b. Define semaphore. Explain how synchronization is achieved using semaphore in reader writer's synchronization problem. **(08 Marks)**

Module-3

5 a. What is deadlock? Explain the necessary conditions for the occurrence of deadlock. **(04 Marks)**

b. Explain the Banker's algorithm for deadlock avoidance. **(06 Marks)**

c. Consider the following snapshot of sysyem :

Process	Alloc				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				

i) What is the content of need matrix

ii) Is system in safe state?

iii) If request from process P_1 arrives for (0 4 2 0) can the request be granted immediately? **(06 Marks)**

OR

6 a. Explain paging with TLB with neat diagram. **(04 Marks)**

b. List out contiguous memory allocation strategies. Give the memory partition of 100K, 500K, 200K, 300K and 600K how would each of allocation alg, place processes of 212K, 417K, 112K and 426K (in order). Which alg, makes most efficient use of memory? **(06 Marks)**

c. Explain the following : i) Segmentation ii) Inverted page table. **(06 Marks)**

Module-4

7 a. Define page fault. Explain the steps involved in handling page fault with neat diagram. **(06 Marks)**

b. Consider the following reference string 1 2 3 4 2 1 5 6 2 1 2 3 7 6 3 2 1 2 3 6 for frame size of three. Find the number of page faults using FIFO, optimal, LRU. Which one is most efficient? **(06 Marks)**

c. Describe the working set model. **(04 Marks)**

OR

8 a. Explain the various methods of accessing a file. **(05 Marks)**

b. Define directory. Explain the various directory structures. **(06 Marks)**

c. Explain the methods of keeping track of free space on disk. **(05 Marks)**

Module-5

9 a. Explain SSTF, SCAN, C – SCAN disk scheduling algorithm. **(08 Marks)**

b. Explain access matrix model used for protection in a commuter system. **(08 Marks)**

OR

10 a. With neat diagram, explain in detail components of LINUX system. **(08 Marks)**

b. Explain in detail the different IPC mechanism available in LINUX. **(08 Marks)**

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