8/12/23

Total number of printed pages: 2

UG/5th/UCSE502

2023

Operating Systems

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1. Answer briefly: 5x4=20

   a) What is a race condition? Explain with the help of spooler directory concept.

   b) What is a critical section? State the four different conditions to achieved mutual exclusion.

   c) What is producer-Consumer problem? Write the appropriate code segment for producer and consumer using Sleep and Wakeup system call.

   d) What is message passing approach for inter process communication? Discuss the various design issues of message passing approach.

2. a) What is an operating System? Explain how operating system act as resource manager. 10

   b) What is inter process communication? Illustrate any one classical inter process communication problem. 10

3. a) Suppose that the following processes arrive for execution at the time indicated: 15

Process	Arrival Time	Burst Time
P1	0	10
P2	1	2
P3	2	3
P4	3	1
P5	4	5

Draw the Gantt Chart and calculate the average waiting time and turnaround time for these processes with? (Time quantum = 2)

i. FCFS scheduling algorithm

ii. SJF scheduling algorithm

iii. Round Robin scheduling algorithm

b) Explain process hierarchies in the light of GNU/ Linux operating system. 5

4. a) Compare and contrast the following resource allocation policies: 15

i. All resources request together

ii. Allocation using global numbering

iii. Allocation using Banker's algorithm

b) What is deadlock? Write the necessary conditions that cause deadlock situation to occur. 5

5. a) Why should page replacement be performed? Compare FIFO, optimal and LRU page replacement algorithm with an example of your choice. 10

b) What is the use of system call? Write the functions and syntax of any five system calls. 10

6. a) Write short notes (any four) 5x4=20

i. Process Vs. Thread

ii. Thread Scheduling

iii. Priority Scheduling

iv. Readers and Writers problem

v. Process Control Block