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15CS64

Sixth Semester B.E. Degree Examination, July/August 2021
Operating Systems

Time: 3 hrs.   Max. Marks: 80

Note: Answer any FIVE full questions.

1 a. Explain the following:
   (i) User and system view of OS
   (ii) Dual mode operations of OS   **(08 Marks)**
   b. What are virtual machines? Explain virtual machines with neat diagram. Also point out its benefits.   **(08 Marks)**

2 a. Explain process with state transition diagram and also explain PCB with neat diagram.
                                                                                  (08 Marks)
   b. List and explain two major models for Inter Process Communication (IPC).   **(08 Marks)**

3 a. List and explain different type of multithreading models. Point out the advantages of Multithreaded Programming.   **(08 Marks)**
   b. Consider the following set of process with Burst time. Assume all the process arrive at time 0 ms.

Process	Burst time in (ms)
P1	21
P2	03
P3	06
P4	02

   Draw Gantt chart and calculate the Average Waiting time and Average Turnaround time using FCFS and RR algorithm with time quantum 05 ms.   **(08 Marks)**

4 a. Briefly explain about:
   (i) Critical section problem
   (ii) Peterson's solution   **(08 Marks)**
   b. What are semaphores? Explain Bounded Buffer Problem with semaphore.   **(08 Marks)**

5 a. What is Deadlock? What are the necessary conditions that must satisfy for deadlock to occur? Explain Deadlock using RAG.   **(08 Marks)**
   b. For the following given snapshot, using Banker's algorithm. Find:
   (i) Need matrix
   (ii) Safe sequences of process

Process	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			

                                                                                  (08 Marks)

6 a. What is Paging? Explain Paging with neat diagram.   (08 Marks)
    b. Explain segmentation with neat diagram.   (08 Marks)

7 a. Consider the following page reference string:
      7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1
      For a memory with Three (3) Frames. How many page faults will occur using LRU and
      FIFO page replacement algorithm?   (08 Marks)
    b. What is File? List and explain different attributes and operations of a File.   (08 Marks)

8 a. List and explain different allocation methods used for a file.   (08 Marks)
    b. Explain different Free-space Management techniques related to disk.   (08 Marks)

9 a. Briefly explain different disk scheduling techniques.   (08 Marks)
    b. What is protection? Distinguish between Mechanism and Policies. Briefly explain Access
      Matrix and its implementation.   (08 Marks)

10 a. Explain the different IPC mechanism available in Linux.   (08 Marks)
     b. With a neat diagram, explain in detail about components of a Linux system.   (08 Marks)

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