2015

COMPUTER SCIENCE & TECHNOLOGY

Paper : 1.3/403

OPERATING SYSTEMS

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Answer ALL questions from the following

(question carries ONE mark each.): 1×10=10

i. What are Time sharing systems

ii. Define Operating System?

iii. Define Dispatch Latency.

iv. Why it is important for the scheduler to distinguish I/O bound programs and CPU bound programs.

v. Define caching.

vi. What is semaphore?

vii. Which of these scheduling algorithms could result in Starvation.: FCFS, SJF, Priority and RR.

viii. What is Multitasking?

ix. Define a Thread?

x. What is a kernel?

2. **Answer ALL questions from the following**

(question carries TWO marks each.): 2×5=10

i. Describe process control block?

ii. Explain critical section problem?

iii. What is demand paging?

iv. What is virtual memory?

v. What are the necessary conditions for deadlock to arise?

3. **Answer ALL questions from the following**

(question carries FIVE marks each.): 5X4=20

i. Describe Segmentation.

ii. Explain Priority Scheduling, with example.

iii. Describe Resource Allocation Graph.

iv. Describe the methods for Recovery from a Deadlock.

Answer any FOUR questions from the following

(question carries TEN marks each.): 10X4=40

4. Describe Banker's Algorithm.

5. Suppose the following processes arrive for execution at the times indicated. Each will run the listed amount of time. Draw the Gantt Chart and find:

Process	Arrival Time	Burst Time
P1	0	6
P2	1	4
P3	2	7
P4	3	5

i) Find the turnaround time for each of these processes when FCFS scheduling algorithm is applied?

ii) Find the average waiting time for these processes using SJF scheduling algorithm(preemptive)?

iii) Compute what the average waiting time will be if the CPU is left idle for the first 1 unit and then preemptive SJF scheduling algorithm is used.

6. Suppose that a Disk drive has 5000 cylinders, numbered 0 to 4999, the drive is currently serving a request at 143. The queue of pending requests in FIFO order is: 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130

   Starting from the current head position , draw the graph and find out the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests for each of the following disk scheduling algorithms?

   i. FCFS ii. SSTF

   iii. SCAN iv. C-SCAN

7. Define Job Queue, Ready Queue and Device Queue. Draw the queuing diagram representation of Process scheduling. Define schedulers? Explain the different type of schedulers.

8. Explain Deadlock Detection.

9. Explain Optimal Page Replacement Algorithm and Least Recently Used Optimal Page Replacement Algorithm, with an example and write the number of Page Faults for each of them

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