P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)
Fourth Semester, B.E. - Information Science and Engineering
Semester End Examination; May/June - 2019
Operating System

Time: 3 hrs   *Max. Marks: 100*

Note: Answer **FIVE** full questions, selecting **ONE** full question from each unit.

UNIT - I

1 a. Explain computer system organization interms of computer system operation and storage structure. | 10

 b. What are the activities for which the operating system responsible for,

 i) Process management   ii) File management | 10

2 a. List and explain services provided by an operating system. | 10

 b. Explain the state diagram of a process and PCB. | 10

UNIT - II

3 a. Consider the following set of processes :

Process	Arrival time	Burst time
P_1	0	1
P_2	1	9
P_3	2	1
P_4	3	9

17

 i) Draw the Gantt chart showing the execution of these processes using FCFS, preemptive SJF, Non-Preemptive SJF and RR (Quantum-1) scheduling schemes

 ii) Compute the turnaround time and waiting time for each of the schemes above

 iii) Compute the average turnaround time and average waiting time in each scheme and thus find the best scheme in this particular case

 b. Describe the various scheduling criteria used in CPU scheduling. | 3

4 a. What are the three requirements to be met by a solution to the critical section problem? Explain Peterson solution. | 10

 b. Explain Semaphore. Write and explain Signal( ) and Wait( ) function. | 10

UNIT - III

5 a. Consider the following snapshot of a system. Answer the following questions using Banker's algorithm;

 i) What is the content of the matrix need?

 ii) Is the system in a safe state | 12

 iii) If a request from process P_1 arrives for (0, 4, 2, 0) can the request be granted immediately

	Allocation				Maximum				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				

b. Explain the necessary conditions used for deadlocks.   8

6 a. Describe TLB. Explain how it improves memory access time with a neat sketch?   10

b. Explain the hardware required to support the segmentation with neat schematic representation.   10

UNIT - IV

7 a. Consider the following page reference. Indicate page faults and calculate total number of page faults for optimal and LRU. Total number of available frames is 4. The reference is :   10

   1, 2, 3, 2, 5, 6, 3, 4, 6, 3, 7, 3, 1, 5, 3, 6, 3, 4, 2, 4, 3, 4, 5, 1

b. Explain the steps involved in handling the page fault with a diagram.   10

8 a. Explain different file operations.   10

b. Explain different types of directory structures.   10

UNIT - V

9 a. A drive has 5000 cylinders numbered 0 to 4999, the drive is currently serving a request at cylinder 143 and a previous request was at cylinder 125. The Queue of pending request in FIFO order is 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130. Starting from the current head position, what is the total distance travelled by the disk arm to satisfy the requests using algorithms FCFS, SSTF, SCAN, LOOK, C-SCAN. Illustrate with figure in each case.   15

b. Explain bad blocks or disks.   5

10 a. Explain the access matrix model of implementing protection in OS.   10

b. Explain the need of revoke access rights and different methods to implement revocation for capabilities.   10

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