TIT-501 1161

Odd Semester Examination 2018-19

B. TECH. (IT) (SEMESTER-V)

OPERATING SYSTEM

Time: 03:00 Hours **Max Marks : 100**

SECTION A

Note: Attempt **any four**. All question carry equal marks. [4x5 = 20]

1. Define the following terms:
   (a) Process
   (b) CPU Scheduling
   (c) disk scheduling algorithms
   (d) binary semaphore
   (e) Buffer cache

SECTION B

Note: Attempt **any four**. All question carry equal marks. [4x5 = 20]

1. Differentiate between macros and subroutines.
2. What is blocking and non blocking I/O
3. What is a semaphore? Explain busy waiting semaphores.
4. Define deadlock? Explain the necessary conditions for deadlock to occur.
5. Explain the disk scheduling algorithms in detail with diagrams.

SECTION C

Note: Attempt **any four**. All question carry equal marks. [4x5 = 20]

1. Compare flat and hierarchical directory structure.
2. Explain advantage of contiguous allocation over linked allocation.
3. Discuss paging and fragmentation problem in paging.
4. What do you mean by virtual memory? Discuss
5. Describe the following:
   (a) FIFO page replacement algorithm
   (b) LRU page replacement algorithm.

SECTION D

Note: Attempt **any two**. All question carry equal marks) [2x10= 20]

1. What are interrupts? How are they handled by the operating system?
2. 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. How many page fault would occur for the Optimal replacement algorithm, assuming three and four frames.
3. Consider the following page reference string: 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6.

   How many page faults would occur for the following replacement algorithms, assuming one, two, three, four, five? Remember all frames are initially empty, so your first unique pages will all cost one fault each. (i) LRU replacement (ii) FIFO replacement (iii) Optimal replacement

SECTION E

Note: Attempt **any two.** All question carry equal marks) [2x10= 20]

1. Given five memory partitions of 200Kb, 450Kb, 100Kb, 300Kb, 500Kb (in order), how would the first-fit, best-fit, and worst-fit algorithms place processes of 312 Kb, 215 Kb, 132 Kb, and 455 Kb (in order)? Which algorithm makes the most efficient use of memory?

2. Consider the following system snapshot using data structures in the Banker's algorithm, with resources A, B, C, and D, and process P0 to P4:

	Max				Allocation				Need				Available			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
P0	6	0	1	2	4	0	0	1								
P1	1	7	5	0	1	1	0	0								
P2	2	3	5	6	1	2	5	4								
P3	1	6	5	3	0	6	3	3								
P4	1	6	5	6	0	2	1	2								
													3	2	1	1

Using Banker's algorithm, answer the following questions.

(a) How many resources of type A, B, C, and D are there? [2]

(b) What are the contents of the Need matrix? [3]

(c) Is the system in a safe state? Why [5]

3. On a disk with 1000 cylinders, numbers 0 to 999, compute the number of tracks the disk arm must move to satisfy all the requests in the disk queue. Assume the last request serviced was at track 345 and head is moving to track 0. The queue in FIFO order contains requests for the following tracks: 123, 874,692, 475, 105, 376. Perform the computation for the following disk scheduling algorithms. i. FIFO ii. SSTF iii. SCAN iv. LOOK

----- X -----