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Sub Code: RCS401
Roll No.

B.TECH
(SEM IV) THEORY EXAMINATION 2018-19
Operating System

Time: 3 Hours ***Total Marks: 70***

Note: **1.** Attempt all Sections. If require any missing data; then choose suitably.
2. Any special paper specific instruction.

SECTION A

1. Attempt *all* questions in brief. **2 x 7 = 14**

a. Describe the typical elements of the process control block
b. What are the various scheduling criteria for CPU scheduling?
c. What is the main function of the memory-management unit?
d. Define seek time and latency time.
e. Define SCAN and C-SCAN scheduling algorithms.
1. What is a safe state and an unsafe state?
f. Explain the logical address space and physical address space diagrammatically.

SECTION B

2. Attempt any *three* of the following: **7 x 3 = 21**

a. Define Process. Explain various steps involved in change of a process state with neat transition diagram.
b. Explain Batch operating system with example.
c. What is a Critical Section problem? Give the conditions that a solution to the critical section problem must satisfy.
d. Illustrate the page-replacement algorithms
   (i) FIFO
   (ii) Optimal Page Replacement
   use the 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 frames.
e. A hard disk having 2000 cylinders, numbered from 0 to 1999. the drive is currently serving the request at cylinder 143,and the previous request was at cylinder 125.The status of the queue is as follows
   86, 1470, 913, 1774,948,1509,1022,1750,130
   What is the total distance (in cylinders) that the disk arm moves to satisfy the entire pending request for each of the following disk-scheduling algorithms?
   (i) SSTF
   (ii) FCFS

SECTION C

3. Attempt any *one* part of the following: **7 x 1 = 7**

(a) What is an Operating system? Describe the Operating-System Functions
(b) Write about monolithic kernel, layered, and microkernel structures of operating systems.

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4. Attempt any *one* part of the following: 7 x 1 = 7

(a) Explain what semaphores are, their usage, implementation given to avoid busy waiting and binary semaphores.

(b) What is Producer Consumer problem? How it can illustrate the classical problem of synchronization? Explain.

5. Attempt any *one* part of the following: 7 x 1 = 7

(a) Consider the following process:

Process	Arrival Time	Burst Time
P1	0	8
P2	1	4
P3	2	9
P4	3	5

What is the average waiting and turn around time for these process with

(i) FCFS Scheduling

(ii) Preemptive SJF Scheduling

(b) Consider the following snapshot of a system:

	Allocated			Maximum			Available		
Process	R1	R2	R3	R1	R2	R3	R1	R2	R3
P1	2	2	3	3	6	8	7	7	10
P2	2	0	3	4	3	3			
P3	1	2	4	3	4	4			

Answer the following questions using the banker's algorithm:

1) What is the content of the matrix need?

2) Is the system in a safe state?

6. Attempt any *one* part of the following: 7 x 1 = 7

(a) Explain Paging with example. Differentiate Paging and Segmentation.

(b) Explain the difference between External fragmentation and Internal fragmentation. How to solve the fragmentation problem using paging.

7. Attempt any *one* part of the following: 7 x 1 = 7

(a) What are files and explain the access methods for files.

(b) Write short notes on :

i) File system protection and security and

ii) Linked File allocation methods

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