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Sub Code: RCA301

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M. C. A.
(SEM III) THEORY EXAMINATION 2017-18
OPERATING SYSTEM

Time: 3Hours

Max. Marks: 70

Note: Attempt all Sections. Assume missing data, if any.

SECTION A

1. Attempt all questions in brief.

2 x 7 = 14

- What are advantages of spooling over buffering.
- What do you mean by thrashing?
- What is a lazy swapper and how it is used?
- Differentiate between global and local page replacement.
- What is the difference between hard real time and soft real time operating system?
- What do you mean by Virtual Memory? Discuss in short.
- Describe the difference between short-term scheduling and long-term scheduling.

SECTION B

2. Attempt any three of the following:

7 x 3 = 21

- What do you mean by Kernel? Describe various operations performed by Kernel.
- What do you mean by critical section problem? Write Peterson's Solution to solve this problem.
- What do you mean by Inter-Process Communication? Explain fundamental models of IPC in details.
- Find the page fault for following reference string (for 3 frames and 4 frames) using FIFO, LRU, MFU and Optimal page replacement algorithms:
1, 2, 3, 4, 1, 2, 5, 6, 3, 1, 3, 2, 4, 5
- What is the concept of deadlock? Discuss the necessary conditions for deadlock with examples.

SECTION C

3. Attempt any one part of the following:

7 x 1 = 7

- Explain the structure of an operating system. Also discuss various components of an operating system.
- What do you mean by monolithic and micro lithic kernels?

7 x 1 = 7

4. Attempt any *one* part of the following:

- (a) Describe Banker's algorithm for safe allocation.
- (b) What is the average turnaround time and waiting time of following with the FCFS and SRTF scheduling algorithms?

Process	Arrival time	Burst time
P1	0.0	8
P2	4.4	4
P3	1.0	1

5. Attempt any *one* part of the following:

7 x 1 = 7

- (a) Describe the Producer-consumer problem. Provide a solution to this problem using semaphores.
- (b) X What do you mean by critical section problem? Write Peterson's Solution to solve this problem. *Discuss various design issues in OS*

6. Attempt any *one* part of the following:

7 x 1 = 7

- (a) Find the page fault for following reference string (for 3 frames and 4 frames) using FIFO and LRU page replacement algorithms:
1, 2, 3, 4, 1, 2, 5, 6, 3, 1, 3, 2, 4, 5
Discuss whether Belady's Anomaly exists here or not.
- (b) Explain the concept of segmentation with proper diagram.

7. Attempt any *one* part of the following:

7 x 1 = 7

- (a) Describe the memory management and file system for LINUX operating system.
- (b) Discuss the following with respect to file system:
 - (i) Consistency Checking
 - (ii) Common file attributes