

# **MAHARAJA SURAJMAL INSTITUTE OF TECHNOLOGY**

## **Department Of Information Technology**

### **Assignment No. 2 ( CO2)**

Faculty Name: Dr. Minakshi Tomer

Class/ Semester: IT-3(5<sup>th</sup>)

Subject name: Operating System

Topic/ Unit: 2

Subject Code: CIC-305

Total Marks: 40

Date of Issue: 20/Sep

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Q1 Explain the following: (10)

- a) Name two differences between logical and physical addresses.
- b) Why are page sizes always powers of 2?
- c) Difference between External Fragmentation & Internal Fragmentation.
- d) Critical Section Problem
- e) Critical Regions & Monitors

Q2. Consider a logical address space of eight pages of 1024 words each, mapped onto a physical memory of 32 frames.

- a. How many bits are there in the logical address?
- b. How many bits are there in the physical address? (5)

Q3. Given memory partition of 100K, 500K, 200K, 300K, and 600K(in order),how would each of the algorithm(first fit, best fit, worst fit) in parts a, b, c places processes of 212K, 417K, 112K, and 426K(in order)? Which algorithm makes the best use of memory? (5)

Q4. Explain the “Dining Philosopher” classical IPC problem and its solution. (5)

Q5. Consider a paging system with the page table stored in memory.

- (a) If a memory reference takes 200ns, how long does a paged memory reference take?
- (b) If we add associative registers and 75% of all page table references are found in the associative registers ,what is the effective memory reference time ?(assume that finding a page table entry in the associative registers take zero time, if the entry is there). (5)

Q6. Consider the following page reference string-

(10)

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

How many page faults would occur for the following replacement algorithms assuming 1,2,3,4,5,6,7 frames? Remember that all frames are initially empty, so your first unique pages will all cost one fault each.

- LRU replacement
- FIFO replacement

Optimal replacement