R A N - 5 8 2 1

# RAN-5821

## MCA IIIrd Semester Examination

## March / April - 2019

## Paper: 302 Operating Systems

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

**સૂચના : / Instructions**

**નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.**
**Fill up strictly the details of ☛ signs on your answer book**

Name of the Examination:

☛ **MCA IIIrd Semester**

Name of the Subject :

☛ **Paper: 302 Operating Systems**

Subject Code No.: 5 8 2 1

Seat No.:

Student's Signature

**Q.1: Do as directed : [14]**

A) Consider the following reference string: 1, 2, 3, 1, 6, 7, 8, 6, 8, 9, 7, 8, 4, 5, 3, 4,

Show - how many page faults occur for LRU and Optimum page replacement algorithms, for four frames, if all frames are initially empty?

B) Consider the following snapshot of the system which is in safe state. A request from process PI arrives for (0, 4, 3, and 0). Explain - using banker's algorithm - if the request can be granted immediately?

| | Allocation | | | | Max | | | | Available | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P0 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 2 | 1 | 5 | 2 | 0 |
| PI | 1 | 0 | 0 | 0 | 1 | 7 | 5 | 0 | | | | |
| P2 | 1 | 3 | 5 | 4 | 2 | 3 | 5 | 6 | | | | |
| P3 | 0 | 6 | 3 | 2 | 0 | 6 | 5 | 2 | | | | |
| P4 | 0 | 0 | 1 | 4 | 0 | 6 | 5 | 6 | | | | |

**Q2: Attempt any 2** **[14]**

A) Define process. Explain state transition diagram of process.

B) Explain round robin algorithm for CPU scheduling. Justify the statement - 'Round robin algorithm is best suitable for interactive environment'.

C) Define Semaphore. Explain implementation of wait and signal operation to avoid busy waiting.

**Q3: Attempt any 2** **[14]**

A) Write the difference between internal and external fragmentation. Explain solutions for external fragmentation.

B) Explain - Inverted page table. State advantages and limitations of using Inverted page table.

C) What is thrashing? What is the cause of Thrashing? What can the system do to eliminate this problem?

**Q4: Attempt any 2** **[14]**

A) Explain working of DMA controller.

B) List various methods for management of free disk block for file system. Explain any two.

C) Explain acyclic graph directory structure.

**Q5: Attempt any 2** **[14]**

A) Explain characteristics of Microkernel. Discuss advantages and limitation of Microkernel.

B) Briefly explain SSTF, SCAN, C-LOOK disk scheduling algorithm. List advantages and limitations for each.

C) Explain -

(i) dual mode operation

(ii) system call

(iii) dispatcher

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