

*Or*

Describe scheduling criteria used in CPU scheduling. State and explain various CPU scheduling algorithms along with examples. **12**

- 13.** What is an operating system ? What are the underlining architectures of operating systems ? Give their pros and cons. **11**

*Or*

Write short notes on the following :

- (a) Logical and Physical Addresses **4**
- (b) Page Replacement Algorithms **4**
- (c) Swapping. **3**

**Roll No. ....**

**Exam Code : J-19**

**Subject Code—0375**

**M.C.A. (First Year) EXAMINATION**

**(5 Years Integrated Course)**

**(Main & Re-appear) For Batch 2009 Onwards)**

**OPERATING SYSTEM-I**

**MCA-105**

*Time : 3 Hours*

*Maximum Marks : 70*

**Section A**

**Note :** Attempt any *Seven* questions. **7×5=35**

- 1.** Discuss the five major activities of an operating system in regard to file management.
- 2.** Differentiate between multiprogramming batch system and time sharing system.
- 3.** What is Process ? Describe process states with the help of diagram.

4. Briefly discuss the threats to a distributed system.
5. Write short note on shortest-remaining-time-first scheduling.
6. Is it possible to have deadlock involving one process ? Explain your answer.
7. Distinguish between contiguous and noncontiguous memory allocation.
8. What is Belady's anomaly ? Show that a page replacement algorithm that possesses the stack property cannot exhibit Belady's anomaly.
9. Why are segmentation and paging sometimes combined into one scheme ?
10. Write short note on Virtual machines.

### Section B

**Note :** Attempt all the questions.

11. Differentiate between internal and external fragmentation. Which one occurs in paging systems ? Which one occurs in systems using pure segmentation ? 12

*Or*

What is Deadlock ? Explain different deadlock handling mechanism. 12

12. Consider the following snapshot of a system and answer the following questions using banker's algorithm : 12
  - (a) What is the content of the matrix need ?
  - (b) Is the system in a safe state ?
  - (c) If a request from process P1 arrives for (0, 4, 2, 0) can the request be granted immediately ?
  - (d) If yes, then give safe sequence.

Process	Allocation	Maximum	Available
	A B C D	A B C D	A B C D
P0	0 0 1 2	0 0 1 2	1 5 2 0
P1	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	