

June 2008

Roll No.

Subject Code—9473

M. C. A. (First Year) EXAMINATION

(5 Years Integrated Course)

MCA-105

OPERATING SYSTEM—I

Time : 3 Hours

Maximum Marks : 100

Note : Attempt any *Five* questions. All questions carry equal marks.

1. (a) Describe the functions of an operating system as a resource manager.
- (b) How are operating systems classified w.r.t. the advancements in different generations of computers ?
2. a. "An operating system provides the user with a virtual or extended machine." Justify this with respect to the functionality of an operating system.

(2-28)

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JUNE 2 2008

- (b) What are system calls ? How are they categorized ?
3. (a) Explain the terms process states, process hierarchies and process table.
- (b) Distinguish between a real time, a parallel and a distributed system.
4. Five batch jobs, A through E, arrive at a computer center at almost the same time. They have estimated running times of 10, 6, 2, 4 and 8 minutes. Their priorities are 3, 5, 2, 1 and 4, respectively, with 5 being the highest priority. Explain in brief each of the following scheduling algorithms and determine the mean process turnaround time :
- (a) Round robin
- (b) Priority scheduling
- (c) Shortest job first.
5. What is the significance of swapping in time-sharing systems ? Describe any two methods of keeping track of memory for allocation in the context of swapping ?

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June 2008

6. What happens when a page fault occurs ?
Compare the following page replacement algorithms with respect to optimality :
First-In. First-Out page replacement
Least Recently Used page replacement
Not-Recently-Used page replacement
7. What is the reason for race condition ? What conditions should hold to have a good solution for avoiding race condition ? Explain one method of avoiding race condition.
8. What is a deadlock ? How can it be detected and avoided ?

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