# 7540/SCS8C52/SCS9C52 APRIL 2013

## OPERATING SYSTEM

(For those who joined in July 2008 and after)

Time : Three hours Maximum : 75 marks

SECTION A — (10× 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. A program in execution is called

   (a) Process (b) Instruction

   (c) Procedure (d) Function.

2. The _____ operating system is the earliest and most common operating system architecture.

   (a) Layered (b) Monolithic

   (c) Microkernel (d) Kernel.

3. A _____ semaphore is a semaphore that is initialized to an integral value greater than zero and commonly greater than one.

   (a) Binary (b) Multiple

   (c) Counting (d) Triple.

4. _____ algorithm that ensures mutual exclusion between two threads and prevents both indefinite postponement and deadlock.

(a) Dijkstra's (b) Prim's

(c) Dekkers's (d) kruskal's.

5. Interval between the time of submission and completion of the job is called

(a) Waiting time (b) Turnaround time

(c) Throughput (d) Response time.

6. Which scheduling policy is most suitable for a time-shared operating system?

(a) Shortest-job First

(b) Elevator

(c) Round-Robin

(d) First-Come-First-Serve.

7. 'LRU' page replacement policy is

(a) Last Replaced Unit

(b) Last Restored Unit

(c) Least Recently Used

(d) Least Required Unit.

8. The _____ is an operating system component concerned with the system's memory organization scheme and memory management strategies.

(a) Memory manager (b) I/O manager

(c) Device manager (d) Scheduler.

9. A _____ is a group of fields.

(a) Record (b) file

(c) character (d) data base.

10. The _____ is a directory entry that specifies the location of the file on the storage device.

(a) Soft link (b) hard link

(c) Metadata (d) FCB.

SECTION B — (5 × 7 = 35 marks)

Answer ALL questions, choosing either (a) or (b)

11. (a) Define the term "Operating System". What are the characteristics of an operating system?

Or

(b) Define process. Describe the contents of a Process Control Block (PCB).

12. (a) What are the major benefits of implementing semaphores in the kernel?

Or

(b) Explain the Producer-Consumer problem.

13. (a) Describe how the four necessary conditions for deadlock apply to spooling systems.

Or

(b) Differentiate between pre-emptive and non-pre-emptive scheduling.

14. (a) Explain the difference between internal fragmentation and external fragmentation. 7

Or

(b) Explain the difference between demand fetch strategies and anticipatory fetch strategies in virtual memory system. Which one requires more overhead?

15. (a) Write a short note on file control block.

Or

(b) Why is file access control necessary?

SECTION C — ($3 \times 10 = 30$ marks)

Answer any Three questions.

16. Discuss about the monolithic operating system and microkernel operating system architectures.

17. Explain the hardware solution to the mutual exclusion problem.

18. Discuss about the first-in-first-out and round-robin process scheduling algorithms.

19. What are the memory management strategies? Explain.

20. Explain in detail about the file organization schemes.

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