Operating Systems
Midterm Exam

Name: _____

Lecture Questions (2 points each – no partial credit given)

1. What is a program that acts as an intermediary between a user of a computer and the computer hardware?

2. What are the 3 goals of an operating system?
   a.
   b.
   c.

3. Computer System can be divided into four components. List these four components.
   a.
   b.
   c.
   d.

4. List 3 computing environments
   a.
   b.
   c.

5. The operating system services provided include functions that are helpful to the user. List 2 of these functions.
   a.
   b.

6. The operating system services provided also include functions for ensuring the efficient operation of the system itself via resource sharing. List 2 of these functions.
   a.
   b.

7. What term refers to the programming interface to the services provided by the OS which are typically written in a high-level programming language like C or C++.

8. Name 3 of the 6 types of system calls and provide an example of each.
    a.
    b.
    c.
9. What is the difference in a program and a process?

10. What are the 5 states of a process?
    a.
    b.
    c.
    d.
    e.
11. What is a PCB?

12. Briefly explain what happens when the CPU switches to another process.

13. What are the 3 resource sharing options for parent and child processes?
    a.
    b.
    c.
14. What are the 2 execution options for parent and child processes?
    a.
    b.
15. Is the tree of processes in Linux a binary tree? Explain why or why not.

16. What 2 process termination steps are taken if a process executes last statement and then asks the operating system to delete it using the exit() system call?

    a.

    b.

17. Give two of the reasons a parent may terminate the execution of children processes using the abort() system call.

    a.

    b.

18. What is cascading termination and when/why is it used?

19. If parent process terminates without invoking wait, what term is used to refer to the child process?

20. Explain the “Race Condition”

21. What is mutual exclusion?

22. What are the two operations that can access semaphores?

    a.

    b.

23. What type of semaphore is the same as a mutex lock?

24. What term refers to two or more processes waiting indefinitely for an event that can be caused by only one of the waiting processes?

25. Explain the purposes of the P() and V() operations and provide a more common name for each: