System Level Design - Semester Exam - Apr 1

Name: **CSC3320**

When answering the questions below, make sure to show all of your work. Pay attention to the point values on each question. State your assumptions, and explain your answers thoroughly.

Time: Hours | Max Marks: 100

1. Which option shows real-time system logs in Linux? [1]

    a) journalctl -f

    b) ls -l

    c) echo

    d) cd /var/log

2. Which system call is used to wait for a child process to terminate? [1]

    a) wait()

    b) kill()

    c) exit()

    d) fork()

3. Aging is a technique used to: [1]

    a) Prevent starvation

    b) Increase response time

    c) Create zombie processes

    d) Prioritize I/O

4. What does `execvp()` do? [1]

    a) Searches for the program in PATH and executes it

    b) Creates new process

    c) Waits for process

    d) None of the above

5. Which scheduling policy is most suitable for time-sharing systems? [1]

    a) Round Robin

    b) FCFS

    c) SJF

    d) Priority Scheduling

6. What is the role of the `exit()` system call? [1]

    a) Terminates the current process

    b) Starts a new process

    c) Closes all file descriptors

    d) Restarts the OS

7. Which signal is used to interrupt a process (e.g., Ctrl+C)? [1]

    a) SIGINT

    b) SIGKILL

    c) SIGTERM

    d) SIGHUP

8. Which system call is used to move the file offset? [1]

    a) lseek()

    b) seek()

    c) fseek()

    d) offset()

9. Which command is used to list all running processes in Linux? [1]

    a) ps

    b) ls

    c) top

    d) jobs

10. Which command is used to display the CPU and I/O statistics in Linux? [1]

    a) vmstat

    b) df

    c) lsmod

    d) rmdir

11. Which of the following is not a scheduling algorithm? [1]

    a) LRU

    b) Round Robin

    c) SJF

    d) FCFS

12. Which system call provides information about a file? [1]

    a) stat()

    b) info()

    c) ls()

    d) view()

13. Which of the following can be used to debug a core dump? [1]

    a) gdb

    b) top

    c) man

    d) kill

14. What is the default action of the SIGKILL signal? [1]

    a) Terminates the process

    b) Ignores the signal

    c) Suspends the process

d) Restarts process

15. Which system call deletes a file? [1]

    a) unlink()

    b) remove()

    c) delete()

    d) rmdir()

16. Which signal cannot be caught or ignored? [1]

    a) SIGKILL

    b) SIGTERM

    c) SIGINT

    d) SIGSTOP

17. Which header is needed for using fork? [1]

    a) unistd.h

    b) stdio.h

    c) stdlib.h

    d) string.h

18. Which call registers a handler for a signal? [1]

    a) signal()

    b) kill()

    c) exec()

    d) wait()

19. What is the role of the `ptrace` system call? [1]

    a) Monitor and control execution of a process

    b) Copy data to another file

    c) Redirect input

    d) Encrypt files

20. What does `getpid()` return? [1]

    a) Process ID

    b) Parent Process ID

    c) User ID

    d) Thread ID
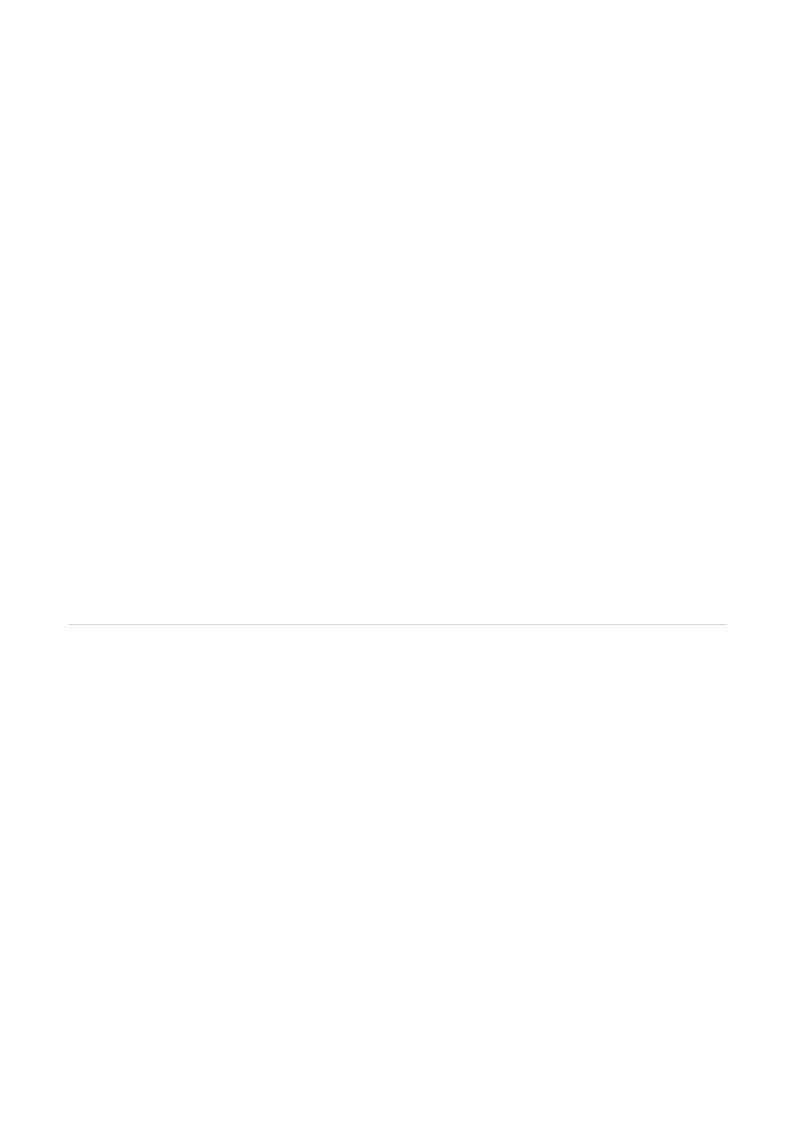
21. What is the difference between `dup()` and `dup2()`? [5]

22. Define a zombie process in operating systems. [5]

23. List the default file descriptors for stdin, stdout, and stderr. [5]

24. Explain the term linking. [5]

25. What is manual memory management, and where is it commonly used? [5]

26. What is Terminal?   [5]

27. What are the functions of system programs?   [5]

28. Define system software with examples?   [5]

29. Differentiate between static and dynamic linking. [7]

30. Explain how signals are used for inter-process communication (IPC). [7]

31. What is shared memory? [7]

32. Describe the phases of compilation. [7]

33. How does mmap() work in Linux? [6]

34. What is segmentation fault and why does it occur? [6]