System Level Design - Second MID - April 2025

Name: **CSE**

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. Remember that an explanation is expected with every answer except the multiple choice and true/false questions when the answer is true. Use blank paper if you do not have enough room..
Time: 09:00 to 12:00 | Total Marks: 75

1. What command would you use to list all running processes in Unix? [1]
   a) ps
   b) ls
   c) chmod
   d) kill
2. Which scheduling algorithm gives minimum average turnaround time? [1]
   a) SJF
   b) FCFS
   c) Round Robin
   d) Priority Scheduling
3. Which of the following is true about Multilevel Queue Scheduling? [1]
   a) Processes are permanently assigned to queues
   b) Processes can move between queues
   c) Used for disk I/O
   d) Rarely used in OS
4. Which tool is commonly used to trace system calls in Linux? [1]
   a) strace
   b) gdb
   c) top
   d) make
5. Which system call replaces the current process image with a new process image? [1]
   a) exec()
   b) fork()
   c) wait()
   d) exit()
6. Which tool helps inspect performance counters on Linux systems? [1]
   a) perf
   b) strace
   c) du
   d) env
7. Which metric measures the time from submission to completion of a process? [1]

a) Turnaround time

b) Response time

c) CPU burst

d) Context switch

8. Which scheduling algorithm may lead to convoy effect? [1]

a) FCFS

b) Round Robin

c) SJF

d) Multilevel Queue

9. What is the purpose of the `lsof` command? [1]

a) List open files

b) Start background job

c) Kill a process

d) Display CPU stats

10. Which call sends a signal to a process? [1]

a) kill()

b) signal()

c) raise()

d) alarm()

11. What is the primary goal of system-level debugging tools? [1]

a) Identify and resolve low-level bugs

b) Improve UI design

c) Compile code

d) Format storage

12. Which command will help check the disk I/O performance? [1]

a) iostat

b) free

c) lsblk

d) id

13. How is Priority Scheduling different from SJF? [1]

a) Uses priority instead of burst time

b) Uses time quantum

c) No difference

d) Priority scheduling is only for I/O-bound

14. How many processes are there after one successful fork() call? [1]

a) 2

b) 1

c) 0

d) Depends on OS

15. How does the operating system determine which process to run next? [1]

a) Using the scheduler

b) Paging table

c) Interrupt vector

d) File table

16. What is a zombie process? [5]

17. Name one difference between `execvp()` and `execlp()`. [5]

18. What is the role of `environ` in process environments? [5]

19. Name two common variants of the `exec()` family of functions. [5]

20. Define context switching. [5]

21. How is memory allocated and managed in kernel space? [7]

22. Explain the use of ptrace() for process tracing. [7]

23. How does the kernel manage file access and locks? [7]

24. Compare multithreading with multiprocessing at the system level. [9]