1. Which of the following is true about two major approaches to a shell?

   A shell that understands all commands is more efficient per command

2. What is the purpose of a system call?

   For a user program to request an OS service to be performed in kernel mode

3. How does a system call instruction indicate what service to request?

   It passes the system call number in a register

4. What is the difference between system call and API?

   A system call traps to kernel and is commonly written in assembly code to access low-level registers

5. What is the principle of separation between policy and mechanism?

   To maximize flexibility if policy decisions change later

6. Which of the following is true about monolithic kernel?

   It is lower overhead compared to microkernel but is hard to scale unless organized in a modular structure

7. Which of the following functions of a microkernel is done (i.e., executed) in kernel mode or user mode?

   Interprocess communication is done in kernel mode

8. How can a microkernel run an OS service in user mode while also protecting the rest of the system?

   Each service runs in its own address space and cannot affect the rest of the system

9. In SDCC, what is the purpose of __interrupt(4) as in void Serial_ISR(void) __interrupt(4)?

   It associates the Serial_ISR routine with the interrupt vector for UART and uses RETI for return

10. If you need to call the main() function from inlined 8051 assembly in SDCC, what do you have to write?

    lcall _main

11. What is the difference between a program, process, job and task?

    A program is the static executable, while a process is an instance of program in execution

12. What are the sections of memory of a process?

    Stack section contains the activation records of function calls, including auto-local variables, parameters, and return address

13. Which of the following is NOT a valid description of process state?

    Waiting: the process can be executed but it is waiting to be dispatched in a queue

14. What can trigger a context switch?

    An interrupt or a system call

15. In Unix-like Systems, which of the following is NOT a correct description of what fork() does?

    It spawns a process by copying the program image from the file specified by the parameter

16. Which of the following is true about process termination in a Unix-like system?

    A process implicitly calls exit() upon return from main()

17. Which of the following is true about shared memory vs. message passing for interprocess communication?

    Shared memory is faster because OS is involved only during setup but synchronization is trickier

18. Which of the following is true about the sender and receiver in bounded-buffer communication?

    In unbounded buffer, the sender never blocks, and the receiver blocks only if the buffer is empty

19. What are some advantages of generator in Python over interprocess communication between a producer process and a consumer process?

    It is easier to write and understand code for the producer and consumer

20. What is the difference between a thread and a process?

    A context switch between threads is lighter weight than between processes

21. Which of the following is a correct description of process vs. thread?

    Each process has it own address space, but Threads of a given process share the same address space