Operating Systems Midterm

Student Name:

Student ID:

Group Number:

This midterm is 60 minutes. There are 20 marks in total.
All questions are 1 mark, unless shown differently.
English only.

1. The operating system acts as an interface between the computer hardware and the human user. **True** or False?

2. Termination of a process does not terminate all threads within that process. True or **False**?

3. The CPU's kernel mode provides operations that are not available in user mode. **True** or False?

4. Long-term scheduler is fast as compared to short-term scheduler. True or **False**?

5. The decision as to which process, among ready processes, will be executed by the processor: _____
   a) Long-term scheduler.
   b) Medium-term scheduler.
   c) I/O scheduler.
   d) Short-term scheduler.

6. Fork() system call is used for _____.
   a) The dispatching of a task
   b) The creation of a new process
   c) Increasing the priority of a task
   d) None of the above

7. Which of the following components of a program state is not shared across threads in a multi-thread process?
   a) Text
   b) Heap
   c) Data
   d) Stack

8. Switching the CPU to another process requires to save state of the old process and loading new process state is called as _____
    a) Process Blocking.
    b) Context Switch.
    c) Time Sharing.
    d) None of the above.

9. The list of processes waiting for a particular I/O device is called a _____.
    a) Standby queue
    b) Device queue
    c) Ready queue
    d) Interrupt queue

10. Device controller informs CPU that it has finished its operation by causing an **interrupt.**

11. If processes don't fit in memory, **swapping** moves them in and out to run.

12. An important property of a scheduler is the ability to, in certain conditions, force a process to stop executing and schedule another process instead. What is this property generally called?

    Preemptive Scheduling

13. Name the two main inter-process communication method

    a) Shared Memory

    b) Message Passing

14. Why we use APIs rather than system calls?

    a) Portability

    b) Simpler call through API

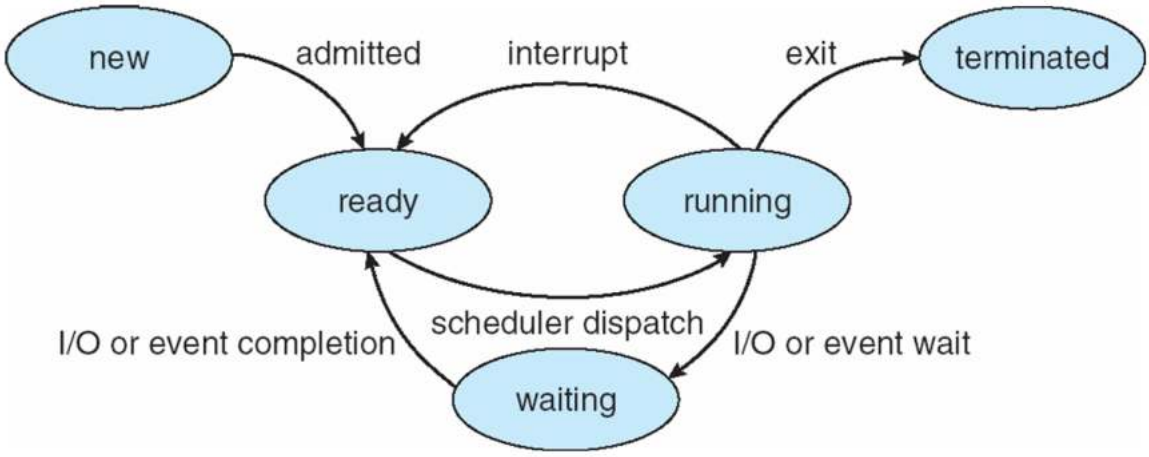
15. Write two reasons, why it is not possible to store programs and data in main memory permanently?

- **Main memory is usually too small to store all needed programs and data permanently.**
- **Main memory is a volatile storage device that loses its contents when power is turned off or otherwise lost.**

16. Write four points that you have to keep in mind while designing operating systems.

Single User, Multi User,
CLI, GUI,
Reliable,
Flexible
Convenient to use,
User friendly
Scheduling algorithm
Type of OS

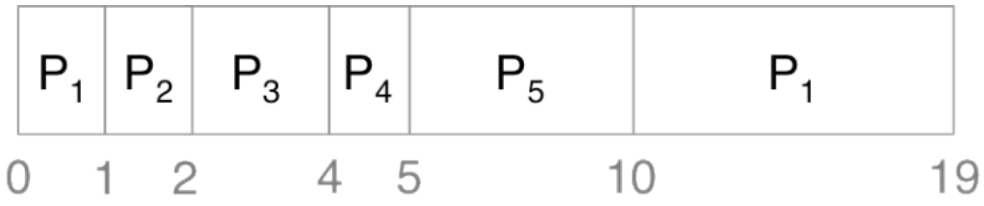
17. Draw Process state diagram. [2 Marks]



18.

Process	Burst Time	Arrival Time
P1	10	0
P2	1	1
P3	2	2
P4	1	3
P5	5	4

a. For the set of processes directly above, draw a Gantt chart for the SRTF (Shortest Remaining Time First) Scheduling Algorithm.



b. For the set of processes directly above, calculate the average waiting time for the SRTF (Shortest Remaining Time First) Scheduling Algorithm.

P1=9

P2=0

P3=0

P4=1

P5=1

Average Waiting Time=11/5=2.2