Computer Operating Systems

Problem#1
What is the purpose of a short-term CPU scheduler? What is the difference between a preemptive and a non-preemptive scheduler? Which type of scheduling (preemptive or non-preemptive) is used in most modern operating systems and why is it used? Explain round-robin (RR) scheduling, and how its behavior and performance varies with the size of the time quantum? Are there any constraints on how the quantum should be chosen?

Problem #2
Explain the difference between contiguous (continuous) allocation, linked (chained) allocation, and indexed allocation for file systems. Explain the combined scheme (multilevel indexed allocation) used by the Unix File System (UFS) and how it implements access for small and large files.

Problem#3
Explain the concept of a thread and of multithreaded programming. What are the benefits of multithreaded programming? Explain the difference between user and kernel threads and discuss the three models for establishing a relationship between the two.