1.1 What is an operating system? What are the main purposes of an operating system?

An operating system has three main functions: (1) manage the computer's resources, such as the central processing unit, memory, disk drives, and printers, (2) establish a user interface, and (3) execute and provide services for applications software.

1.2

batch:

Jobs with similar needs are batched together and run through the computer automatically //human don’t need to do anything

timesharing:

Several people use a same computer，cpu is devided into several time slices

dedicated:

also called embedded system, are designed for special task ,like mp3

real time: Often used in a dedicated application, this system reads information from sensors and must respond within a fixed amount of time to ensure correct performance.

multiprogramming

CPU switches quickly among different processes. Then even a single-core cpu can do different program.

1.3 pc are not strong enough or pc is expensive

2.

P1 35

P2 30

A)65 ，cause it is single programmed

B)15+10+10+15=50

c)2/65 2/50 ,multiprogramming saves Io burst time

3.

3.1

when the task is done, device controller send interrupt

3.2 the cpu pull in a crazy way

3,3   
As the save operation requires several steps to save the value of CPU registers, process state, memory-management information, etc.. It is in fact necessary to make the context-switch atomic to ensure consistency.

3.3)b use images

4.1 cause I/O are also tasks that need cpu to run

4.2 by setting the power bit from 0 to 1. he can read other processes information.

4.2.b forbid users to set the power bit

5.1 it is multicore

b/ it is single core and not multiprogramming ,and there is overhead

6.

a) Switch from user to monitor mode

Unprivileged because it's how applications invoke system calls. The catch is the application cannot control where the program counter goes when this switch happens.

b) Read the clock

Unprivileged, every process should be able to read the clock.

c) Clear locations in virtual memory

Unprivileged because this only harms the process calling it

d) Turn off interrupts

Privileged so that a process cannot monopolize the cpu.

7.  
The main difference between network operating system and distributed operating system is that a network operating system provides network related functionalities while a distributed operating system connects multiple independent computers via a network to perform tasks similar to a single computer.

I think there are no common routines because network operating system are not even designed for pc