Question 1
What is the difference between availability and reliability? Please explain it in details.

Availability is the probability a system is operational at a given time, i.e. the amount of time a device is actually operating as the percentage of total time it should be operating. In high availability applications, availability may be reported as minutes or hours of downtime per year. Availability features allow the system to stay operational even when faults do occur. A highly available system would disable the malfunctioning portion and continue operating at a reduced capacity. In contrast, a less capable system might crash and become totally nonoperational. Availability is typically given as a percentage of the time a system is expected to be available, e.g., 99.999 percent ("five nines").

Reliability can be defined as the probability that it will produce correct outputs up to some given time t. Reliability is enhanced by features that help to avoid, detect and repair hardware faults. A reliable system does not silently continue and deliver results that include uncorrected corrupted data. Instead, it detects and, if possible, corrects the corruption, e.g., by retrying an operation for transient (soft) or intermittent errors, or else, for uncorrectable errors, isolating the fault and reporting it to higher level recovery mechanisms (which may failover to redundant replacement hardware, etc.), or else by halting the affected program or the entire system and reporting the corruption. Reliability is often characterized in terms of mean time between failures (MTBF), with reliability = exp(-t/MTBF).

A piece of equipment can be available but not reliable. For example the machine is down 6 minutes every hour. This translates into an availability of 90% but a reliability of less than 1 hour. Generally speaking a reliable machine has high availability but an available machine may or may not be very reliable.

Question 2
Explain why users choose windows system instead of dos system? You could consider this in light of the usability.

Because for human beings windows system is much easier to use. Users can easily operate the system by using graphic user interface, which makes all the machine operations some meaningful shape, button, or menu for human users. Users can only type in command to operate DOS, in which the users cannot see what they do by directly. A system that cannot show the users the efforts of their commands can be more difficult to use than a graphic user interface.

Question 3
Make a sample of availability sensoria. (Hint: use the possible values we give in the table)

Source: An external system is sending a message to the user

Stimulus: Show unanticipated message to the user

Artifact: Processing the whole procedure

Environment: Normal operation

Response: record it; notify appropriate parties, including the user and other systems; disable sources of events that cause fault or failure; be unavailable for a pre-specified interval; continue to operate in normal or degraded mode

Response Measure: Time interval when the system must be available; availability time; time interval in which system can be in degraded mode; repair time