1. (15 %) Please briefly describe the following terms related to computer hardware:

(a) RAID

(b) Firewire ports (also called IEEE 1394 port)

(c) Augmented reality (AR) or Augmented virtual reality (AVR)

(d) RFID reader

(e) Biometric inputs

2. (15 %) Please briefly describe the following terms related to communication:

(a) Parity (even or odd parity)

(b) Web cookies (or HTTP cookies)

(c) WLAN (wireless local area network)

(d) Star network

(e) Token ring

3. (10 %) (a) What are the major differences between software interrupt and hardware interrupt? Please give an example for each case.

(b) How the CPU or microprocessor would react if there are collisions between software interrupt and hardware interrupt as well as there are collisions among several hardware interrupts?

4. (10 %) A clinical physician of NCKU hospital wishes to purchase a personal mobile device for recording the patient data and appointment. Could you give a suggestion for him to select a device from palm OS, Pocket PC, Smartphone, Blackberry, and embedded Linux device? (This is a "freestyle" question. You can make any assumptions and suggestions.)

5. (15 %) (a) What are the major features of Object Oriented Programming (OOP)?

(b) Please give an example for describing each feature.

(c) Please list the one OOP language and describe one typical application using OOP.

6. (15 %) Please write a function (or subroutine) using your familiar programming language (or pseudo codes) to separate an array of integer data into even and odd parts. Please arrange the even numbers in an ascending order but the odd numbers in a descending order. Please describe your input and output variables. (You can make any assumptions)

7. (20 %) Figure 1 is a trace of electromyogram (EMG), a signal measured from muscle reflecting the muscle force. Assumed that that the signal has been digitized via an analogue to digital converter (ADC) and stored in an ASCII file format.

(a) Could you write a program using your familiar programming language (or pseudo codes) to determine the numbers of zero-crossing, i.e. the numbers of points across the baseline of zero voltage.

(b) Draw a flowchart to describe your algorithm. You can give any assumptions if you wish.

(Figure 1)