

1. (15 %) Explain the following terms: (a) virtual reality; (b) Gopher; (c) GUI; (d) dynamic data exchange (DDE); (e) IEEE-488.
2. (15 %) Explain the following terms used in object-oriented programming (OOP):  
(a) data encapsulation; (b) inheritance; (c) polymorphism.
3. (20 %) Please write a program with your favorite computer language to measure the slope of two points in x-y plane. Your program can read the x and y values of the points from keyboard.
4. (15 %) Please describe the principles of random-access file and sequential file. List the possible advantages and disadvantages of both methods.
5. (15 %) The analogue-to-digital converter (ADC) is a device to sample the analogue signal into the digital form. Please give the important specifications for selecting an ADC.
6. (20 %) A physician in National Cheng Kung University wishes to setup a PC-based exercise measurement system. Assumed that a pair of foot-switch is attached to the heel of both foot. When the foot contacts the ground, the foot-switch is on and a pulse can be generated.  
Please describe your system setup and algorithm in block diagram for displaying the following parameters on CRT monitor:  
(a) The average running rate, i.e. the steps per minute;  
(b) The maximum running rate;  
(c) The overall running distance. (Assumed that the average step length is 1.2 meter).