

1. (20%) Simplify the following logic functions into the form of "sum of product terms".

$$F(W,X,Y,Z) = \sum m(0,1,2,8,9,12,13)$$

$$D(W,X,Y,Z) = \sum m(10,11,14,15)$$

2. (10%) What data structure is feasible for binary search? Why?

3. (10%) Differentiate Internet from WWW (world wide web).

4. (20%) Describe the process of executing an instruction for a CPU (assume that the program being executed has been loaded)

5. (20%) Why do a computer system need compiler, linker, loader, and operating system?

6. (20%) Prove that every logic function can be implemented using NAND gate (hint: every logic function can be implemented using AND, OR, and NOT gates).