1. Assume that a = 2, b = 3, c = 4. What is the value of each of the following Boolean expressions?

   (5%) a. (a > 2) OR (b > c)

   (5%) b. [NOT (a ≤ b)] AND (a+b ≥ c)

2. (10%) Using the TEACHER table and the COURSE table as follows, what will be the result of the following SQL query?

   SELECT * FROM TEACHER, COURSE WHERE TEACHER.NAME = COURSE.TNAME AND TEACHER.AGE > 37;

   TEACHER

ID	NAME	AGE
34	JSWu	35
25	WLHu	44
47	YLin	39

   COURSE

CNAME	TNAME	HOUR
C++	JSWu	3
LISP	WLHu	2
OS	JSWu	3
VLSI	WLHu	3
VB	YLin	2

3. (30%) Explain the following terms:

a. FTP	b. gateway	c. DNS	d. TCP/IP	e. Von Neumann bottleneck
f. ALU	g. PC-cluster	h. MIPS	i. SIMD	j. cache memory

4. (10%) Explain what are the differences between multiprogramming operating system and time-sharing operating system?

5. (20%) Write a C++ program to calculate a_{1000} where $a_n = (a_{n-1} + 2) \times a_{n-2}$ for $n \geq 2$ and $a_0 = 1$ and $a_1 = 2$.

6. (20%) Write a C++ program that input 3 float number a, b, c and output 2 roots of the polynomial $ax^2 + bx + c = 0$.