1. (10%) Please compare programming languages of interpreting language (直譯語言) and compiling language (編譯語言). What is the kind of Java language? What is the kind of JavaScript?

2. (10%) Please transfer the number expressions in different number systems below
   a) \(365_{10} = \_ \_ \_ \_ \_ \_ _ \_ _ \_ _\) \(_8 = \_ \_ \_ \_ \_ \_ _ \_ _ \_ _\) 
   b) \(11010010.1011_{2} = \_ \_ \_ \_ \_ \_ _ \_ _ \_ _\) \(_8 = \_ \_ \_ \_ \_ \_ _ \_ _ \_ _\)

3. (10%) DeMorgan’s theorem (迪摩根定理) is an important theorem in Boolean algebra (布林代數運算). What is DeMorgan’s theorem?

4. (15%) Show the true tables of the Boolean expression below
   a) \(a \lor b\) 
   b) \(a \land b\) 
   c) \(a \oplus b\)

5. (15%) Please compare the advantages and disadvantages of network topologies (網路拓樸或網路形態) as follows: a) star topology b) bus topology c) ring topology

6. (20%) Please describe 1’s complement and 2’s complement methods for negative integer expression. Show the binary expression of \(27_{16} - 147_{10}\) using 16 bits integer by 1’s complement and 2’s complement. Please explain why most systems implement 2’s complement to present negative integer.

7. (20%) There are three popular methods for passing data to a subroutine, call by reference, call by value, and call by address. Please explain the differences during these methods. If a pseudo code as below, what are the output values of different parameter passing?

```
PROCEDURE SUB(a,b,c)
VAR y:INTEGER;
BEGIN
  y=c+2; a=b+y; b=c-y;
END;

PROGRAM MAIN;
VAR x,y,z:INTEGER;
BEGIN
  x=1; y=2; z=3;
  SUB(x,y,z);
  output(x,y,z);
END.
```