淡江大學97學年度進修學士班轉學生招生考試試題

12-1

系別：資訊工程學系三年級　　科目：資　訊　概　論

可否使用計算機			
可		否	✓

本試題共 4 大題，1 頁

1. Please fill in the following blanks. Note that all answers should be written and indicated clearly in the answer sheet. (70%)

   (a) Convert the following numbers to their corresponding numbers in the specified number system.
   $37.625_{(10)}$ = __A__ $_{(2)}$ = __B__ $_{(8)}$ = __C__ $_{(16)}$

   (b) Numerical Data Representation: Base-2, 8-bit. If negative numbers are represented by 2's *complement*, answer the following questions.
   (i) 10101111 + 00101111 = __D__, (ii) 00101111 − 11010001 = __E__.

   (c) Consider the following procedure BIGSUB.

```
procedure BIGSUB;
   integer GLOBAL, RESULT;
   integer array LIST[1:2];
   procedure SUB(PARAM);
      integer PARAM;
      begin
      PARAM := 3;
      GLOBAL := GLOBAL + 1;
      PARAM := 5
      end;
   begin
   LIST[1] := 3;
   LIST[2] := 1;
   GLOBAL := 1;
   SUB(LIST[GLOBAL]);
   RESULT := LIST[1] + LIST[2]
   end;
```

   What is the resulting value of the variable: RESULT in BIGSUB after the return from SUB according to the following parameter-passing methods?
   (i) Passed by value: __F__, (ii) Passed by reference: __G__,
   (iii) Passed by name: __H__, (iv) Passed by value-result: __I__.

   (d) The *Infix* representation of an expression is as below, where **sqrt** is a unary operator to calculate the square root of a number.
   (b/2 + sqrt((b/2) * (b/2) − a*c)) / a
   (i) Transform the above *Infix* to *Prefix*: __J__,
   (ii) Transform the above *Infix* to *Postfix*: __K__.

   (e) Given a binary tree T, let the *preorder* traversal sequence of T be **ABDGKCEHLFIJM** and the *inorder* traversal sequence **DKGBAHLECIFMJ**. The *postorder* traversal sequence of T is __L__.

   (f) Simplify the Boolean function $F(w, x, y, z)$ in the indicated standard form, where
   $$F(w,x,y,z)=(w'+x'+z)(w'+z')(w+x+z')(w+x'+y+z).$$
   (i) in SOP form: __M__, (ii) in POS form: __N__.

2. Prove that *NAND* gate is a universal gate. (10%)

3. Describe the differences between "*Compiler*" and "*Interpreter*". (10%)

4. List the 7 layers of the ISO/OSI network reference model **in order** from the bottom to the top. (10%)