國立中央大學　資訊工程學系
九十三學年度 碩士在職進修專班 招生入學考試命題紙

科目：　數 位 設 計　　第一頁 共二頁

Q1: (a) What is the *8's complement* of an octal number 7654321 ?
(b) What is the *7's complement* of an octal number 7654321 ?
(c) Convert the octal number 7654321 to hexadecimal number.
(15%)

Q2: Use K-map method to simplify the following Boolean function in (a) sum of products and (b) product of sums.
F(w,x,y,z) = x'y'+x'z'+w'xy'z
d(w,x,y,z) = Σ(4,6,14)
(20%)

Q3: (a) List the truth table of a function F(A,B,C,D) = A⊕B⊕C⊕D where the symbol ⊕ denotes the Exclusive-OR function.
(b) List the truth table of a function F(A,B,C,D) = A⊙B⊙C⊙D where the symbol ⊙ denotes the Equivalence function.
(10%)

Q4: (a) Use a *decoder* to implement the following Boolean function:
F(w,x,y,z)=Σ(0,1,2,3,4,11,12,13,14,15)
(b) Use a *multiplexer* to implement the same Boolean function
(20%)

Q5: Given you the flow table (after state reduction) as shown below.
(a) Assign output values to the dashes associated with the unstable states.
(b) Design the asynchronous sequential circuit without using SR latch.
(c) Design the asynchronous sequential circuit using SR latch.

	x_1x_2 = 00	01	11	10
a	a , 0	a , 1	a , 0	b , -
b	a , -	a , -	b , 1	b , 1

(35%)