

# 四川大学平时测验试题 (2021~2022 - 1)

课程号: 304131030 课序号: 7 课程名称: 数字逻辑 (双语) 任课教师: 吴志红  
适用专业年级: 计算机类 2019 教学周: 8 学号: 姓名:

## 1. Convert the following numbers to the indicated radix numbers. (12p)

a).  $(27.4)_8 = ( )_2 = ( )_{16} = ( )_{10} = ( )_{8421BCD}$

b).  $(01000101.011000100101)_{BCD} = ( )_{10} = ( )_2 = ( )_{16}$

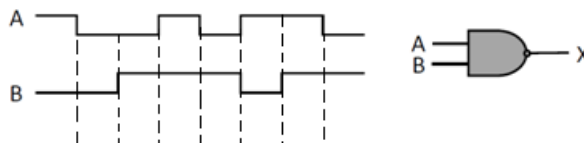
## 2. Calculate the following: (8p)

a)  $1101 + 1011$     b)  $11010 - 10111$     c)  $1011 \times 101$     d)  $1001 \div 11$

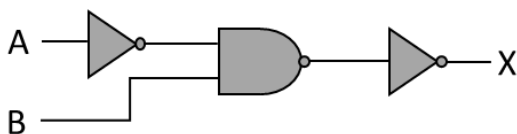
## 3. Complete the following table of equivalent values. Use binary numbers with a sign bit and 7 bits for the value. (12p)

Decimal	Sign-magnitude	1's complement	2's complement
123			
-98			

## 4. For the input waveforms below, determine the output for the NAND gate and draw the timing diagram. (8p)



## 5. Write the Boolean expression for the logic gate: (6p)



## 6. Apply DeMorgan's theorems to the following and simplify it: $(A + \overline{BC} + CD) + \overline{BC}$ (12p)

## 7. Using Boolean algebra, simplify the following expression: $\overline{A}B + \overline{A}B\overline{C} + \overline{A}BCD + \overline{A}B\overline{C}DE$ (4p)

## 8. Convert the following expression to standard SOP forms and develop its truth table: $\overline{A}(B + \overline{C}) + A(B \oplus C)$ (10p)

## 9. Use a Karnaugh map to reduce each expression: (18p)

a)  $F(a,b,c,d) = \sum m(2,4,6,8,9,12,13,14,15)$

b)  $F(x,y,z,w) = \sum m(2,4,6,8,13,14,15) + \sum d(0,7,9,10)$

## 10. Use AND gates, OR gate, and inverters as needed to implement the following logic expressions as stated. (10p)