四川大学期末考试试题（闭卷）

（2016~2017 学年第 1 学期）　　　　A 卷

课程号：311077030　课程名称：计算机组成与体系结构　任课教师：________

适用专业年级：软件工程 2015 级　学号：________　姓名：________

考生承诺

我已认真阅读并知晓《四川大学考场规则》和《四川大学本科学生考试违纪作弊处分规定（修订）》，郑重承诺：

1、已按要求将考试禁止携带的文具用品或与考试有关的物品放置在指定地点；

2、不带手机进入考场；

3、考试期间遵守以上两项规定，若有违规行为，同意按照有关条款接受处理。

考生签名：

题　号	一(10%)	二(15%)	三(26%)	四(30%)	五(19%)
得　分					
卷面总分		教师签名		阅卷时间	

注意事项： 1. 请务必将本人所在学院、姓名、学号、任课教师姓名等信息准确填写在试题纸和添卷纸上；

2. **请将答案全部填写在本试题纸上；**

3. 考试结束，请将试题纸、添卷纸和草稿纸一并交给监考老师。

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评阅教师	得分

一、判断改错题（本大题共 5 小题，每小题 2 分，共 10 分）

提示：正确打✓，错误打×，将其结果填写在下表中，并改正。

1	2	3	4	5

1. The Principle of Equivalence of Hardware and Software says that hardware and software are basically equivalent, and implementations done via either method will run at the same speeds.（　　）

2. The MAR, MBR, PC and IR registers in MARIE can be used to hold arbitrary data values.（　　）

3. As assembler is a program that accepts a symbolic language program and produces the binary machine language equivalent, resulting in a 1-to-1 correspondence between the assembly language source program and the machine language object program.（　　）

4. A two pass assembler generally creates a symbol table during the first pass and finishes the complete translation from assembly language to machine instructions on the second.（　　）

5. The geometric mean is more helpful to us than the arithmetic average when we are comparing the relative performance of two systems.（　　）

评阅教师	得分

二、名词解释题（本大题共 5 小题，每小题 3 分，共 15 分）。

提示：解释每小题所给名词的含义，若解释正确则给分，若解释错误则无分，若解释不准确或不全面，则酌情扣分。

1. Explain the functions of MARIA’s following registers: AC, MAR, MBR, PC and IR.（共 3 分）

2.What is a stack? （共 3 分）

3. What is the difference between synchronous buses and nonsynchronous buses? （共 3 分）

4. Explain the concept of pipelining. （共 3 分）

5. What is an address mode? List five types of address mode. （共 3 分）

评阅教师	得分

三、填空题（本大题共 13 空，每空 2 分，共 26 分）。

1. Name the three basic components of every computer : _____, _____,_____.

2. _____ creates internal fragmentation,_____, on the other hand, suffers from external fragmentation。

3. Name three different types of buses :_____, _____, _____.

4. List the three fields in a direct mapped cache address_____, _____, _____.

5. When a 32bit hex value 0x12345678 stored in a big endian byte-addressable machine from address 0, the value from byte address 0 to 7 will be _____, when stored in a little endian machine, the value will be_____

评阅教师	得分

四、问答题（本大题共 5 小题，共 30 分）。

1. Name and explain the main components of a von Neumann computer. (共 5 分)

2．(1) Explain how programmed I/O is different from interrupt-driven I/O. (3 分)

(2) How does direct memory access (DMA) work? (3 分)

3．Explain the steps in the fetch-decode-execute cycle. Your explanation should include what is happening in the various registers（共 5 分）

4. Suppose we have the instruction Load 200. Given that memory and register R1 contain the values below: （共 8 分）

Memory

100	600
…	
200	300
…	
300	100
…	
400	500
…	
500	400

R1 | 200 |

Assuming R1 is implied in the indexed addressing mode, determine the actual value loaded into the accumulator and fill in the table below:

Mode	Value Loaded into AC
Immediate	
Direct	
Indirect	
Indexed	

5. Convert the following expressions from infix to reverse Polish (postfix) notation. (6 分)

a) X×Y + W × Z + V × U

b) W × X + W × (U × V + Z)

c) (W × (X + Y × (U × V)))/(U × (X + Y))

评阅教师	得分

五、编程、设计及分析题（本大题共 2 小题，共 19 分）。

提示：每小题给出了一个程序设计要求，请按照要求写出源程序代码，如果源程序代码中出现语法错误或逻辑错误，则酌情扣分。

1. (共 9 分) Suppose we wish to evaluate the following expression:

Z = (A * B) - (C / D)

a) Convert the expression in postfix notation. (3 分)

b) Write a program to evaluate the above arithmetic statement using a stack organized computer with zero-address instructions (eg. add, subt, mult, devision instructions, and only pop and push can access memory). (6 分)

2.（共 10 分）A 2-way set-associative cache consists of four sets. Main memory contains 2K blocks of eight words each.

a. Show the main memory address format that allows us to map addresses from main memory to cache. Be sure to include the fields as well as their sizes. (4 分)

b. Compute the hit ratio for a program that loops 3 times from locations 5 to 61 in main memory. (6 分)