武汉大学试卷纸

专业 软件工程 年级 大三 学号 2017302580166 姓名 马睿祺

科目 网络及分布式 成绩	总分	1	2	3	4	5	6	7	8	9	10

装订线内请勿答题

A = "2017302580166"

B = 580166

Problem 1

Since $B = 580166 = (1000\ 1101\ 1010\ 0100\ 0110)_2$

Thus, C = 1101 1010 0100 0110

1101 1010 0100 0110

1110 0000 0000 0001

1011 1010 0100 1000 Here is an overflow of 1, added to the result.

The inverted code of this number is: 0100 0101 1011 0111.

Thus, the checksum is 0100 0101 1011 0111.

Problem 2

C_1 = 0100 0110 C_2 = 1101 1010

For adapter A_1, K = C_1 = $(0100\ 0110)_2$ = 70

For adapter A_2, K = C_2 = $(1101\ 1010)_2$ = 218

① For a 10Mbps broadcast channel,

the waiting time for A_1 is: $\frac{512 \times 70}{10} = 3584$ ms

the waiting time for A_2 is: $\frac{512 \times 218}{10} = 11161.6$ ms

② For a 100Mbps broadcast channel,

the waiting time for A_1 is: $\frac{512 \times 70}{100} = 358.4$ ms

the waiting time for A_2 is: $\frac{512 \times 218}{100} = 1116.16$ ms

Problem 3

The URL may be as the following:

cs.whu.edu.cn ? id = 2017302580166

Problem 4

E = 2400 + 70 = 2470

Since there is a 20 bytes IP header.

	Total length	data length	FF	offset
original	2470	2450	0	0
segment 1	700	680	1	0
segment 2	700	680	1	85
segment 3	700	680	1	170
segment 4	430	410	0	255

The related fields are as the followings:

segment1 | length=700 | ID=x | fragflag=1 | offset=0

segment2 | length=700 | ID=x | fragflag=1 | offset=85

segment3 | length=700 | ID=x | fragflag=1 | offset=170

segment4 | length=430 | ID=x | fragflag=0 | offset=255

Problem 5

a) $c(x, w) = 2$

$c(x, y) = 5$

$c(x, u) = \infty$

b) give a change as: $c(x, w) = 7$

c) give a change as: $c(x, w) = 1$

Problem 6

$x^4 + x + 1$ can be regarded as 10011.

the result sequence is: $\underbrace{0100\ 0110}_{8\text{ bits}}\ \underbrace{1001}_{5\text{ bits}}$

The sequence the receiver received is: 1100 0110 1001.

D is 1100 0110, G is 10011

```
          1010 0110
      ┌──────────────
10011 | 1100 0110 0000
        10011
        ─────
        10111
        10011
        ─────
         1000 00
         10011
         ─────
          11010
          10011
          ─────
           1110
           ↑
           R
```

Since this R is not equal to the remainder of $\frac{D \cdot 2^4}{G_1}$, the error is detected.

Problem 7

C: 1101 1010 0100 0110

Matching Principle:

① If there is a match, the router forwards the packet to a link associated with the match.

② If a prefix doesn't match any of these entries, the router forwards the packet to the default interface.

③ longest prefix matching rule.

Since C doesn't match any of these entries, the router forwards it to the default interface: 10.

Problem 8

M-3 = DA46

Mac-1 = 00-15-5D-41-DA-46.

① The creating and updating process:

1) The switch table is initially empty.

2). For each incoming frame received on an interface, the switch stores in its table: ① the Mac address, ② the interface from which the frame arrived, ③ the current time.

3) The switch deletes an address in the table if no frames are received with that address as the source address after some period of time.

The final switch table will look like:

Address	Interface	Time
00-15-5D-41-80-A8	2	20:01
00-15-5D-41-DA-46	1	20:02
	(for example)	(for example)

The hexadecimal variable is 0x0800, and the corresponding upper layer protocol is IPv4.

Problem 9.

① WiFi: 1) wide coverage:
2) no wiring required.
3) Fast transmission speed, the wireless standard IEEE 802.11 can reach 100Mbps.

② Bluetooth: 1) global working frequency band
2) strong security and anti-interference ability
3) short transmission distance
4) spread through FM spread spectrum technology.

③ 4G: 1) Fast communication
2) Adaptive resource allocation
3) communication technology is more intelligent
4) good compatibility.

My design:

This kind of technology must be wide spread and reliable. Dividing the network into multiple VLANs can reduce the number of devices participating in broadcast storms. Assign a switch port or user to a specific VLAN group. The VLAN group can be in a switching network or span multiple switches. Broadcasts in a VLAN will not be sent outside the VLAN. Adjacent ports will not receive broadcasts from other VLANs. This can reduce broadcast traffic, release bandwidth to user applications, and reduce the generation of broadcasts.