

2011

1 n
 x=2;
 while (x<n/2)
 x=2*x;
 A.O(log₂n) B.O(n) C.O(nlog₂n) D.O(n²)
 A x=2*x;
 k
 1 x=2 × 2=2¹⁺¹=4
 2 x=4 × 2=2²⁺¹=8
 3 x=8 × 2=2³⁺¹=16

 k x=2^{k+1}
 x<n/2
 2^{k+1}<n/2
 k<log₂n-2
 k=log₂n+C C
 O(log₂n)
 2 a,b,c,d,e
 d
 A.3 B.4 C.5 D.6
 B d
 d a,b,c e
 d
 a,b,c
 ...c...b...a... d d...c...b...a...
 e
 1:d,e,c,b,a 2:d,c,e,b,a 3:d,c,b,e,a 4:d,c,b,a,e
 3 A[0...n-1] front rear
 1 A[0]
 front rear
 A.0,0 B.0,n-1 C.n-1,0 D,n-1,n-1
 B front rear+1.
 rear n-1 front 0
 4 768
 A.257 B.258 C.384 D.385

C

10

10

$$768 - (2^9 - 1) = 257$$

9

$$(257 - 1) / 2 + 1 = 129$$

9

$$2^{9-1} - 129 = 127$$

$$257 + 127 = 384$$

5

1, 2, 3, 4 4, 3, 2, 1

A. 1, 2, 3, 4

B. 2, 3, 4, 1

C. 3, 2, 4, 1

D. 4, 3, 2, 1

C

A, B, D

6

2011

116

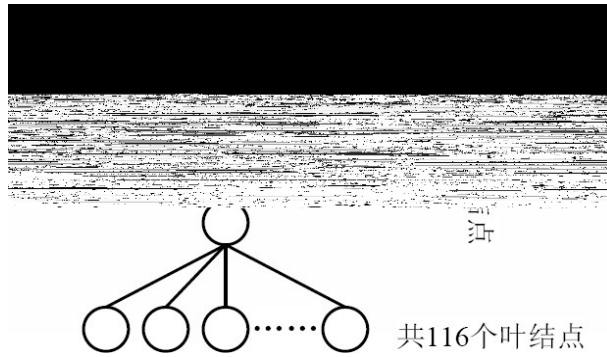
A. 115

B. 116

C. 1895

D. 1896

D



115

7

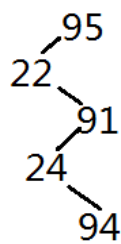
A. 95, 22, 91, 24, 94, 71

B. 92, 20, 91, 34, 88, 35

C. 21, 89, 77, 29, 36, 38

D. 12, 25, 71, 68, 33, 34

A



A

91

91

94

A

8

A.

B

C

D

C

1

2

3

4

9

Hash

A.

B.

C.

D.

B

Hash

10

A.

B.

C

D

A

11

25, 13, 10, 12, 9

18

A.1

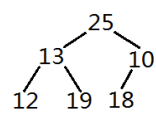
B.2

C.4

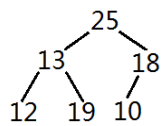
D.5

B

18

 $10 < 18$ ()

10 10



18<25 () 2

12

A.MIPS B.CPI C.IPC D.MFLOPS

D MFLOPS

13 float IEEE754 float x

32 FR1 $x=-8.25$ FR1

A.C104 0000H B.C242 0000H C.C184 0000H D.C1C2 0000H

A IEEE754

x -1000.01 = -1.00001 $\times 2^{11}$

E IEEE754 E-127=3 E=130 1000 0010

" 1 "

IEEE754 1 + 8 + 23

1 + 1000 0010 + 0000 1000 0000 0000 000

1100 0001 0000 0100 0000 0000 0000 0000 C1040000H

14

A.EPROM B.CDROM C.DRAM D.SRAM

B ROM RAM EPROM ROM SRAM

DRAM RAM CDROM

15 64MB 4M x 8 RAM

32MB MAR

A.22 B.23 C.25 D.26

D 32MB

25 32MB

64MB 64M

$2^{26} = 64M$ MAR 26

16

A. B. C. D.

A B C D

	—	
	$EA = A$	—
	—	
	$EA = (A)$	

	$EA = R_i$	
	$EA = (R_i)$	
	$EA = A + (BR)$	
	$EA = A + (IX)$	
	$EA = A + (PC)$	
	$EA = (A) + (IX)$	—

17

CF ZF SF

OF bgt

A. $CF + OF = 1$ B. $\overline{SF} + ZF = 1$ C. $\overline{CF} + \overline{ZF} = 1$ D. $\overline{CF} + \overline{SF} = 1$

C $x \ y$ bgt

$x > y$ $x - y$ 0 SF OF

C $x - y > 0$ $x - y \neq 0$ CF ZF

0

18

I.

II.

III. Load/Store

A. I II B. II III C. I III D. I II III

D I II III RISC

RISC

✧

✧

✧

✧ CPU

✧

CISC

RISC

✧

N

✧

19

Cache

“

”

A. CPU

B. CPU

C.

D.

C Cache Cache

PC CPU 1 C “ ” A B

20

A. B.

C. D.

C

21

$L_4 \sim L_0$ $M_4M_3M_2M_1M_0, M_i = 1(0 \leq i \leq 4)$

L_i $L_0 \rightarrow L_1 \rightarrow L_2 \rightarrow L_3 \rightarrow L_4$

$L_4 \rightarrow L_0 \rightarrow L_2 \rightarrow L_1 \rightarrow L_3$ L_1

A.11110 B.01101 C.00011 D.01010

D 5 L_1 L_3

L_3 1 0 01010

22

50MHz

500 A

200 CPU A I/O CPU

A.0.02% B.0.05% C.0.20% D.0.50%

C CPU 200 500 CPU

A I/O $500 \times 200 = 100000$ CPU A I/O

CPU

$\frac{100000}{50M} \times 100\% = \frac{100000}{50000000} \times 100\% = 0.2\%$

23

A

B

C

D

B = /

= + /

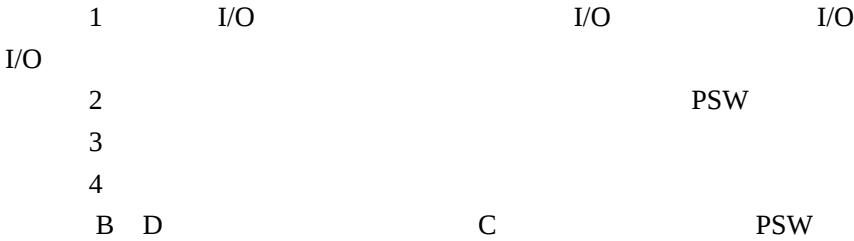
24

- A
- B
- C
- D

A CPU

CPU

CPU



25

P

- A P
- B P
- C P

D P
 D

P

26 I/O

A	→		→		→
B	→		→		→
C	→		→		→
D	→		→		→

B I/O
 C D I/O
 B

27

	R1	R2	R3	R1	R2	R3	R1	R2	R3
P1	2	0	0	0	0	1	0	2	1
P2	1	2	0	1	3	2			
P3	0	1	1	1	3	1			
P4	0	0	1	2	0	0			

A. P1, P2 P3, P4 B. P1 P3 P2 P4 C. P1 P4 P3 P2 D.
 D R1
 P1 P1 R2 2
 P4 P4 R2 2 P2 P3

28

I II I/O III
A. I, II B. II C. III D. I, II III
 D

I/O

29

trashing

I.
II.
III.
A. I B. II C. III D. I, II
 A I

B 4 4
 2bit $2^2=4$
 n $=n \times$ 2400bps n=2
 1200bps
 35 SR 0~3
 1 0 2
 A. 1 B. 2 C. 3 D. 4
 B
 0 1 2 3 4 0 1 2
 3 ACK5 0 1 2 3 4
 5 N
 1 0 2 0 2
 N GBN
 A

36 MAC
 A. CSMA B. CDMA C. CSMA/CD D. CSMA/CA
 D A C B D
 CSMA/CD
 CSMA/CD
 CSMA CSMA
 CSMA/CA IEEE802.11 CSMA

CDMA
 37 R1 192.168.1.0/24 R1
 IP R1
 D 192.168.2.0/25
 192.168.2.128/25
 192.168.2.0 **11000000 10101000 00000010** 00000000
 192.168.2.128 **11000000 10101000 00000010** 10000000

24 192.168.2.0/24 24 1
 0 11111111 11111111 11111111 00000000 255.255.255.0
 192.168.1.2



- A. 192.168.2.0, 255.255.255.128, 192.168.1.1
- B. 192.168.2.0, 255.255.255.0, 192.168.1.1
- C. 192.168.2.0, 255.255.255.128, 192.168.1.2
- D. 192.168.2.0, 255.255.255.0, 192.168.1.2

38 192.168.4.0/30 192.168.4.3 IP

- A. 0 B. 1 C. 2 D. 4

C 192.168.4.0/30 2

192.168.4.00000000 192.168.4.00000011

192.168.4.0 192.168.4.3

192.168.4.3 1

IP

2 4-2=2 0 1

39 SYN=1,seq=11220 TCP TCP

TCP

- A. (SYN=0,ACK=0,seq=11221 ack=11221)
- B. (SYN=1,ACK=1,seq=11220 ack=11220)
- C. (SYN=1,ACK=1,seq=11221 ack=11221)
- D. (SYN=0,ACK=0,seq=11220 ack=11220)

C

SYN

ACK FIN 1 A D 1 ACK
 11221 11220 11221 seq
 seq

连接建立:

分为 3 步:

- (1) SYN=1,seq=x
- (2) SYN=1,ACK=1,seq=y,ack=x+1
- (3) ACK=1,seq=x+1,ack=y+1

释放连接:

分为 4 步:

- (1) FIN=1,seq=u
- (2) ACK=1,seq=v,ack=u+1
- (3) FIN=1,ACK=1,seq=w,ack=u+1
- (4) ACK=1,seq=u+1,ack=w+1

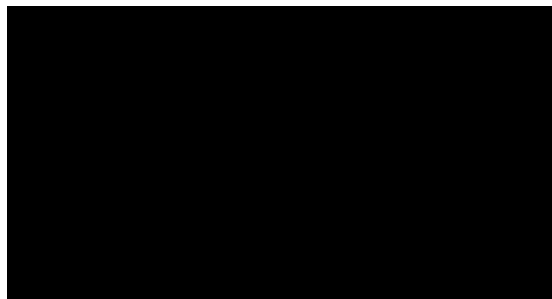
40 TCP 3 TCP
 300 400 500 3 900
 1 3
 A. 300 B. 500 C. 1200 D.1400
 B 2
 900 2 400 2 500
 TCP
 500

41 6 0 5 G A

4	6	∞	∞	∞	5	∞	∞	∞	4	3	∞	∞	3	3
---	---	----------	----------	----------	---	----------	----------	----------	---	---	----------	----------	---	---

- (1) G A
- (2) G
- (3) G

1 “ ”



[0 0 0 0 0 0]

5, 4, 3, 2, 1

4	6	∞	∞	∞	5	∞	∞	∞	4	3	∞	∞	3	3
---	---	----------	----------	----------	---	----------	----------	----------	---	---	----------	----------	---	---

第一行

第二行

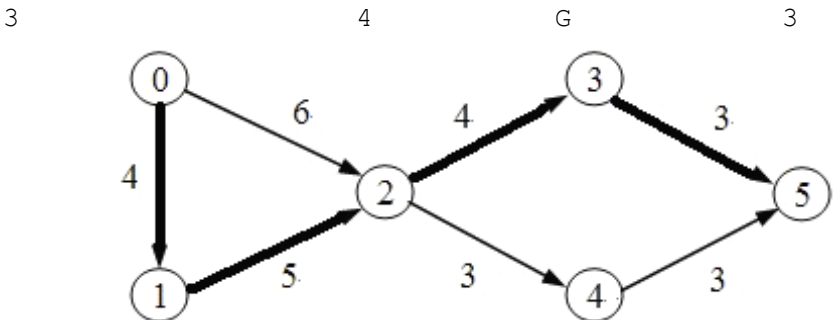
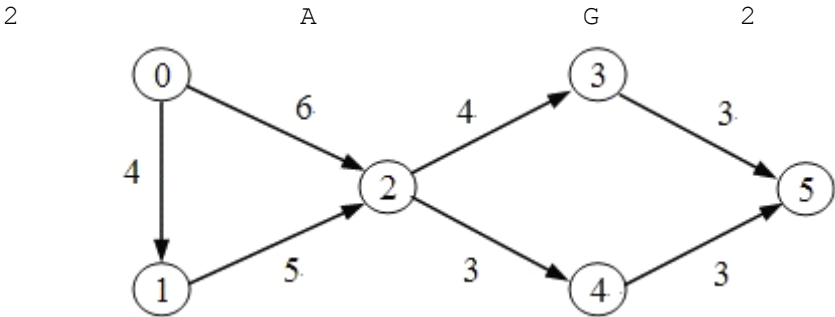
第三行

第四行

第五行

2

$$A = \begin{bmatrix} 0 & 4 & 6 & \infty & \infty & \infty \\ \infty & 0 & 5 & \infty & \infty & \infty \\ \infty & \infty & 0 & 4 & 3 & \infty \\ \infty & \infty & \infty & 0 & \infty & 3 \\ \infty & \infty & \infty & \infty & 0 & 3 \\ \infty & \infty & \infty & \infty & \infty & 0 \end{bmatrix}$$



$$4+5+4+3=16$$

42

L

L ≥ 1

S

$\lceil L/2 \rceil$

S

S₁

= (11, 13, 15, 17, 19)

S₁

15

S₂

= (2, 4, 6, 8, 10)

S₁

S₂

11

A

B

A

B

1

2

3

C

C++

JAVA

1

5

$O(n)$, $O(n)$
 A B a b
1 $a = b$ a b
 a b ab a b
 ab $a=b$ a
2 $a < b$ (a, b) $...a...b...$
 (a, b) a A b B
 a b
2 8
int Search(int A[], int

```

        else
        {
            if ((s1+e1)%2==0) //
            {
                e1 = mid1; //    A
                s2 = mid2; //    B
            }
            else {           //
                e1 = mid1+1; //    A
                s2 = mid2;   //    B
            }
        }
    }
    return (A[s1] < B[s2] ? A[s1] : B[s2]);
}

```

3 $O(\log_2 n)$ $O(1)$ 2

1 $n/2=n/(2^1)$

2 $n/4=n/(2^2)$

...

...

k $n/(2^k)$

2

$n/(2^k)=2$

$k=\log_2 n - 1$

$O(\log_2 n)$

$O(1)$

43 8 C

unsigned int x=134;

unsigned int y=246;

int m=x;

int n=y;

unsigned int z1=x-y;

unsigned int z2=x+y;

int k1=m-n;

int k2=m+n;

8 8

R1~R8

x y m n z1 z2 k1

k2

1		R1	R5	R6
2		m	K1	
3		/		/
4			/	

	1	R1	134	1000 0110B	86H
R5	$x - y$	$x - y = -112$		1001 0000B	90H
	$x + y$	$x + y = 380$		<u>1</u> 0111 1100B	R6
7CH		8		0 255	$x + y = 380$

2	m	1000 0110B	m	int
m	1111 1010	1000 0110	1	-122
	1111 0110B	n	1000 1010	-10
3				k1=-122- -10 =-112

4			k2
8		-128 +127	k2=m+n=-122-10=-132
k1=-112	-128	+127	

1

	8
-128	127
127	
-128	
	1
	-1
2	

3

1

2

1.

2.

2

”

“

2.10

2.10 1

0 0

1

2.10

2

1 1

0

2

2.11

2.12

2.11

x

= 1.0101

y

= 1.1001

x + y

=

x + y

=

x

= 1.0101

+ y

= 1.1001

0.1110

1

0

2.12

x

= 1.1000

y

= 1.1000

x + y

=

x + y

=

x

= 1.1000

+ y

= 1.1000

1.0000

1

1

-1

-1

2

2

1

0

1

0

2.11

$1 \oplus 0 = 1$

2.12

$1 \oplus 1 = 0$

3

1 2

1 2

4

2

· 2

·

2

01

2.14

$$2.13 \quad x = 00.1011 \quad y = 00.0111 \quad x + y =$$

$$\begin{array}{r} x + y = x = 00.1011 \\ + \quad y \quad = \underline{00.0111} \\ \hline 01.0010 \end{array}$$

“ 01 ”

“ 0 ”

$$2.14 \quad x = 11.0101 \quad y = 11.1001 \quad x + y =$$

$$\begin{array}{r} x + y = x = 11.0101 \\ + \quad y \quad = \underline{11.1001} \\ \hline 110.1110 \end{array} \quad 1$$

“ 10 ”

“ 1 ”

“ 00 ”	“ 11 ”

44

1MB

4KB Cache

16MB

8

Cache

32B

Cache

44-a

44-b

1	1	04	---
2	1	15	---
3	1	02	---
4	0	-	---
5	1	2B	---
6	0	-	---
7	1	32	---

题 44-a 图页表的部分内容

1	0	-	---
2	1	01D	---
3	1	105	---
4	1	064	---
5	1	14D	---
6	0	-	---
7	1	27A	---

题 44-b 图 Cache 的部分内容

1

2

Cache

3

001C60H

Cache

4

4

TLB

TLB

8

44-c

024BACH



44-c TLB

1

16MB

24

$$2^{24} = 16M$$

$$4KB \quad 2^{12} = 4K$$

12

1MB

20

$$2^{20} = 1M$$

12

$$20-12=8$$

8

2

Cache

3

12 位

3 位

5 位

主存字块标记	Cache 字块标记	字块内地址
--------	------------	-------

32B

5

Cache 8

3

$$20-5-3=12$$

3

001C60H

12

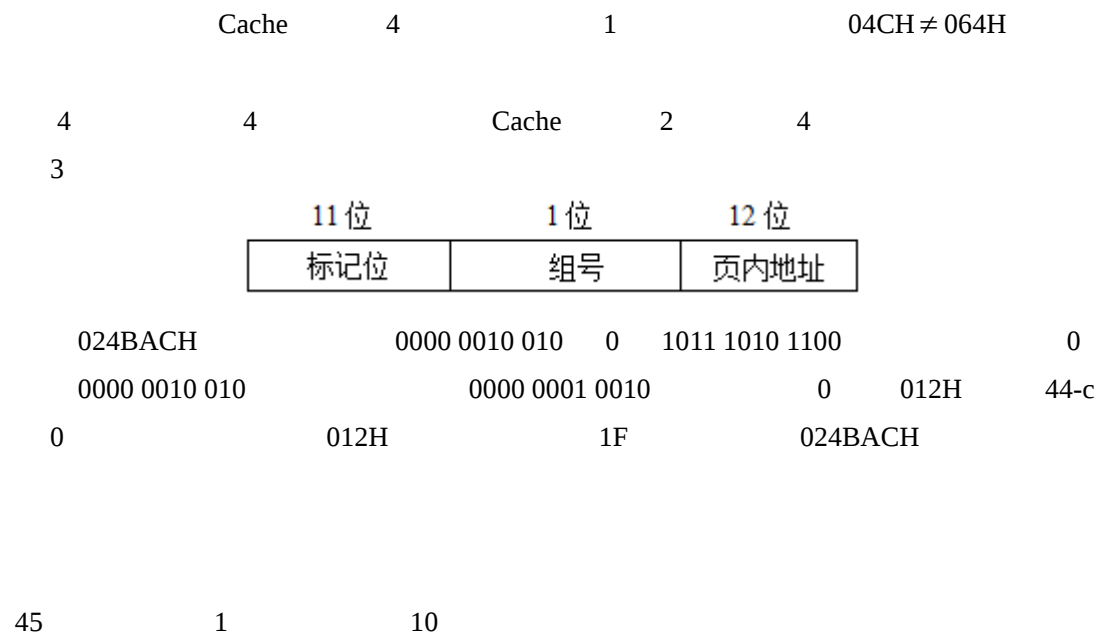
001H=1

1

1

04H

04C60H



```
cobegin
{
    Process
    {

    }
    Process
    {
        While TRUE
        {

        }
    }
}coend

P V wait() signal()
```

```
Semaphore seets = 10; // 10
Semaphore mutex = 1; // 1
Semaphore custom = 0; // 0

Process
{
    P(seets); //
```

```
P(mutex);      //

V(mutex);      //
V(custom);      //

V(seets);      //

}
```

```
Process
{
    While(true)
    {
        P(custom);    //

    }
}
```

46

1

FCB
FCB

1

2 FCB FCB FCB FCB

47 MAC 00-15-C5-C1-5E-28 IP 10.2.128.100

47-a 47-b Web 1 80
ASCII



题 47-b 图 以太网数据帧（前 80 字节）

1	Web	IP	MAC
2		47-b	MAC
		MAC	



题 47-d 图 IP 分组头结构

47-b 0000 0010 0020

1	IP	MAC	IP	MAC
---	----	-----	----	-----

