

Operating Systems, Mid Term Solution

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① e)
Parent for ( fork() ; fork() ; fork() ) break;
      for ( ; fork() ; fork() )
      break;
Parent for ( ; ; fork() )
      break;
      C2 for ( ; ; fork() )
      break;
      C1, for ( ; ; fork() )
      break;
Total child Processes
    
```

Q2. a) $T_{mem} = 100 ns$

$T_{flb} = 10 ns$

$t_{falt} = 2 ms$

$Pr_2 = T_{flb}Hit = 85\%$

$Pr_1 - Pr_2 = 13\%$

$1 - Pr_1 = 2\%$

$$0.85 \times (110) + 0.13(10 + 200) + 0.02(10 + 100 + 2000000 + 10 + 200)$$

$= 93.5 + 27.3 + 400064$

$= 40129.2 \approx 40129 \underline{ns}$

3) a) 1 2 3 5 2 1 5 6 2 1 2 3 7 6 3 2

1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
<u>4*</u>				<u>1*</u>														<u>1*</u>

6 fault in optimal

8 faults in LRU

- b) i) yes sequence is safe, there can be many safe seq
 ii) yes it can be granted, it will also have safe seq

Q4. a)

wait(n)
 {
 critical section
 }
 signal(n)

signal(n)
 {
 critical section
 }
 signal(n)

8 Process doing this

2 Process doing this

5 processes will be in CS at once

b) LCM, Time slice = 1

Chapter 7 Scheduling

Time of scheduling	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CPU time consumed by processes	P ₁	0	1	2	2	2	2	2	2	2	2	2				
	P ₂		0	1	1	1	2	2	2	2	2	2				
	P ₃			0	1	1	1	2	2	2	2	2	2	3	4	5
	P ₄					0	1	1	1							
	P ₅									0	1	2	2	2	2	
Process scheduled	P ₁	P ₁	P ₂	P ₃	P ₄	P ₂	P ₃	P ₄	P ₅	P ₅	P ₁	P ₂	P ₃	P ₅	P ₃	P ₃

Q5. (a) i) $\sqrt{256} = \sqrt{2 \times 2^7 \times 2^{10} \times 2^{-3}}$
 $= \sqrt{2^2} = \sqrt{2 \times 2^{10}} \text{ bytes} = 2 \text{ kB}$

ii)

	P_1	P_2	P_3	Page size = 32 kB
Pages size	455	100	320	
no. of pages	$\frac{15}{480 \text{ bytes}}$	$\frac{4}{128}$	$\frac{10}{320}$	
	480-455	128-100	320-320	
Internal frag.	= 25 kB	<u>28 kB</u>	0 kB	
		Max ^m internal frag.		

iii) Exec function description in 5 sentences.