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1. Notes on operation:
   a. line 10 child is created
   b. child hops into if at 11
   c. another child is created at 14
   d. Child 2 hops into if at 15
   e. child 2 writes all of 9 into array
   f. child 1 hops into else
   g. y is set to 9, then 25, written into array
   h. Parent hops into else
   i. Z becomes 50

   At line A the output is 50

2:

a)

t=0 p1 9
t=9 p2 8
t=17 p3 15
t=32 p4 3
t=35 p5 3
t=38 p5 0

P1: 0ms
P2: 8ms wait time
P3: 12ms wait time
P4: 22ms wait time
P5: 23ms wait time
8+12+22+23 = 65 /5 = 13ms of wait time

b)

t=0 p1 9
t=1 p2 8 p1 8
t=5 p1 4 p2 8 p3 15
t=9 p1 0 p2 8 p3 15
t=10 p2 7 p3 15 p4 3
t=12 p4 1 p2 7 p3 15 p5 3
t=13 p4 0 p2 7 p3 15 p5 3
t=16 p5 0 p2 7 p3 15
t=23 p2 0 p3 15
t=38 p3 0

P1: 0ms wait time
P2: 16ms wait time
P3: 18ms wait time
P4: 0ms wait time
P5: 1ms wait time

16+18+1 = 35 /5 = 7ms of wait time

3.

	Alloc	Req	Avail	
	ABCD	ABCD	ABCD	
P0	0101	2010	1001 (+1111)	P3
P1	2022	2021	2112 (+0101)	P0
P2	1111	1102	2213 (+1111)	P2
P3	1111	1001	3324 (+2022)	P1
P4	0002	2020	5347 (+0002)	P4
			5348	

The system operates safely. There is no deadlock

4.

Given disk blocks =512B
so 512/4=128 B.

$10 * 512 + (128 * 512) + (128^2 * 512) + (128^3 * 512) = 1082201088$ B