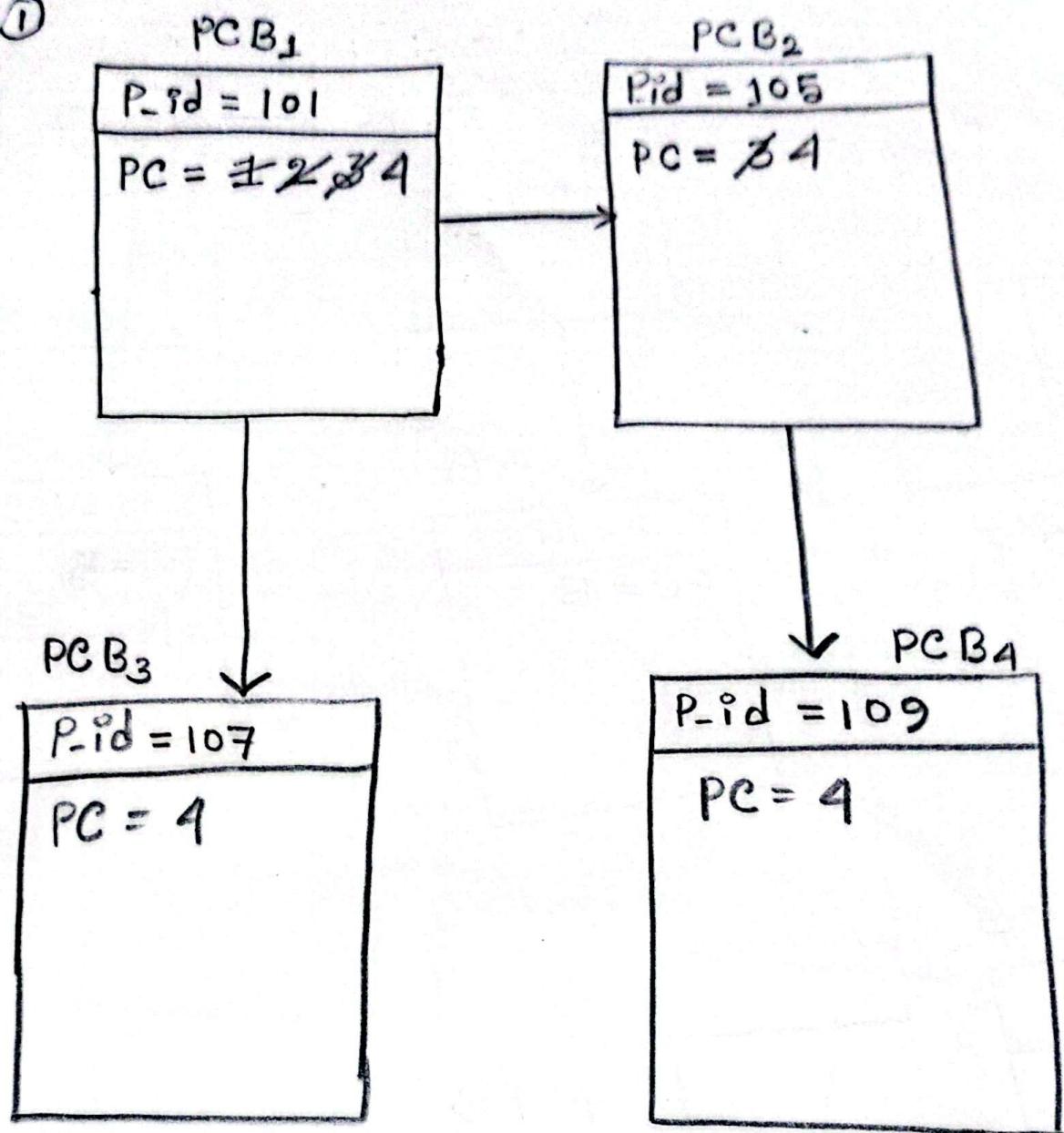


int main(){ —1  
    fork(); —2  
    fork(); —3  
    printf("A"); —4  
}

①

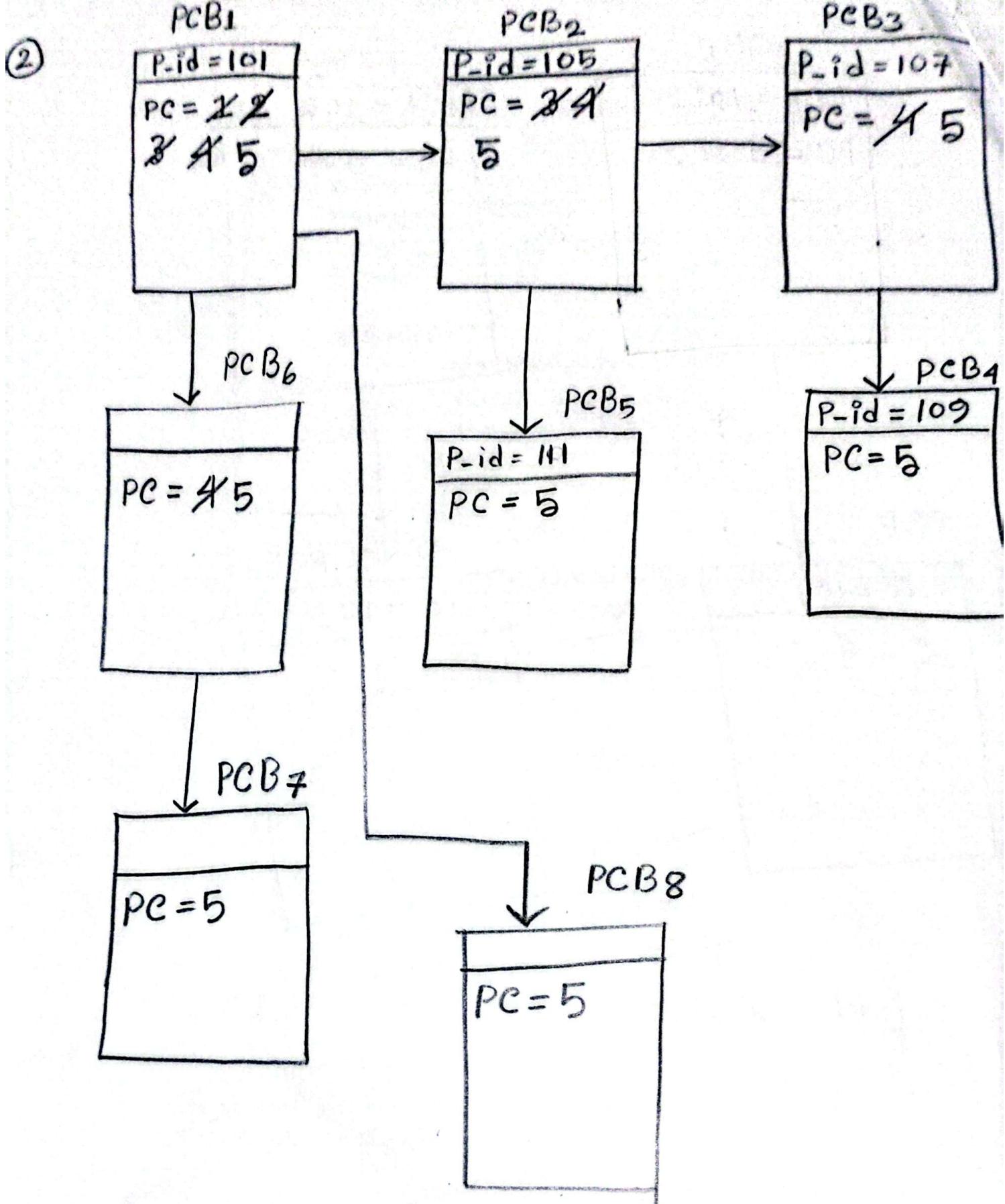


Print: AAAA

ARRRARR

}

```
int main(){ — 1  
    fork(); — 2  
    fork(); — 3  
    fork(); — 4  
    printf("A"); — 5  
}
```

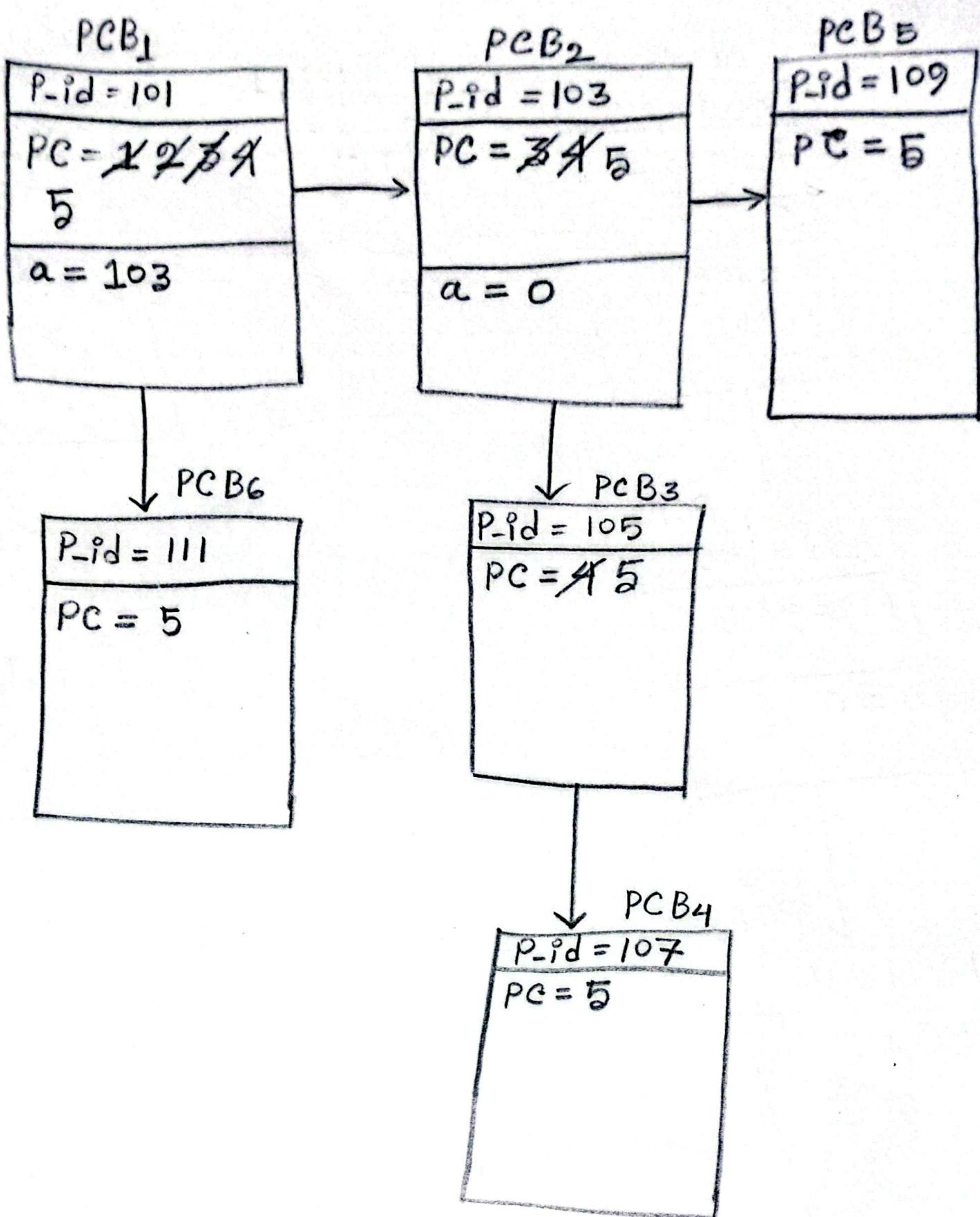


Print: AAAAAA

③

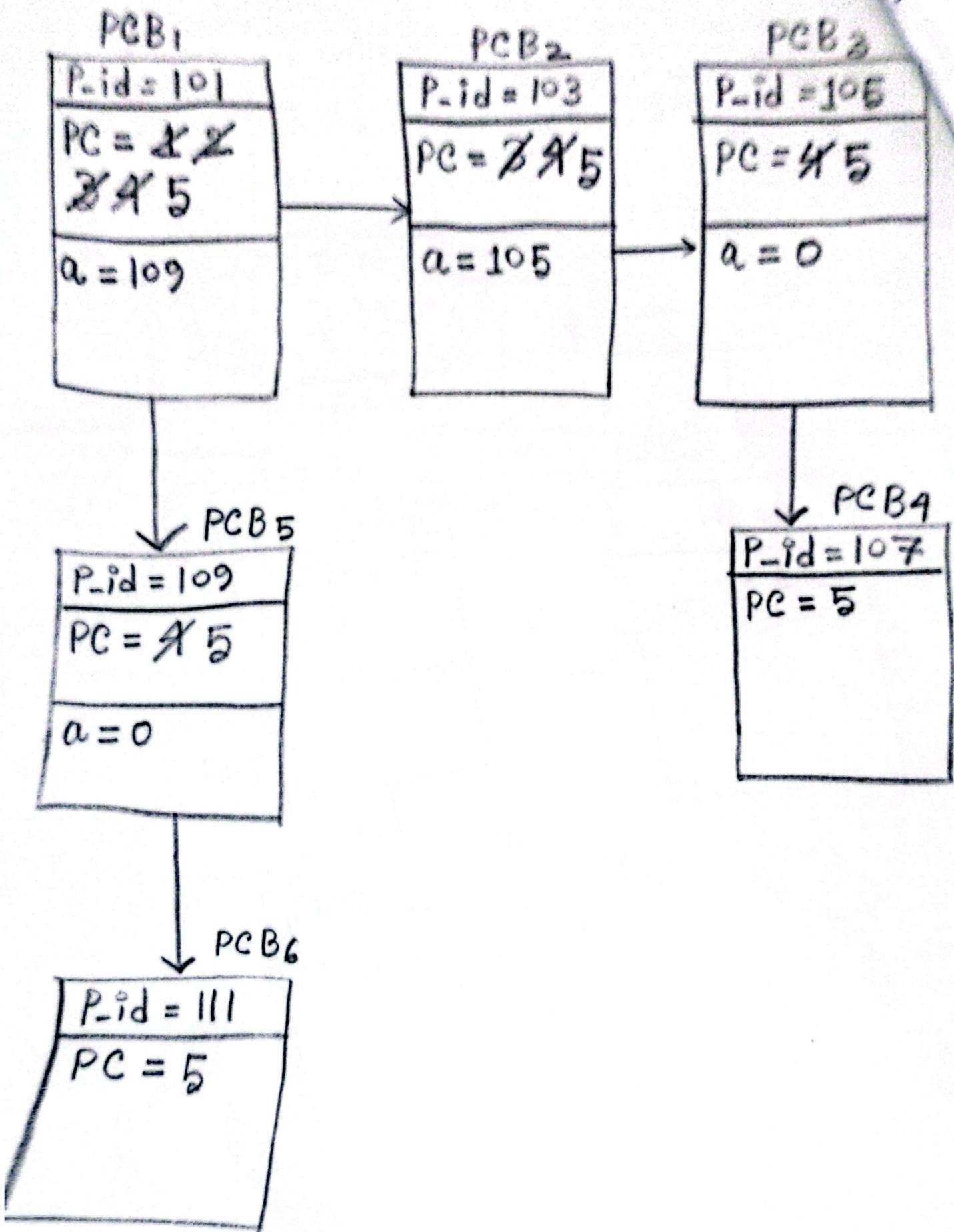
```
int main(){ → 1  
    a = fork(); → 2  
    if(a==0) fork(); →  
    fork(); → 4  
    printf("A"); → 5  
}
```

③



Print: AAAAAAA

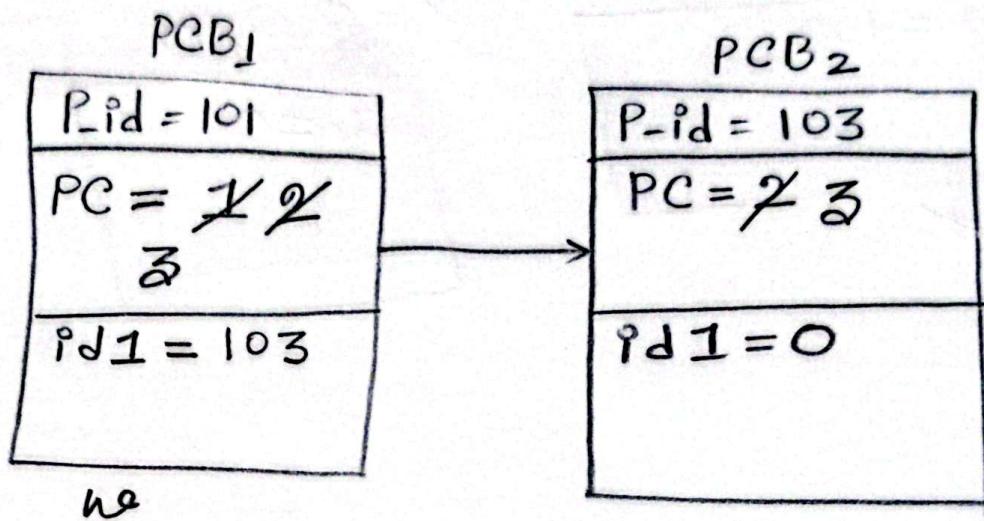
```
int main(){ — 1  
    fork(); — 2  
    a = fork(); — 3  
    if(a==0) fork(); — 4  
    printf("A"); — 5  
}
```



Print: AAAAAAA

$\text{id}1 = \text{fork}();$  — 1  
 if ( $\text{id}1 > 0$ ) {  $\text{wait}()$  } — 2  
 $\text{Print}("A")$  — 3

Soln:

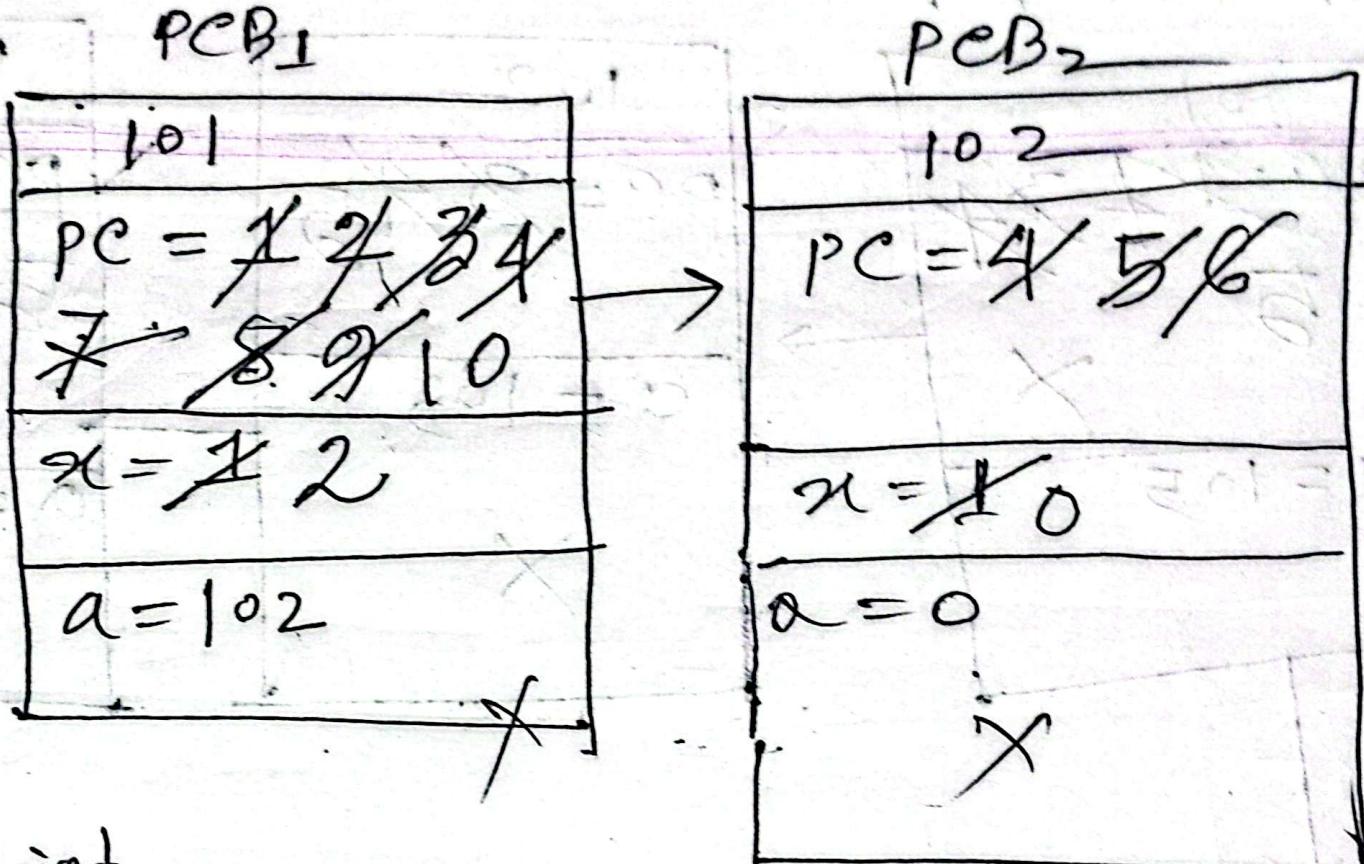


Print: AA  
 $\downarrow$   $\swarrow$   $\rightarrow$   
 $\text{PCB}_2$   $\text{PCB}_1$

5

```
main: _____ 1
      x = 1 _____ 2
      a = fork() _____ 3
      if (a == 0) { _____ 4
          x = x - 1 _____ 5
          print("value of x is:", x) — c
      }
      else if (a > 0) { — 7
          wait(NULL) — 8
          x = x + 1 _____ 9
          print("value of x is:", x) — i
      }
```

5

Print

value of  $x$  is 0  
value of  $x$  is 2



⑥

main: ————— 1

x = 1 ————— 2

a = fork() ————— 3

if (a == 0) { ————— 4

print("Child") ————— 5

x = x - 1 ————— 6

}

else if (a > 0) { ————— 7

print("Parent") ————— 8

x = x + 1 ————— 9

wait(NULL) ————— 10

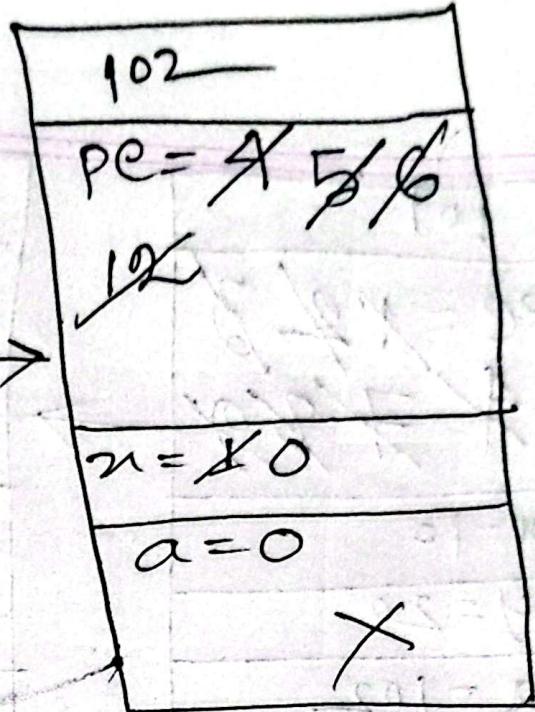
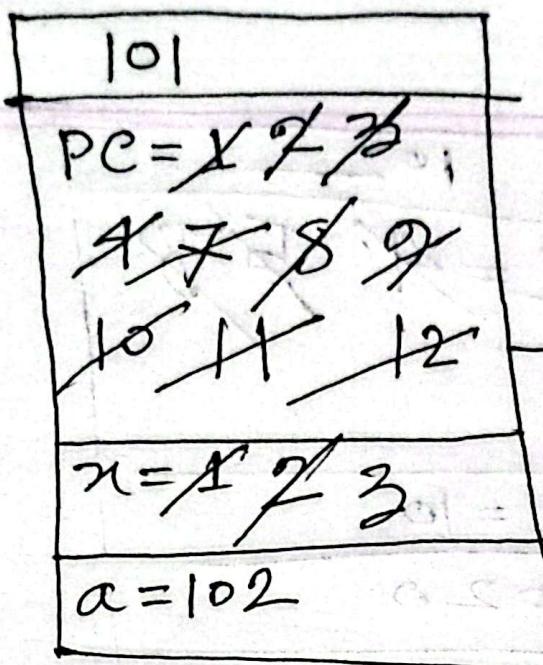
x = x + 1 ————— 11

}

print("value of x is:", x)

12

(6)



~~Point:~~

Parent  
Child  
value of  $n$  is 0  
value of  $n$  is 3

⑧

1. Print ("Hello");
2. ~~x = 10 ; y = 20 ;~~
3. a = ~~fork();~~
4. if (a == 0);
5. print ("Hi");
6. else
7. print ("Bye")
8. b = ~~fork();~~
9. if (b == 0);
10. Print ("No")

PCB<sub>1</sub>

P_id = p1
PC = <del>X 2 3 A B</del> <del>Y 8 9 10</del>
x = 10
y = 20
a = 103
b = 105

PCB<sub>2</sub>

P_id = 103
PC = <del>4 5 6 7 8 9</del> <sup>10</sup>
x = 10
y = 20
a = 0
b = 107

↓ PCB<sub>3</sub>

P_id = 105
PC = <del>9 10</del>
x = 10
y = 20
a = 103
b = 0

↓ PCB<sub>4</sub>

P_id = 107
PC = <del>9 10</del>
x = 10
y = 20
a = 0
b = 0

Print:

Hello

Bye

Hi

No

No

↓ PCB<sub>1</sub>

↓ PCB<sub>1</sub>

↓ PCB<sub>2</sub>

↓ PCB<sub>3</sub>

↓ PCB<sub>4</sub>

(A)

```
main() {  
    x=15.0; —————— 1  
    y=11.5; —————— 2  
    z=5.25; —————— 3  
  
    a=fork(); —————— 5  
    if (a==0) { —————— 6  
        x=(x+y)-z; —————— 7  
        y=(x-y)+z; —————— 8  
        z=x+y+z; —————— 9  
        b=fork(); —————— 10  
  
        if (b>0) { —————— 11  
            print("Child Starts\n"); —————— 12  
            wait(); —————— 13  
            x=x+y; —————— 14  
            y=y+z; —————— 15  
            z=x+z; —————— 16  
        }  
        else { —————— 17  
    }  
        printf("Grand Child Starts\n"); —————— 18  
        x=x+y; —————— 19  
        y=y+z; —————— 20  
        z=x+z; —————— 21  
    }  
    else { —————— 22  
        printf("Parent Starts\n"); —————— 23  
        wait(); —————— 24  
        x=x*y; —————— 25  
        y=x/y; —————— 26  
        z=(z*y)/x; —————— 27  
    }  
  
    printf("x = %lf\n",x); —————— 28  
    printf("y = %lf\n",y); —————— 29  
    printf("z = %lf\n",z); —————— 30  
  
    return 0; —————— 31  
}
```



PCB<sub>1</sub>

101
$PC = \cancel{1} \cancel{2} \cancel{3} 4$
$\cancel{5} \cancel{6} \cancel{7} \cancel{8} \cancel{9} \cancel{10}$
$\cancel{2} \cancel{4} \cancel{2} \cancel{5} \cancel{2} \cancel{6}$
$\cancel{2} \cancel{8} \cancel{2} \cancel{9} \cancel{2} \cancel{0} \cancel{2} \cancel{1}$
$a = 15.0 \ 172.5$
$y = 11.5 \ 15$
$z = 5.250.456$
$a = 102$
use

PCB<sub>2</sub>

102
$PC = \cancel{6} \cancel{7} \cancel{8} \cancel{9} \cancel{10}$
$\cancel{1} \cancel{2} \cancel{3} \cancel{4} \cancel{14}$
$\cancel{5} \cancel{15} \cancel{28} \cancel{2} \cancel{9} \cancel{30}$
$\cancel{3} \cancel{1}$
$a = 15.0 \ 31.25 \ 36.25$
$y = 11.5 \ 15 \ 56.5$
$z = 5.254.15 \ 77.75$
$a = 0$
$b = 103$

Point:

Parent starts  
 Child starts  
 Grand Child starts

36.25

56.5

77.75

36.25

56.5

77.75

172.5

15

0.456

PCB<sub>3</sub>

103
$PC = \cancel{1} \cancel{2} \cancel{3} \cancel{4} \cancel{5} \cancel{6} \cancel{7} \cancel{8} \cancel{9} \cancel{10} \cancel{11} \cancel{12} \cancel{13} \cancel{14} \cancel{15} \cancel{16} \cancel{17} \cancel{18} \cancel{19} \cancel{20} \cancel{21} \cancel{22} \cancel{23} \cancel{24} \cancel{25} \cancel{26} \cancel{27} \cancel{28} \cancel{29} \cancel{30} \cancel{31} \cancel{32} \cancel{33} \cancel{34} \cancel{35} \cancel{36} \cancel{37} \cancel{38} \cancel{39} \cancel{40} \cancel{41} \cancel{42} \cancel{43} \cancel{44} \cancel{45} \cancel{46} \cancel{47} \cancel{48} \cancel{49} \cancel{50} \cancel{51} \cancel{52} \cancel{53} \cancel{54} \cancel{55} \cancel{56} \cancel{57} \cancel{58} \cancel{59} \cancel{60} \cancel{61} \cancel{62} \cancel{63} \cancel{64} \cancel{65} \cancel{66} \cancel{67} \cancel{68} \cancel{69} \cancel{70} \cancel{71} \cancel{72} \cancel{73} \cancel{74} \cancel{75} \cancel{76} \cancel{77} \cancel{78} \cancel{79} \cancel{80} \cancel{81} \cancel{82} \cancel{83} \cancel{84} \cancel{85} \cancel{86} \cancel{87} \cancel{88} \cancel{89} \cancel{90} \cancel{91} \cancel{92} \cancel{93} \cancel{94} \cancel{95} \cancel{96} \cancel{97} \cancel{98} \cancel{99} \cancel{100}$
$a = 21.25 \ 36.25$
$y = 15 \ 56.5$
$z = 41.5 \ 77.75$
$a = 0$
$b = 0$