5.4 a.

FCFS:
| P₁ | P₂ | P₃ | P₄ | P₅ |

$$| P_1 | P_2 | P_3 | P_4 | P_5 |$$

FCFS
0 2 3   11   15   20

SJF:
| P₂ | P₁ | P₄ | P₅ | P₃ |

SJF
0 1 3 7 12 20

non-preemptive priority:
| P₃ | P₅ | P₁ | P₄ | P₂ |

non-preemptive priority
0   8   13 15   19 20

RR:
| P₁ | P₂ | P₃ | P₄ | P₅ | P₃ | P₄ | P₅ | P₃ | P₅ | P₅ | RR
0 2 3 5 7 9 11 13 15 17 19 20

| P₁ | P₂ | P₃ | P₄ | P₅ | P₃ | P₄ | P₅ | P₃ | P₅ | P₃ | RR
0 2 3 5 7 9 11 13 15 17 18 20

b. FCFS: P₁: 2ms   P₂: 3ms   P₃: 11ms   P₄: 15ms   P₅: 20ms
   SJF : P₁: 3ms   P₂: 1ms   P₃: 20ms   P₄: 7ms   P₅: 12ms
   n-pp: P₁: 15ms   P₂: 20ms   P₃: 8ms   P₄: 19ms   P₅: 13ms
   RR : P₁: 2ms   P₂: 3ms   P₃: 20ms   P₄: 13ms   P₅: 18ms

c. FCFS: P₁: 0   P₂: 2   P₃: 3   P₄: 11   P₅: 15
   SJF : P₁: 1   P₂: 0   P₃: 12   P₄: 3   P₅: 7
   n-pp: P₁: 13   P₂: 19 P₃: 0   P₄: 15   P₅: 18
   RR : P₁: 0   P₂: 2   P₃: 12   P₄: 9   P₅: 13 (ms)

d. FCFS: 6.2   SJF: 4.6   n-pp: 11   RR: 7.2

故 SJF 平均等待时长最短.

5.5 a.

P1	~~P1~~	Idle	P2	P3	P2	P3	P4	~~P4~~	P2	P3	Idle	P5	P6	P5

0   10   20   25   35   45   55 60   70   75 80   90 100 105   115 120
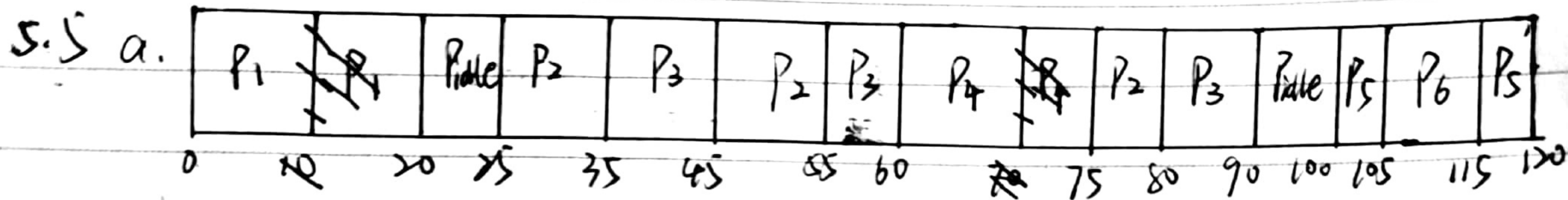
b. P_1: 20 P_2: 55 P_3: 60

P_4: 15 P_5: 120 P_6: 10

c. P_1: 0 P_2: 30 P_3: 35

P_4: 0 P_5: 10 P_6: 0
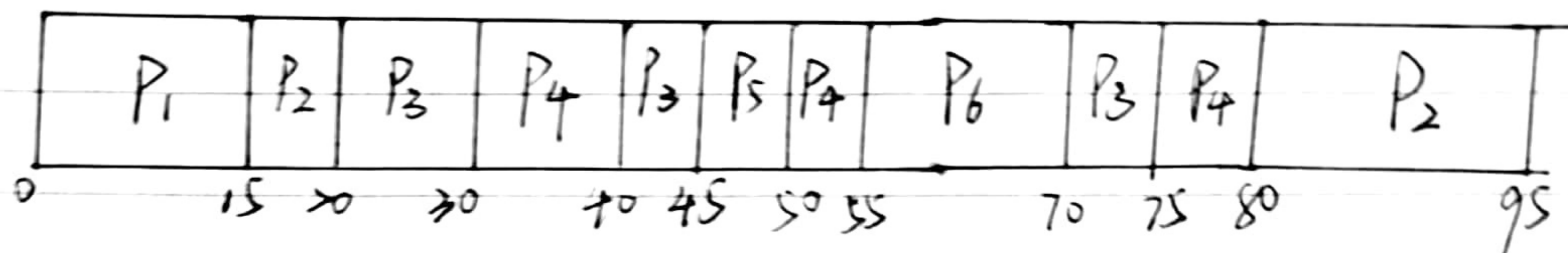
d. $\dfrac{105}{120} \times 100\% = 87.5\%$

5.10. P_1: $\dfrac{40}{2} + 60 = 80$

P_2: $\dfrac{18}{2} + 60 = 69$

P_3: $\dfrac{10}{2} + 60 = 60$

lower

S.18.

a.

| P₁ | P₂ | P₃ | P₄ | P₃ | P₅ | P₄ | P₆ | P₃ | P₄ | P₂ |

$$P_1 \quad P_2 \quad P_3 \quad P_4 \quad P_3 \quad P_5 \quad P_4 \quad P_6 \quad P_3 \quad P_4 \quad P_2$$

0   15 20 30   40 45 50 55   70 75 80   95

b. P_1 : 15 P_2 : 95 P_3 : 55

   P_4 : 55 P_5 : 5 P_6 : 15

c. P_1 : 0 P_2 : ~~80~~75 P_3 : 35

   P_4 : 35 P_3 : 0 P_6 : ~~15~~ 0

S.20.

b. 和 d.