1. Text, letter

   Description automatically generated  
   a.

A piece of paper with writing

Description automatically generated with medium confidence

b.

A piece of paper with writing on it

Description automatically generatedc.

A piece of paper with writing on it

Description automatically generated

1. The three requirements of the critical-section problem are mutual exclusion is assured, progress is assured, and bounded waiting is assured. Dekker’s algorithm satisfies all three of these requirements. When Pi is entering its critical section flag[i] will be true and turn == i so the code for Pj will spin in the while loop and not allow Pj to enter its critical section until Pi is finished therefore **mutual exclusion is assured.** After Pi has finished its critical section, it will set turn to j and flag[i] to false. Then Pj can enter its critical section, so **progress is assured.** Pj can enter its critical section after Pi has ran once so **bounded waiting is assured**.
2. A picture containing text, document

   Description automatically generatedText, letter

   Description automatically generated

A piece of paper with writing

Description automatically generated with medium confidence  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
Conclusion: The algorithm that makes the most efficient use of memory in this case is the best-fit algorithm because it is able to allocate memory for all 4 processes at the same time.

* 1. 2\*150ns = **300ns** because the paging system requires two memory accesses one for the page table and one for the data/instruction.
  2. Effective Memory Access Time = sa + (2-h)\*ma = 20ns + (2-0.8)\*150ns = 200ns

1. Text, letter

   Description automatically generated  
     
     
     
     
     
     
     
     
     
     
     
     
     
     
     
     
     
     
     
     
     
     
     
     
     
     
     
   Calendar

   Description automatically generated

Conclusion for question 5: FIFO -> 12 page faults, Optimal -> 7 page faults, LRU -> 9 page faults.