6.22 Consider the following queue of characters, where QUEUE is a circular...

6.22 Consider the following queue of characters, where
QUEUE is a circular array which is allocated six memory
cells: FRONT = 2, REAR = 4 QUEUE: ___, A, C, D, ___, ___
(For notational convenience, we use "___" to denote an empty memory cell.) Describe the queue as the following operations take place: (a) F is added to the queue.
(b) two letters are deleted.
(c) K, L and M are added to the queue.
(d) two letters are deleted.
(e) R is added to the queue.
(f) two letters are deleted.
(g) S is added to the queue.
(h) two letters are deleted.
(i) one letter is deleted.
(j) one letter is deleted.
(a) F is added to the rear of the queue, yielding
FRONT = 2, REAR = 5 QUEUE: ___, A, C, D, F, ___
Note that REAR is increased by 1.
(b) The two letters, A and C, are deleted, leaving
FRONT = 4, REAR = 5 QUEUE: ___, ___, ___, D, F, ___
Note that FRONT is increased by 2.

(c) K, L and M are added to the rear of the queue. Since K
is placed in the last memory cell of QUEUE, L and M are
placed in the first two memory cells. This yields FRONT
= 4, REAR = 2 QUEUE: L, M, ___, D, F, K
Note that REAR is increased by 3 but the arithmetic is modulo 6:
REAR = 5 + 3 = 8 = 2 (mod 6)
(d) The two front letters, D and F are deleted, leaving
FRONT = 6, REAR = 2 QUEUE: L, M, ___, ___, ___, K
(e) R is added to the rear of the queue, yielding
FRONT = 6, REAR = 3 QUEUE: L, M, R, ___, ___, K
(f) The two front letters, K and L, are deleted, leaving
FRONT = 2, REAR = 3 QUEUE: ___, M, R, ___, ___, ___
Note that FRONT is increased by 2 but the arithmetic is
modulo 6:
FRONT = 6 + 2 = 8 = 2 (mod 6)
(g) S is added to the rear of the queue, yielding
FRONT = 2, REAR = 4 QUEUE: ___, M, R, S, ___, ___
(h) The two front letters, M and R, are deleted, leaving
FRONT = 4, REAR = 4 QUEUE: ___, ___, ___, S, ___, ___
(i) The front letter S is deleted. Since FRONT = REAR, this
means that the queue is empty; hence we assign NULL